REPUBLIC OF INDONESIA
THE PROJECT FOR IMPROVING PLANNING CAPACITY FOR THE SEWERAGE SYSTEM IN DKI JAKARTA

Volume "Legal Framework"

Textbook for Working Group
"Establishment of Legal Framework for the Sewerage System"

May, 2017

JICA Consultant Team

Volume "Legal Framework"

Table of Contents

Part 1. Issue and circumstances of Sewerage in DKI Jakarta

1-1. SWOT analysis

Issues: Insufficient wastewater management strategy as well as limited resources of human and finance

Strong	Weakness
➢ World class Mega-city attracting human resources from whole Indonesia ➢ Stable growth and strong economic ➢ Experience of PD PAL Jaya	1. Insufficient sewerage development strategy 2. Limited time 3. Huge cost of project investment and O&M 4. Small task force of wastewater management 5. Limited experience on sewerage development as well as operation of large scale WWTP
Opportunity	**Threat**
➢ NCICD as driving force ➢ International event & tourist destination ➢ Merging with Water resource sector and Water supply sector	1. Policy change of sewerage development 2. Deficit of finance especially for O&M expense

1-2. Direction and solution of sewerage in DKI Jakarta

Solution: Synchronizing with well-designed development strategy and legal background.

First step: Apply BMP learned from oversea on Sewerage development strategy

- Obligation on Wastewater discharge to public sewer
- Notification of Sewerage service inauguration
- Tariff in accordance with Sewerage service type

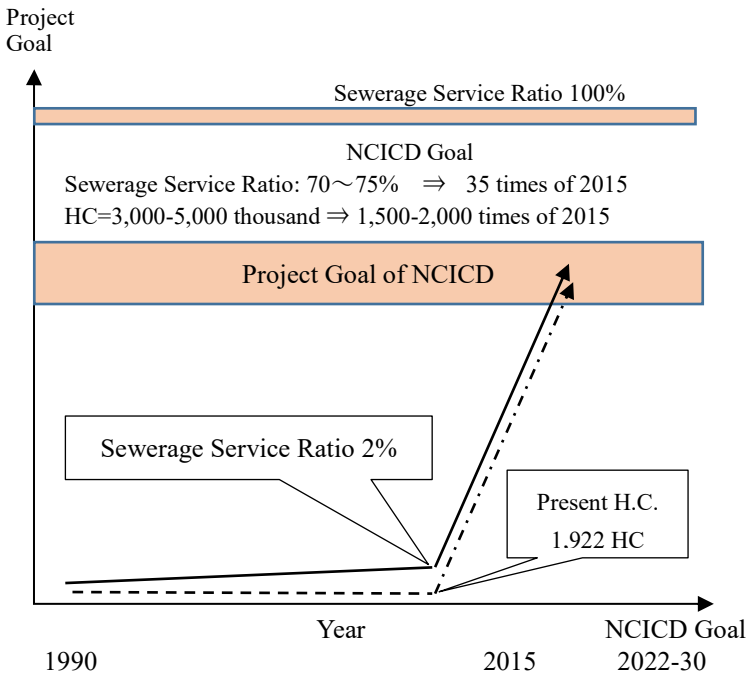
Second step: Draft institutional design, as a result, legal framework establishment

Issues	Concept of solution
Weakness 1. Insufficient sewerage development strategy 2. Limited time 3. Huge cost of project investment and O&M 4. Small task force of wastewater management 5. Limited experience on sewerage development as well as operation of large scale WWTP	1. Mid-term sewerage development plan 2. Focus on prioritized project based on step-wised development 3. Various financial source especially for investment and O&M expense 4. Well-trained staff and motivation as result of merging water supply sector 5. Learned from oversea (BMP: best management practice)
Threat 1. Policy change of sewerage development 2. Deficit of finance especially for O&M expense	1. Robust legal background especially for investment and O&M expenses 2. Careful design considering such affordability and balance of fairness “PPP: Pollutant-Pay-Principle”

1-3 Present Situation of House Connection and Wastewater Discharge

(1) Perspective House connection

Historical house connection manners is not sufficient for sewerage development policy.



Present Customer of P.D. PAL Jaya (Annual Report 2013)

No	Pelanggan/ Customer	Jumlah Pelanggan/Total Customer		
		Realisasi RKAP2012 /Actual2012(Audit)	RKAP 2013 /Plan 2013	Realisasi RKAP /Actual2013
1	Rumah Tangga/Residence	1,542	1,862	1,556
2	Niaga Kecil/Small commercial	129	124	167
3	Niaga Besar/Large commercial	157	173	167
4	Bangunan Social/Social	30	29	32
5	Industri/Industry	0	1	0
Jumlah/Total		**1,858**	**2,189**	**1,922**

(2) Existing Wastewater Discharge

Wastewater is discharged without treatment. Drainage is covered by green.

(3) Characteristics of Sewerage Area

Case 1: Individual house with discharging to sewerage system

Artificially developed residential complex with high-income as well as with awareness to environment sanitation.

Case 2: Individual house with almost discharging to existing channels

Naturally developed residences and various value on sewerage role.
A few residents appreciate sewerage role, however many owners of elegant premises are reluctant to connect sewerage due to sewerage charge.

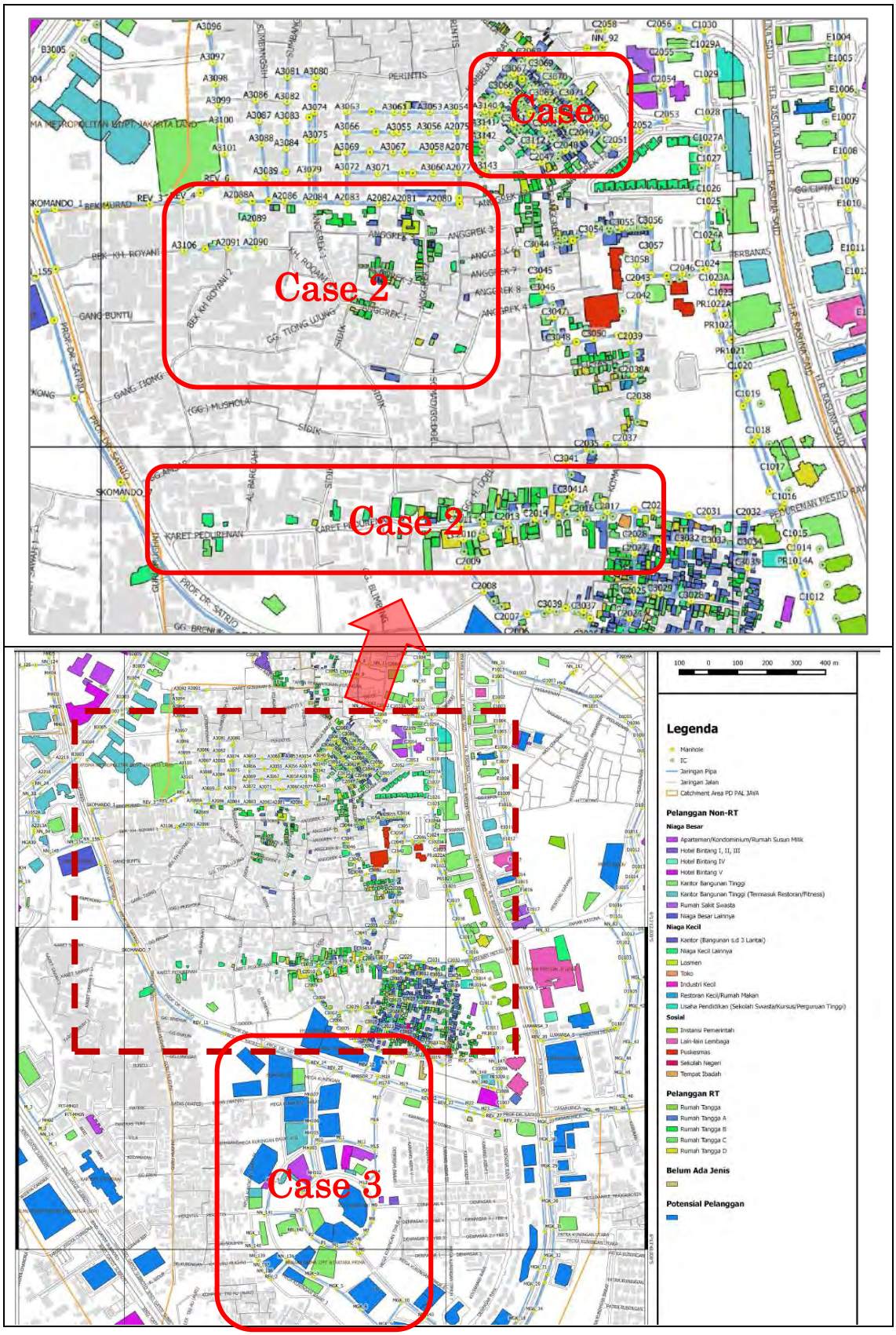
Case 3: Artificially developed business district with individual treatment plant, and will connect to public sewer

Artificially developed business center, however lack of coordination on sewerage development. Individual Treatment Plant wastes money.

Direction of solution:

(1) How to collect gray water which is major pollution source?
(2) How to speed up house connection?
(3) How to levy the wastewater discharger?

Sewerage Service Area: Keningan, Setia Budi



(4) Decree on Obligation of Wastewater Discharge

Issues: Stipulation has already promulgated, however lack of well-designed institution and business model attribute low wastewater collection rate.

The Greater Jakarta Governor Decree
No. 1040 of 1997

Regarding
Standard Quality of Sewerage Wastewater in the Greater Jakarta

"Article 5" does not work well.
Solution is practical institutional design.

The Greater Jakarta Governor
CHAPTER III CONTROL

Article 5
Each owners/inhabitants/responsibility bearers of the buildings as located within the service area of installed public wastewater pipeline canals shall dispose their wastewater into such public wastewater pipeline canals.

Article 6
Each owners/inhabitants/responsibility bearers of the buildings as stipulated under Article 5 above shall construct parcel wastewater channeling structure and connect properly to the public wastewater pipeline canals under supervision of PD PAL Jaya and related Government Services.

Article 7
Each owners/inhabitants/responsibility bearers of the buildings as stipulated under Articles 5 and 6 above and have been using the public wastewater pipeline canals shall observe the disposed wastewater quality to comply with the pipeline system wastewater quality standard in order to prevent from disturbances to the wastewater canals and other structures.

Practical institutional design is carefully

CHAPTER IV SUPERVISION AND MONITORING

Article 8

(1) Supervision and Monitoring against the Quality Standard of the Public Pipeline System Wastewater shall be executed by PD PAL Jaya.

(2) In execution of the supervision as stipulated under point (1) above of this Article, PD PAL Jaya shall coordinate with the related government services and report its supervision results to the Greater Jakarta Governor.

(3) The supervision task as stipulated under point (1) above of this Article include inter alia:
   a. monitoring and evaluation of quality standard of wastewater that enter into the pipeline system,
   b. collection and evaluation of data that relate to activities as stipulated under point a. above shall be executed by PD PAL Jaya.

(4) The supervision shall be conducted periodically and any time as required.

(5) If the results of the supervision and monitoring indicate quality standard deviation, the Government service in charge of guidance provision shall, on behalf of the Greater Jakarta Governor, request the owners/inhabitants/responsibility bearers of the buildings concerned to take needed measures and, if required, enforce penalties based on the pertaining provisions.

(6) Provisions on implementation procedure of the supervision and monitoring shall be established separately that include its implementation guidance and technical guidance

Ref: Stipulation of Oversea Law

Japan Sewerage Law

Article 9

Public Notice of Commencement of Sewerage Service

Municipal sewerage operator has to issue a public notice on the dates of commencement of new sewerage service, drainage/treatment area, and the others stipulated in the ordinance of sewerage while ensuring public access to the plans & sections in the offices of municipal governments.

Article 10

Mandatory Connection

10.1 Once sewerage service becomes available, land owners, tenants, or occupants **shall install house or lateral sewers** without delay by the following classification.

10.1.1 Where a land has a building, the building owner has the duty.

10.1.2 Where a land does not have a building, the land owner has the duty.

10.1.3 Where a land is public roads or used by other public authorities, the concerned authorities have the duty.

10.2 The repair & rehabilitation of house or lateral sewers shall be made by those who shall install them. The cleaning and other maintenance work shall be conducted by the occupants of the land.

10.3 The installation work & structure of house or lateral sewers shall comply with Building Law & the Order of Sewerage Law.

Singapore: SEWERAGE AND DRAINAGE ACT (CHAPTER 294)
(Original Enactment: Act 10 of 1999) REVISED EDITION 2001

Premises not provided with adequate sewerage system

6.

—(1) If it appears to the Board that any premises are not provided with an adequate sewerage system, the Board may, by notice in writing, require the owner or occupier of the premises to construct such sewerage system, or to make such alteration to the existing sewerage system as he considers necessary.

(2) The Board may, at any time by notice in writing, require the owner or occupier of any premises served by any sewerage system to make a sufficient drain-line emptying into any public sewer and to disconnect and demolish at his own expense any sewerage system rendered useless or unnecessary thereby.

(3) The Board may, by notice in writing, require the owner or occupier of any premises to cause all sewage from that premises to be discharged into such sewerage system as it may direct.

Malaysia: LAWS OF MALAYSIA Act 508

SEWERAGE SERVICES ACT 1993 *Incorporating all amendments up to 1 January 2006*

Requirement that proper drainage for sewage be made

17. (1) If any building is at any time not drained for sewage in accordance with this Act or any regulation made under this Act or otherwise to the satisfaction of the Director General by a sufficient private connection pipe communicating with a public sewer or public sewerage system, **the Director General may give notice in writing requiring the owner**, or if the owner cannot with reasonable diligence be traced the occupier, thereof to construct or lay from such building a pipe of such materials or size at such level and with such fall as the Director General thinks necessary for the draining of sewage from the building.

(2) If the owner or occupier fails to comply with a notice given under subsection (1) the Director General may apply to a Magistrate's Court for a mandatory order requiring the owner or occupier to construct or lay the pipe specified in the notice.
Queensland Sewerage and Water Supply Act 1949 **STANDARD SEWERAGE LAW** **15 Premises to connect to sewerage system** **The owner of premises in a local government's sewered area must make sure that—** (a) the soil or waste pipes from all fixtures on the premises, including water closet pans, urinals, sinks, baths, clothes washers and dishwashers, discharge into sanitary drainage; and (b) all sanitary drainage on the premises discharges to the local government's sewerage system for the sewered area. **16 Notice to connect to sewerage system or install on-site sewerage facility** **(1) A local government may, by written notice given to the owner of premises, require the owner—** **(a) to connect the premises to a sewerage system or common effluent drainage; or** (b) to install an on-site sewerage facility on the premises.
Taiwan: Sewerage Law 2007-01-03 **Chapter III. Use and Management** **Article 19** **The Sewer institution shall publicly announce the drainage area**, the date to start use, the connecting procedure and the sewerage management rule before the start use of the Sewers. Except otherwise permitted by the local competent authority, the Sewage within the drainage area shall be drained off in the Sewer subject to the public announcement. **Article 20** **The User shall be responsible for the management and maintenance of its own Drainage Facility.**

Part-2. Experiences of Oversea

2-1. Experience of Oversea

Experience of Over Sea Cities

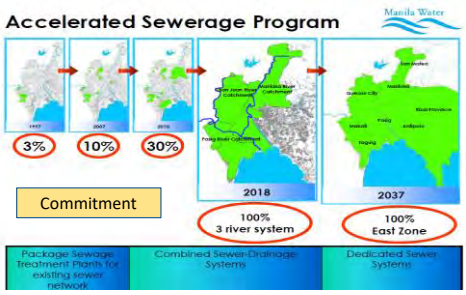
- Manila Water, Philippines
- PUB, Singapore
- IWK, Malaysia
- Kaohsiung, Taiwan-China
- Hong Kong, China
- Ho Chi Minh City, Vietnam

- Legal system for enhancing sewerage development
- References for Tariff and Finance

1

Policy Change in Manila, Philippines (1/5)

Practicable technology & Sewerage development plan in order to achieve Concessional Commitment



Operational Facilities (2013)

SEWERAGE	SEPTAGE
Number of STP: 37	Number of SpTP : 2
Total Capacity : >130 MLD	Total Capacity : 1.4 MLD
No of HH served : 127,639	Desludging Tankers: 77
Coverage : 13%**	HH desludged: 148,496

Total 390 MLD or 2.2 million population
On-going projects is 3times of existing facilities.

2

Policy Change in Manila, Philippines (2/5)
Small scale & separate sewer changed to Large scale & interceptor sewer

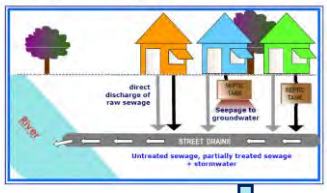
The Approach

1997 Concession Agreement Vision: Centralized STPs and Dedicated Sewer Systems

- Huge Investment = Higher Tariff
- Significant Construction Impact
- Customer Resistance (Water as a Priority)
- Difficulty in Securing Land

Decentralized Upgrade of Existing CSTs
Septage Management
Combined Sewer-Drainage Systems

Existing sanitation infrastructure for urban areas in the Philippines



(Combined Sewers)

Challenges

Source: Domestic Wastewater Management in Mega Manila: Partnership in Action, LWUA

- Water Act and to comply with the decision of the Supreme Court in the clean up and rehabilitation of Manila Bay
- Concessionaires shall implement the MWSS Master Plan to broaden and fast track the sewerage and sanitation services
- Implementation of a combined system for areas where separate system is not doable
- Due to land constraints, different technology options are being considered that will result in a smaller footprints
- Coordinated advocacies and policies towards behavioral changes on dumping of solid wastes

3

Policy Change in Manila (3/5) The Manila Bay

http://themanilabay.denr.gov.ph/supreme-court-decision/
On December 18, 2008,

The Supreme Court rendered a decision in G.R.No. 171947-48 ordering the defendant – government agencies, namely:

1. Metropolitan Manila Development Authority (MMDA)
2. Department of Environment and Natural Resources (DENR)
3. Department of Education (DepED)
4. Department of Health (DOH)
5. Department of Agriculture – Bureau of Fisheries and Aquatic Resources (DA/BFAR)
6. Department of Agriculture – Bureau of Soils and Water Management (DA/BSWM)
7. Department of Public Works and Highways (DPWH)
8. Department of Budget and Management (DBM)
9. Philippine Coast Guard (PCG)
10. Philippine National Police – Maritime Group (PNP- Maritime Group)
11. Department of Interior and Local Government (DILG)
12. Philippine Ports Authority (PPA)
13. Metropolitan Waterworks and Sewerage System (MWSS)
14. Local Water Utilities Administration (LWUA)

Supreme Court Order in 2008
Defendants are National & Local governments not Water Utilities .

Acting on the recommendation of the Manila Bay Advisory Committee, the Court hereby resolves to **ORDER** the following:

(1) The Department of Environment and Natural Resources (DENR), as lead agency in the *Philippine Clean Water Act of 2004*, shall submit to the Court on or before June 30, 2011 the updated *Operational Plan for the Manila Bay Coastal Strategy*.

(3) The MWSS shall submit to the Court on or before June 30, 2011 the list of areas in Metro Manila, Rizal and Cavite that do not have the necessary wastewater treatment facilities. Within the same period, the concessionaires of the MWSS shall submit their plans and projects for the construction of wastewater treatment facilities in all the aforesaid areas and the completion period for said facilities, which shall not go beyond 2037.

On or before June 30, 2011, the MWSS is further required to have its two concessionaires submit a report on the amount collected as sewerage fees in their respective areas of operation as of December 31, 2010.

4

Policy Change in Manila (4/5) Tariff Structure

NOTICE TO MANILA WATER CUSTOMERS AND THE PUBLIC NEW WATER RATES FOR THE EAST ZONE

MWSS — MANILA WATER

Effective January 1, 2016, Manila Water Company, Inc. (MWCI) will implement a -1.41% adjustment on the 2015 Basic Charge, based on MWSS Regulatory Office Resolution No. 2015-14-CA dated December 03, 2015 and as approved/confirmed by the MWSS Board Resolution No. 2015-147-RO dated December 10, 2015.

Manila Water Company, the East Zone concessionaire, covers the following areas: **Manila** (San Andres and Sta. Ana only), **Quezon City** (east of San Juan River, West Avenue, EDSA, Congressional and Mindanao Ave., Districts of Tandang Sora, Pasong Tamo and Matandang Balara), **Makati City** (east of South Super Highway), **Mandaluyong City, San Juan, Marikina City, Pasig City, Pateros, Taguig - all in Metro Manila; Rizal Province.**

The new schedule of water and sewer rates for all MWCI customers is as follows:

1. WATER CHARGE
A. BASIC CHARGE

RESIDENTIAL			Old Rate	New Rate
I. Low-income household				
Consuming 10 cu. m. or less			₱ 59.14 /conn.**	₱ 58.31 /conn.**
II. Consuming more than 10 cu. m.				
First	10	cu.m.	₱ 98.57 /conn.	₱ 97.18 /conn.
Next	10	cu.m.	12.02 /cu.m.	11.85 /cu.m.
Next	20	cu.m.	22.80 /cu.m.	22.47 /cu.m.
Next	20	cu.m.	30.03 /cu.m.	29.60 /cu.m.
Next	20	cu.m.	35.07 /cu.m.	34.58 /cu.m.
Next	20	cu.m.	36.75 /cu.m.	36.23 /cu.m.
Next	50	cu.m.	38.39 /cu.m.	37.85 /cu.m.
Next	50	cu.m.	40.03 /cu.m.	39.47 /cu.m.
Over	200	cu.m.	41.69 /cu.m.	41.10 /cu.m.

SEMI-BUSINESS			Old Rate	New Rate
First	10	cu.m.	₱ 98.57 /conn.	₱ 97.18 /conn. *
Next	10	cu.m.	20.12 /cu.m.	19.84 /cu.m.
Next	20	cu.m.	24.82 /cu.m.	24.47 /cu.m.
Next	20	cu.m.	31.53 /cu.m.	31.09 /cu.m.
Next	20	cu.m.	36.75 /cu.m.	36.23 /cu.m.
Next	20	cu.m.	38.39 /cu.m.	37.85 /cu.m.
Next	50	cu.m.	40.03 /cu.m.	39.47 /cu.m.
Next	50	cu.m.	41.69 /cu.m.	41.10 /cu.m.
Over	200	cu.m.	43.44 /cu.m.	42.83 /cu.m.

BUSINESS GROUP I			Old Rate	New Rate
First	10	cu.m.	₱ 447.95 /conn.	₱ 441.63 /conn.
Next	90	cu.m.	44.86 /cu.m.	44.22 /cu.m.
Next	100	cu.m.	45.10 /cu.m.	44.46 /cu.m.
Next	100	cu.m.	45.24 /cu.m.	44.60 /cu.m.
Next	100	cu.m.	45.35 /cu.m.	44.71 /cu.m.
Next	100	cu.m.	45.59 /cu.m.	44.95 /cu.m.
Next	100	cu.m.	45.72 /cu.m.	45.08 /cu.m.
Next	100	cu.m.	45.88 /cu.m.	45.23 /cu.m.
Next	100	cu.m.	46.14 /cu.m.	45.49 /cu.m.
Next	100	cu.m.	46.24 /cu.m.	45.59 /cu.m.
Next	100	cu.m.	46.37 /cu.m.	45.72 /cu.m.
Next	200	cu.m.	46.61 /cu.m.	45.95 /cu.m.
Next	200	cu.m.	46.74 /cu.m.	46.08 /cu.m.
Next	200	cu.m.	46.87 /cu.m.	46.21 /cu.m.
Next	200	cu.m.	47.13 /cu.m.	46.47 /cu.m.
Next	200	cu.m.	47.26 /cu.m.	46.59 /cu.m.
Next	500	cu.m.	47.39 /cu.m.	46.72 /cu.m.
Next	500	cu.m.	47.63 /cu.m.	46.96 /cu.m.
Next	500	cu.m.	47.76 /cu.m.	47.09 /cu.m.
Next	500	cu.m.	47.88 /cu.m.	47.20 /cu.m.
Next	500	cu.m.	48.14 /cu.m.	47.46 /cu.m.
Next	500	cu.m.	48.27 /cu.m.	47.59 /cu.m.
Next	500	cu.m.	48.40 /cu.m.	47.72 /cu.m.
Next	500	cu.m.	48.66 /cu.m.	47.97 /cu.m.
Next	500	cu.m.	48.77 /cu.m.	48.08 /cu.m.
Next	500	cu.m.	48.90 /cu.m.	48.21 /cu.m.
Next	500	cu.m.	49.03 /cu.m.	48.34 /cu.m.
Next	500	cu.m.	49.29 /cu.m.	48.60 /cu.m.
Next	500	cu.m.	49.41 /cu.m.	48.71 /cu.m.
Next	500	cu.m.	49.54 /cu.m.	48.84 /cu.m.
Next	500	cu.m.	49.79 /cu.m.	49.09 /cu.m.
Next	500	cu.m.	49.90 /cu.m.	49.20 /cu.m.
Over	10000	cu.m.	50.03 /cu.m.	49.32 /cu.m.

*Based on IRR-2005-03 dated 31 March 2008 and confirmed by MWSS BOT Res. No. 2008-064 dated 24 April 2008, the first 10 cubic meter of water consumed in Semi-Business

B. Foreign Currency Differential Adjustment (FCDA) - A percentage of the Basic Charge subject to periodic review and adjustment.
The FCDA for the 1st quarter of 2016 is 0.59% of the new Basic Charge.

2. A. ENVIRONMENTAL CHARGE (EC) - 20% of Water Charge applicable to all customers of MWCI

B. SEWERAGE CHARGE (SC)
0% of Water Charge for Residential and Semi Business
30% of Water Charge for Business Group I and II customers

3. MAINTENANCE SERVICE CHARGE

METER SIZE	AMOUNT (per conn.)
1/2" or 13mm	₱ 1.50
3/4" or 20mm	2.00
1" or 25mm	3.00
1 1/4" or 40mm	₱ 4.00
2" or 50mm	6.00
3" or 75mm	10.00
4" or 100mm	₱ 20.00
6" or 150mm	35.00
8" or 200mm	50.00

4. VALUE-ADDED TAX (VAT) 12% of the Charges 1, 2 and 3

THE MONTHLY BILL IS THE SUM OF 1, 2, 3, and 4.

Approved by:
JOEL C. YU, Chief Regulator, MWSS-RO

Approved by:
GERARDO A.I. ESQUIVEL, Administrator, MWSS

GERARDO C. ABLAZA JR., MWCI President

For further inquiries you may call Manila Water Company Hotline at 1627 or visit www.manilawater.com

4 Groups and Progressive Rate
- Residential
- Semi-Business
- Business I
- Business II

Cross Subsidy

3 types of charge
(Water Supply, Environmental Charge and Sewerage Charge for Commercial

5

Policy Change in Manila (5/5)

Jan. 2015

Next	500	cu.m.	51.14 /cu.m.	49.90 /cu.m.	Next	500 cu.m.	60.25 /cu.m.	58.79 /cu.m.
Over	10000	cu.m.	51.27 /cu.m.	50.03 /cu.m.	Over	10000 cu.m.	60.62 /cu.m.	59.15 /cu.m.

B. Foreign Currency Differential Adjustment (FCDA) - A percentage of the Basic Charge subject to periodic review and adjustment.
The FCDA for the 2nd quarter of 2015 is 0.18% of the new Basic Charge.

2. A. ENVIRONMENTAL CHARGE (EC) - 20% of Water Charge applicable to all customers of MWCI

B. SEWERAGE CHARGE (SC)
0% of Water Charge for Residential and Semi Business
30% of Water Charge for Business Group I and II customers

EC: 20% — SC: 0%

Jan. 2011

41.29 /cu.m.	45.08 /cu.m.	Next	500 cu.m.	48.43 /cu.m.	52.88 /cu.m.
41.38 /cu.m.	45.18 /cu.m.	Next	500 cu.m.	48.75 /cu.m.	53.23 /cu.m.
41.49 /cu.m.	45.30 /cu.m.	Over	10000 cu.m.	49.05 /cu.m.	53.56 /cu.m.

...1 March 2008 and confirmed by MWSS BOT Res. No. 2008-064 dated 24 April 2008, the first 10 cubic meter of water consumed in Semi-Business customers shall be billed at Residential Rate.

B. Foreign Currency Differential Adjustment (FCDA) - A percentage of the Basic Charge subject to periodic review and adjustment.
The FCDA for the 1st quarter of 2011 is 1.21% of the new Basic Charge.

2. A. ENVIRONMENTAL CHARGE (EC) - 18% of Water Charge applicable to all customers of MWCI

B. SEWERAGE CHARGE (SC)
10% of Water Charge for Residential and Semi Business
30% of Water Charge for Business Group I and II customers

3. MAINTENANCE SERVICE CHARGE

EC: 18% — SC: 10%

Jan. 2008

2. A. ENVIRONMENTAL CHARGE (EC)
12% of Water Charge

B. SEWERAGE CHARGE (SC)
40% of the Water Charge for Residential and Semi-Business customers connected to MWCI sewer lines
45% of the Water Charge for Business Group I & II customers connected to MWCI sewer lines

3. MAINTENANCE SERVICE CHARGE (MSC)

Meter Size	Amount (Peso/conn)
1/2" or 13mm	1.50
3/4" or 20mm	2.00
1" or 25mm	3.00
1 1/4" or 40mm	4.00
2" or 50mm	6.00
3" or 75mm	10.00

4. VALUE-ADDED TAX (VAT) 12% for the Charges 1, 2 and 3
THE MONTHLY BILL IS THE SUM OF 1, 2, 3 AND 4.

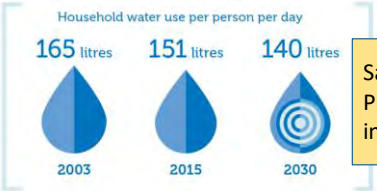
Approved By
ALBERTO C. AGRA, Officer-In-charge, MWSS RO
LORENZO H. JAMORA, MWSS Administrator

EC: 12% — SC: 40%

Increase revenue
Affordable & fair with low rate
- Environment charge : all customer
- Sewerage charge : connected to sewer

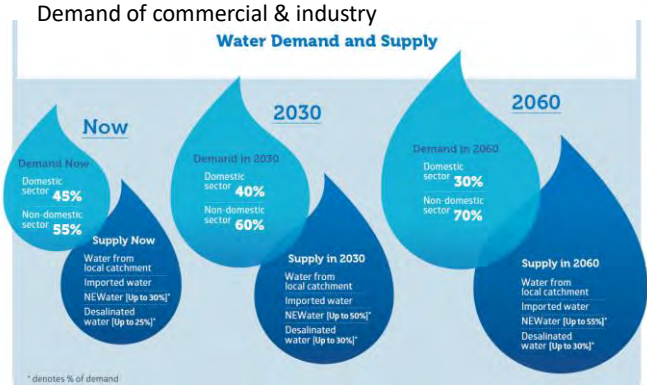
6

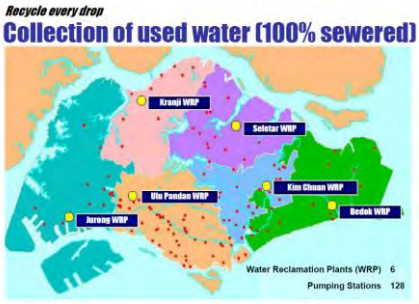
Public Utilities Board (PUB), Singapore (1/3)



Saving domestic water
Providing commerce & industry demand

Four Water:
Imported, Storm water, New water & Desalination
Water demand increase to Double:
Demand of commercial & industry





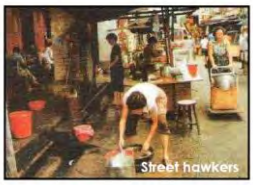
- Water resource for industry
- WW reclamation center
- Robust sewerage system
- 6 WWTP & 128 PS for urban development

7

Public Utilities Board (PUB), Singapore (2/3)

Historical change of water environment by sewerage system

Singapore Water
1960's



1970's

Dredging & improvement works...

Relocation of businesses & industries

Resettlement of squatters into proper public housing...

Laying of new sewers...

Unprotected catchments
In areas where development is limited to residential estates & industries with clean & light uses

Protected catchments
Located within the central nature reserve & development is not allowed

Catchment area – 2/3 of Singapore's land

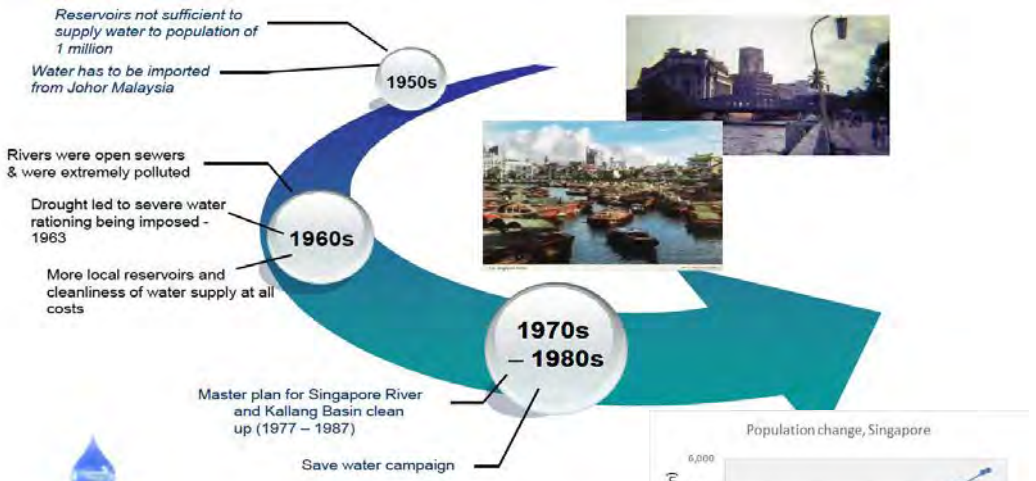
Urbanized catchments
In areas with multiple uses of land, i.e for housing, industry, commerce & transport

http://www.pub.gov.sg/privatesewer/index1.html

Flood control & storm water reservoir

8

Public Utilities Board (PUB), Singapore (3/3)

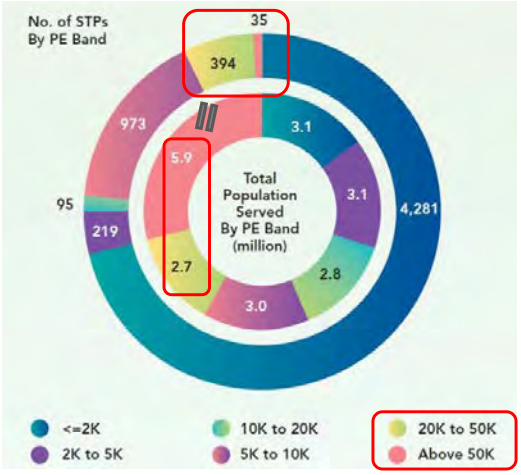


CWR
CENTRE FOR WATER RESEARCH

Source: Managing Water Beyond Limits, Lai Yoke Lee et al., National University of Singapore

Role of Sewerage
Population increase & Hub of commerce
Restricted water resource
⇒ **Water environment conservation**

IWK, Malaysia (1/3)

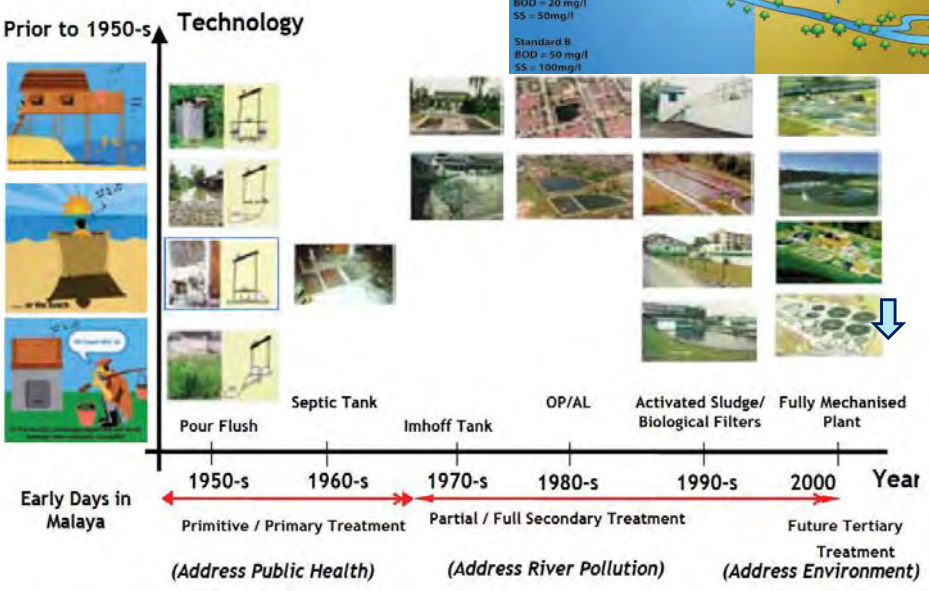


Desludging: Once per 2 years
Inside service area: 67,341 HH in 2013
Outside service area: 37,741 HH in 2013

Service Pop. : 21 million persons
Total WWTP: 5,997 plants.
Above 50,000 PE is 35 plants
Small STPs are integrated to large STP

IWK, Malaysia (2/3)

Serves 21 million PE of whole country & Various types of 6,000 WWTP with 3,236 staffs in 2013.



11

IWK, Malaysia (3/3)

Renovation & Integration of existing WWTP for complying with water environment regulation.

IndahWater

12

Kaohsiung City, Taiwan-China (1/2)

Step-wised Sewerage Development

Phase-1:
Phase-2:

Population change

WWTP Capacity
1st phase (1977-1986) 400,000 m^3/day
2nd phase (1991-2001): 750,000 m^3/day
3rd phase upward (2001-): 1,000,000 m^3/day
House connection rate: 52 % at end of 2014

13

Kaohsiung City, Taiwan-China (2/2)

Step-wised Sewerage Development focusing on sanitation/drainage & water environment

River revitalization project
- Home town & Amenity
- Tourist destination

Sewer facility exhibition “Outlet & Inceptor chamber”

Outlet & Inceptor chamber
(Motor-derived gate applied for inflow stop & flood control)

14

Ref. Step-wised Development of Sewerage System

Although settled sewerage and simplified sewerage are the technological building blocks for a low-cost system, it is important that they be reflected in all the stage of sewerage planning, facility planning, project implementation, institutional arrangements and financial planning, so as to heighten the cost-saving effect. The following elements are essential among others:

(1) Formulation of sewerage plan reflecting individual local conditions
(2) Formulation of staged construction plan
(3) Staged upgrading of wastewater treatment plant
(4) Selection of applicable technology (technical, social, cultural)
(5) Effective use of existing facilities
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Guideline refer Kaohsiung sewerage development strategy

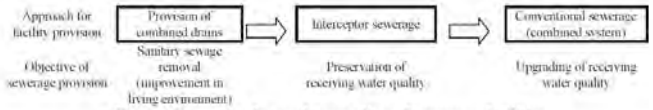


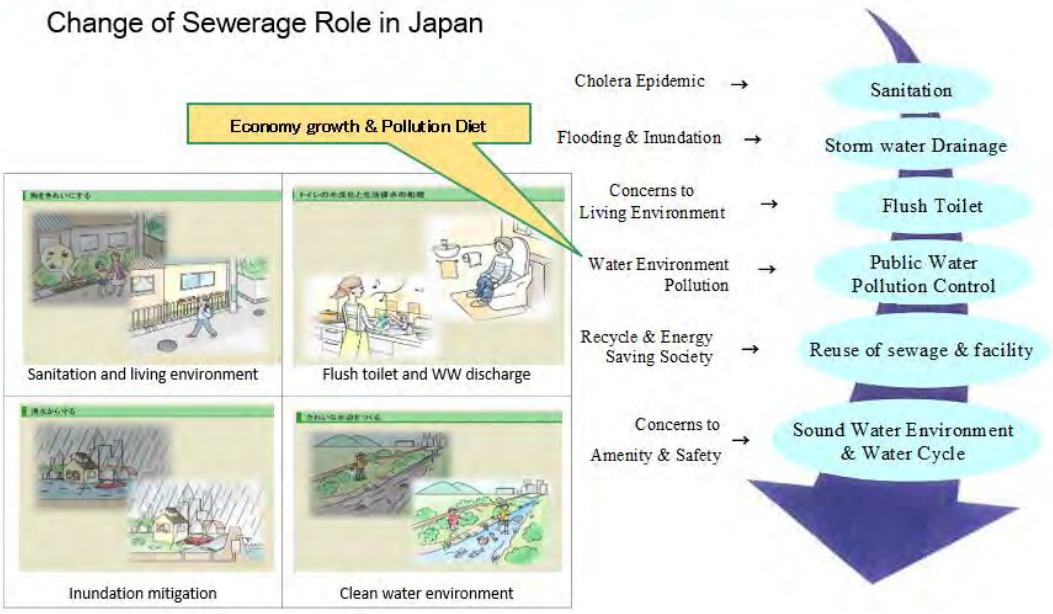
Fig. 2.4 Example of staged upgrading of sewerage facilities

【Manual & Guidelines】

(1) Guideline for Low-cost Sewerage Systems in Developing Countries, Infrastructure Development Institute-Japan
(2) Guidelines for Management of Sewerage Facilities in Developing Countries, Infrastructure Development Institute-Japan
(3) A Guideline for Upgrading or Rehabilitating Sewerage Systems in Developing Countries and Guidelines for Transfers of Related Technologies, Infrastructure Development Institute-Japan

15

Change of Role of Sewerage System



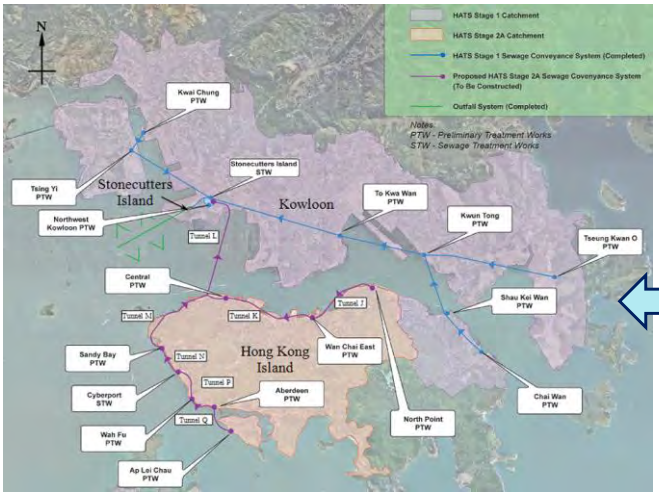
Principal Roles of Sewerage System

16

Hong Kong, China (1/2)

Integrating preliminary TP into cleaning up Harbor Area Treatment Scheme.

Cleaning up Victoria Harbor is important for the enhancement of the marine environment, public health, long-term leisure and amenity value of the coastal areas. The Government has been taking steps to protect this unique marine environment. Following the commissioning of Harbour Area Treatment Scheme (HATS) Stage 1 in 2001 and Stage 2A in 2015



- Preliminary / Screening
- Chemically Enhanced Primary Treatment
- Secondary Treatment

17

Hong Kong, China (2/2)

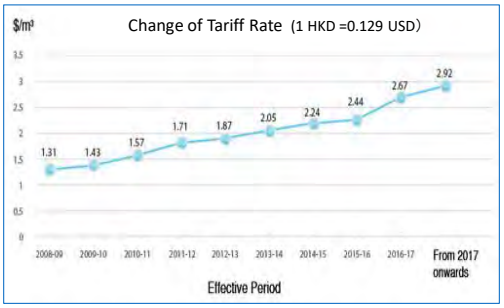
Tariff principle: Polluter Pay Principle for O&M cost and Gradual increase of sewerage charge

Sewage Services (Sewage Charge) Amendment Regulation 2007

To enhance **the "Polluter Pays" Principle** and to encourage the public to conserve valuable water, the Legislative Council has approved **a gradual increase of the sewage charge for 10 years** starting from 1 April 2008.
Since that day, the sewage charge rate was revised from the **original $1.20** to $1.31 per cubic metre of water supplied. The rate is and then gradually increased by **9.3 per cent per annum until reaching $2.92** per cubic metre on 1 April 2017.

1 HKD＝0.129USD
Source: Sustainability Report 2012-2013, Hong Kong Drainage Service Department

Revenue & Expenditure	Total	
	2012-13	2013-14
Revenue of Sewage Charge and Trade Effluent Surcharge ($M)	983	1,096
Expenditure **(excluding depreciation)** of Sewage Charge and Trade Effluent Surcharge ($M)	1,498	1,544
Operating Cost Recovery Rate (%)	65.6	69.0



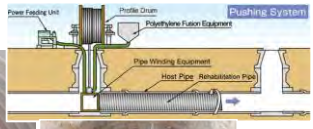
18

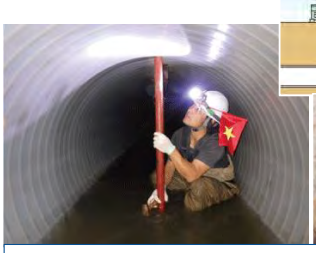
Ho Chi Minh City, Vietnam (1/2)

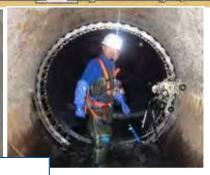
Modern WWTP with new trunk sewer and refurbising existing sewer.

Large scale WWTP

Microtunneling technology for congested road







Sewer rehabilitation technology

19

Ho Chi Minh City, Vietnam (2/2)

WW management project collaborating with transportation, flood mitigation, aesthetic and amenity.

River-bed deposit & squatter occupied

Construction & dredging

Present (Water front)

20

Legal system for enhancing sewerage development

21

Experienced Tariff System of Osaka, Japan

Osaka & Some Cities applied “Sanitary Charge” before prevailing water closet.

Tariff Structure of Osaka City, Japan in 1972 JPY = 0.004 USD (1972)

Category			Consumption (m^3 per month)	Old Tariff (JPY/m^3)	New Tariff (JPY/m^3)
General User (Gray water discharge)	Basic Charge	Individual house	8 m^3 or less	50	50
		Public bath	10 m^3 or less	70	70
		Communal use	8 m^3 or less	24	24
	Consuming charge	Individual house	Per 1 m^3	10	11-20 m^3/M 10 21-30 15 31-50 16 51-100 17 101- 18
		Public bath	Per 1 m^3	4.5	4.5
		Communal use	Per 1 m^3	3.9	3.9
Flush Toilet User	House hold	Closet bowl	Per unit	20	To be abolished
		Urinal lavatory	Per unit	10	
	Commercial	Closet bowl	Per unit	40	
		Urinal lavatory	Per unit	20	

Ref. : Present Tariff
3 category of “Residential, Commercial & Public bath”, Combined of WS & WW, and Progressive rate.

22

Notification of Sewerage Service Area (1/2)

Inauguration of Sewerage Service Area

Sewerage service area is notified for inauguration in order to regulate sewerage user.

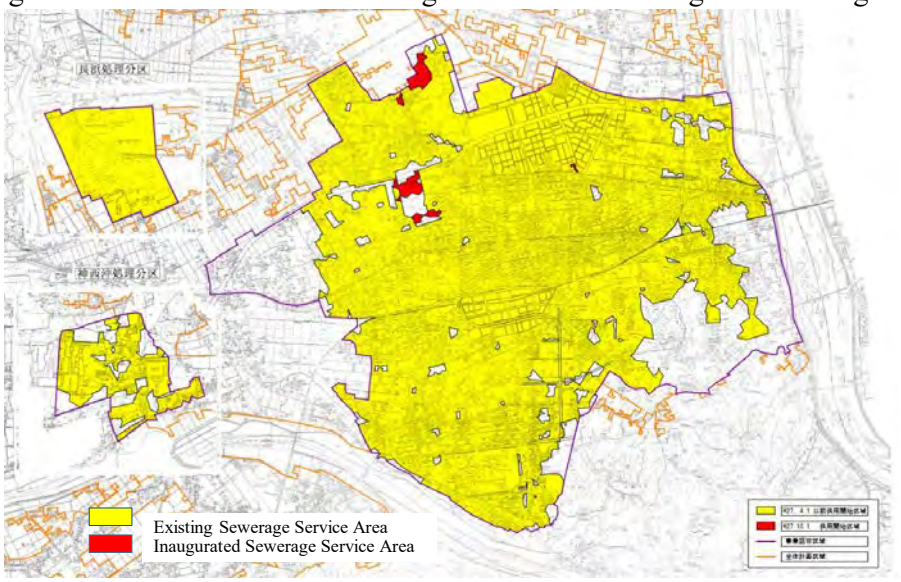


Figure- Notification of Sewerage Service Inauguration

23

Notification of Sewerage Service Area (2/2)

Recommendation to JKT

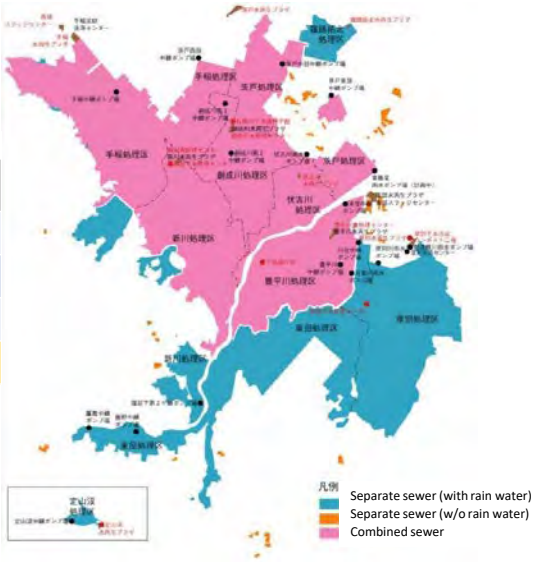
- Notify service type
- Tariff accordant with service type

Without septic tank cleansing service (Option-1)

Service type		Separate sewer	Interceptor sewer (Combined)
House connection	Gray water	Yes	Yes
	Black water	Yes	No (Septic tank)
Tariff	Gray water	Yes	Yes
	Black water	Yes	No

With septic tank cleansing service (Option-2)

Service type		Separate sewer	Interceptor sewer (Combined)
House connection	Gray water	Yes	Yes
	Black water	Yes	No (Septic tank)
Tariff	Gray water	Yes	Yes
	Black water	Yes	Yes

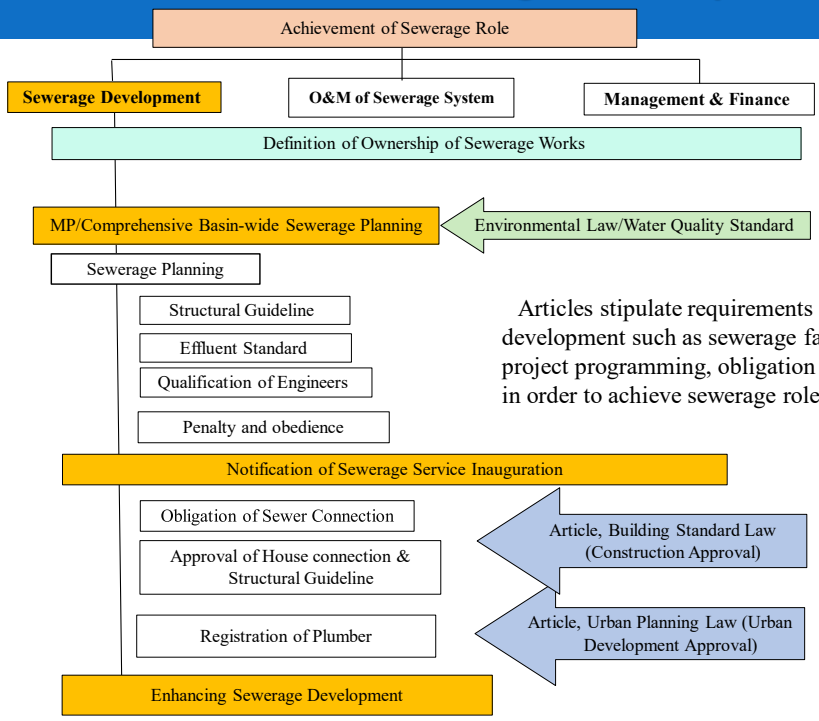


What type of tariff to be applied?

- Refer the experiences of Osaka, Singapore and Manila

24

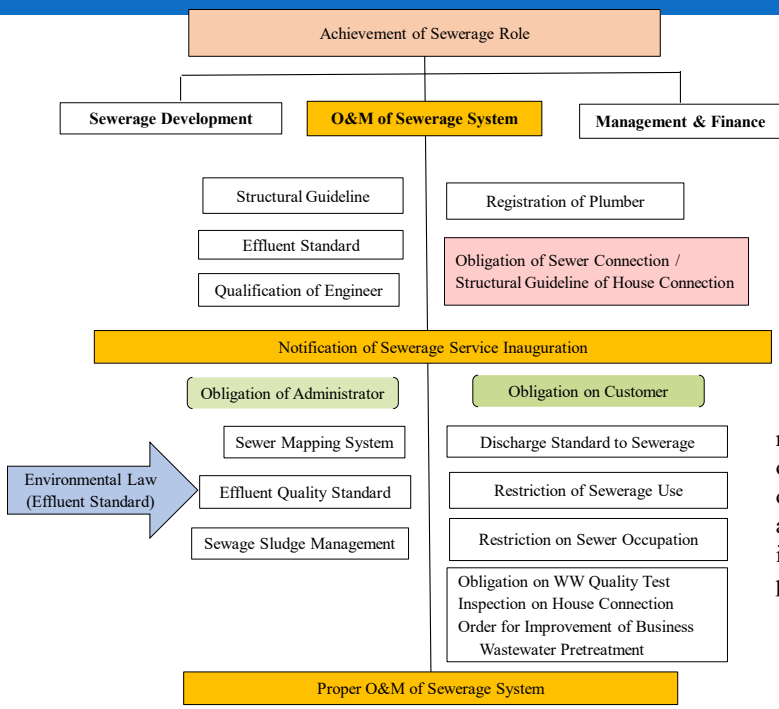
Articles related to Sewerage Development



Articles stipulate requirements for sewerage development such as sewerage facility planning, project programming, obligation of sewer connection in order to achieve sewerage role.

25

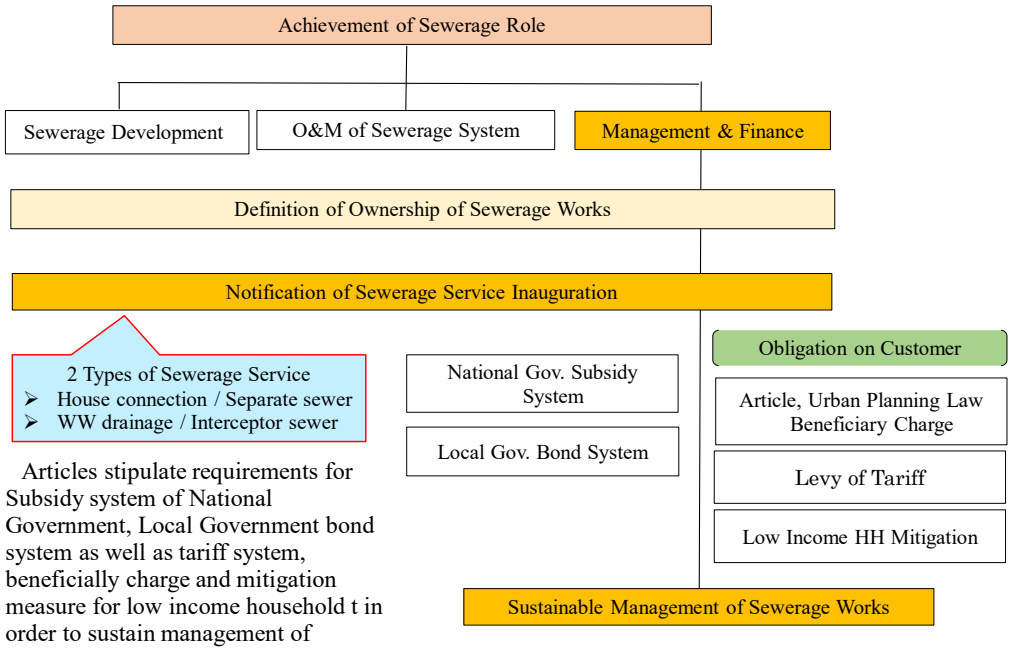
Articles related to O&M of Sewerage System



Articles stipulate requirements for structure of sewerage and others, obligation of administrator and obligation of customer in order to execute O&M properly.

26

Articles related to Sewerage Works Management



Articles stipulate requirements for Subsidy system of National Government, Local Government bond system as well as tariff system, beneficially charge and mitigation measure for low income household t in order to sustain management of sewerage works properly.

27

Recommendation to DKI Jakarta

- Leadership is a most for Water Environment Management with Legal background.
- Apply the BMPs in Oversea not to fail, which is to develop strategy plan using integration of existing facility, step-wised development, etc.
- Collaboration with Urban Infrastructure Development

Please remind “Jakarta is the last metropolitan city who is struggling with water environment restoration“.

28

References for Tariff and Finance

29

Conventional Sewerage Tariff in Japan

●Sewerage Service Charges (1 month): Right Table
※ The sewerage service charge is calculated by multiplying the figures in the above table by 1.08 (current consumption tax rate).
※ When not only tap water, but also well water is included in wastewater, the total figures in the above table are used to calculate the charge.

[Measuring wastewater discharge]
● Tap water
Wastewater is assumed to equal the amount of tap water used.
● Water other than tap water (i.e. well water)
A timer is placed on a water pump to record pumping time and calculate the amount of wastewater discharge.
※ Businesses whose wastewater amounts vary drastically from water use amounts (such as ice manufacturers) should consult with the Customers Service and Management Division of the Bureau of Sewerage at 03 (5320) 6573, or sewerage offices.

[Sewerage service charge exemptions]
Sewerage service charges are reduced in the following situations.
・Households living on public assistance.
・For public interest projects or in other special circumstances.

[Temporary Use]
When using the sewer system temporarily while performing construction, etc. the user must submit a notice for temporary usage. Please note that sewerage service charges will be applied for this usage.

Wastewater type	Volume (m^3)	Rate (Yen)
General wastewater	0~8m^3	560
	9~20m^3	110/m^3
	21~30m^3	140/m^3
	31~50m^3	170/m^3
	51~100m^3	200/m^3
	101~200m^3	230/m^3
	201~500m^3	270/m^3
	501~1,000m^3	310/m^3
	1,001m^3 and more	345/m^3
Public Bath wastewater	0~8m^3	280
	9m^3 and more	35/m^3

BOD & SS Tariff
Industrial wastewater discharger is obeyed to concentration of BOD & SS

30

Tariff System of Singapore (2/2)

Singapore applies "Water Conservation Tax & ""Sanitary Appliance Fee"

Tariff Category	Consumption Block (m^3 per month)	Water Tariff (SGD/m^3) [before GST]	Water Conservation Tax (% of Water tariff)[before GST]
Domestic	0 to 40	1.17	30
	Above 40	1.40	45
Non-Domestic	All units	1.17	30
Shipping	All units	1.92	30

Tariff Category	Consumption Block (m^3 per month)	Waterborne Fee (SGD/m^3)[after GST]	Sanitary Appliance Fee [after GST]
Domestic	All units	0.30	SGD 3.00 per chargeable fitting per month GST: Good & Service Tax (7%) SGD = 0.79 USD
Non-Domestic	All units	0.60	
Shipping	All units	0.60	

http://www.pub.gov.sg/general/Pages/WaterTariff.aspx

31

Tariff System of Singapore(2/2)

Singapore applies "Water Borne Fee" & "Sanitary Appliances Fee"

A1 : All homes, commercial and industrial premises, besides paying for the consumption water, also pay for the collection and treatment of used water. There are 2 components for used water charges:

(1) Sanitary Appliances Fee (SAF): A fixed fee of $3* for each sanitary fitting such as water closet, squatting pan, urinal or bidet.

(2) Waterborne Fee (WBF): A rate of $0.30* per m^3 (for home) or $0.60* per m^3 (for commercial and industrial premises) on the amount of water used.

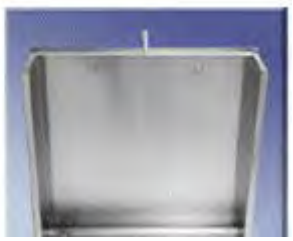
Toilet Bowl or Squatting Pan
($3* per bowl)

(1 bowl= 1 fitting)

Bidet Bowl
($3* per bowl)

(1 bowl= 1 fitting)

Urinal Bowl
($3* per bowl)
(1 bowl= 1 fitting)



Range/ Slab Urinal
($3* for every 610 mm length of slab and part thereof)
E.g.: 2m slab urinal= 4 fittings ($12)

http://www.pub.gov.sg/general/Pages/WaterTariff.aspx

32

		Current		From 1 July 2017		From 1 July 2018	
		Water Price ($/m³)		Water Price ($/m³)		Water Price ($/m³)	
		0 - 40m³	> 40m³	0 - 40m³	> 40m³	0 - 40m³	> 40m³
Potable Water	Tariff	$1.17	$1.40	$1.19	$1.46	$1.21	$1.52
	Water Conservation Tax (% of water tariff)	$0.35 (30% of $1.17)	$0.63 (45% of $1.40)	$0.42 (35% of $1.19)	$0.73 (50% of $1.46)	$0.61 (50% of $1.21)	$0.99 (65% of $1.52)
Used Water	Waterborne Fee	$0.28	$0.28	$0.78	$1.02	$0.92	$1.18
	Sanitary Appliance Fee	$2.80 per fitting*		Combined into Waterborne Fee		Combined into Waterborne Fee	
Total Price		$2.10	$2.61	$2.39	$3.21	$2.74	$3.69

Note: Water is charged per cubic metre (m³), which is equivalent to 1000 litres. All figures are before GST.
**For the calculation of total price, the Sanitary Appliance Fee is converted to its volumetric equivalent.*

Tariff rate is reviewed in accordance with costs for investment and operation. Two years raise mitigates impact on user. Fitting Charge (Sanitary Appliances Fees) is combined into Waterbone Fee.
Waterbone Fee (Sewerage charge) newly applly progressive tariff rate.

Amended Tariff in Singapore

Tariff System of Malaysia

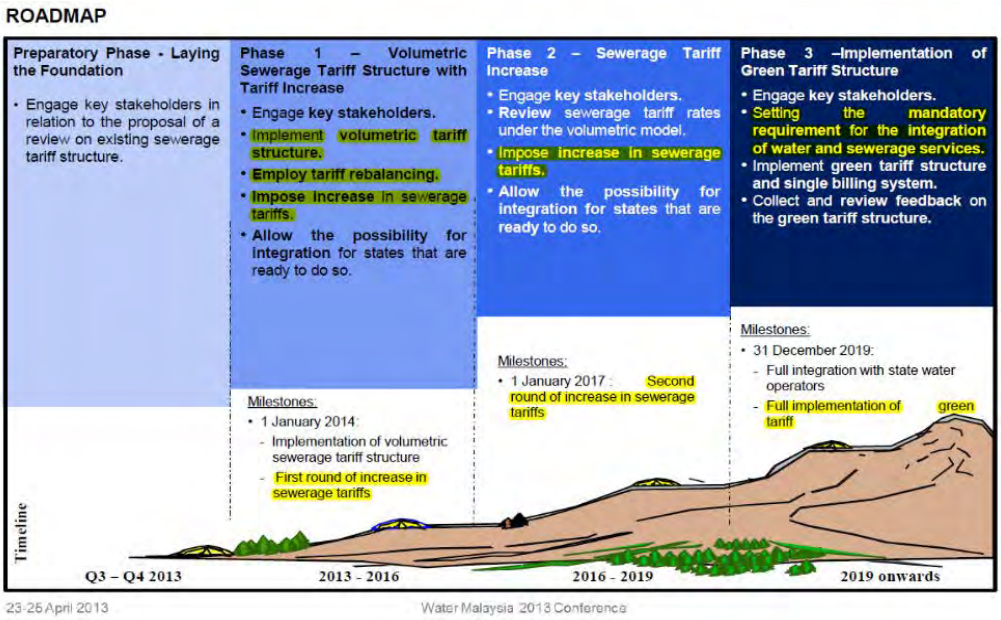
Malaysia IWK applies "Septic Tank Charge"

IWK will change to Combined Tariff with WS in order to increase collection rate

Category for Domestic	Monthly Charge(MYR) MYR = 0.33 USD
Low cost houses and government quarters in categories F, G, H and I (receiving either Individual Septic Tank or Connected Sewerage Services)	2.00
Houses in Kampung, New Villages and Estates (receiving either Individual Septic Tank or Connected Sewerage Services)	3.00
Premises and government quarters in categories A, B, C, D and E receiving Individual Septic Tank Services	6.00
Premises and government quarters in categories A, B, C, D, and E receiving Connected Sewerage Services	8.00

Monthly Basic Charge / Caj Asas Bulanan for Commercial			
Band Kumpulan	Annual Value (MYR) Nilai Tahunan (MYR)	Basic Charge (MYR) / Caj Asas (MYR)	
		Connected Bersambung	Septic Tank / Tangki Septik
1	0 - 2,000	8.00	7.00
2	2,001 - 5,000	14.00	8.00
3	5,001 - 10,000	20.00	14.00
4	10,001 - 20,000	26.00	19.00
20	5,000,001 - 7,000,000	9,200.00	6,000.00
21	More than/Melebihi 7,000,001	9,600.00	6,600.00

33



Tariff revenue rate is only 60% of expense because present tariff has not been amended since promulgation in 1997. Comprehensive refurbishment of tariff system is discussed. IWA proposes tariff system such as volumetic tariff accordant with water consumption, step-wised tariff increase, faire tariff system, affordability as well as integration with water and sewerage service in future.

Source: Charge for Sewerage Service, Water Malaysia 2013 Conference, IWK Malaysia

Road Map of Sewerage Tqriff in Malaysia

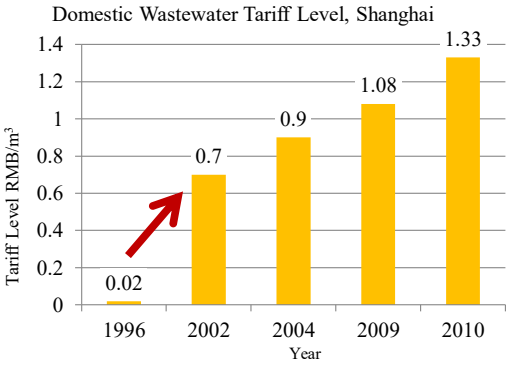
Tariff Amendment in Shanghai

Conciliating social acceptability & economics stability in tariffs

(1) Over past 20 years Shanghai has increased tariff from virtually zero to appropriate level, however still not enough to full cost recovery.

(2) Higher user charge & lower government subsidies mean that local government has more funds available for such as health, education, social services & public infrastructures that must be financed by government.

Source: Financing for Urban Development of Shanghai



Source: Sustainable Low-Carbon City Development in China, World Bank & Second Shanghai Sewerage Project, World Bank

Water supply & Wastewater Tariff Shanghai 2010 (RMB/m^3) RMB=0.16 USD

Group	Water supply	Wastewater	WW/WS
Industrial	2.00	1.80	0.90
Commercial/Institutional	2.00	1.70	0.85
Domestic	1.63	1.33	0.82

WS: Shanghai South Water Company
WW: Shanghai Municipal Sewerage Company

34

2-2. Step-wised sewerage development

Step-wised Development of Sewerage System

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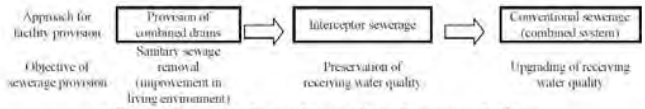

Fig. 2.4 Example of staged upgrading of sewerage facilities

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1

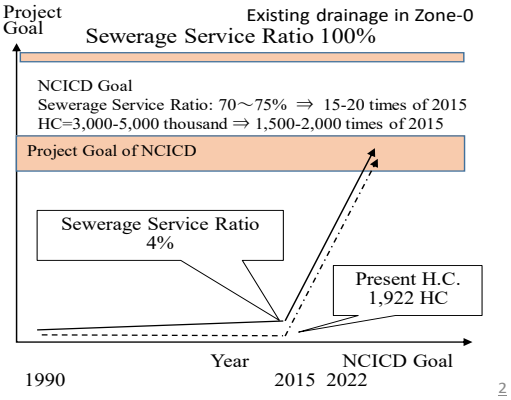
How to Implement Sewerage Project in Jakarta ?

Experience & Challenge of DKI JKT

Existing drainage in Zone-0

Present Customer of P.D. PAL Jaya

No	Pelanggan/ Customer	Jumlah Pelanggan/Total Customer		
		Realisasi RKAP2012 /Actual2012(Audit)	RKAP 2013 /Plan 2013	Realisasi RKAP /Actual2013
1	Rumah Tangga/Residence	1,542	1,862	1,556
2	Niaga Kecil/Small commercial	129	124	167
3	Niaga Besar/Large commercial	157	173	167
4	Bangunan Social/Social	30	29	32
5	Industri/Industry	0	1	0
Jumlah/Total		**1,858**	**2,189**	**1,922**



2

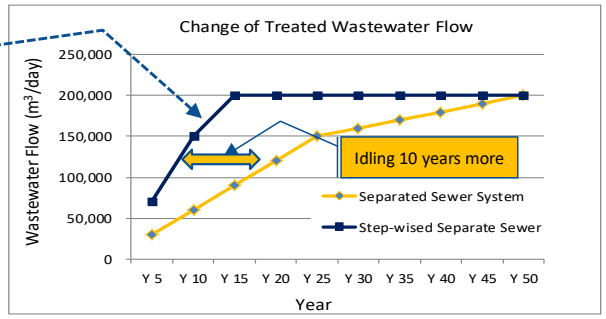
Step-wised Development of Sewerage System

Cost Factors for Step-wised Sewer vs. Full Separate Sewer

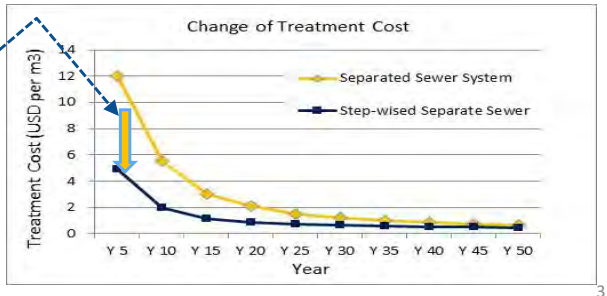
Rapid Increase of *Wastewater Collection*

Step-wised Sewer System
- Existing WW collected by trunk sewer

Separate Sewer System
- HC gradually increases accordant with public sewer inauguration.



Remarkable Improvement of *Cost Performance*



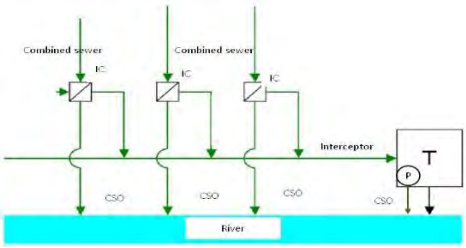
WW inflow rate affects WWTP cost
Cost/m³ = O&M cost/inflow rate (m³)

3

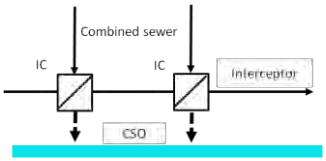
Wastewater Collection of Interceptor Sewer (Combined Sewer)

Interceptor sewer is a trunk sewer that intercepts wastewater at IC (interception chamber). IC diverts design flow to STP. Excess wastewater overflows to rivers, which is called CSO (combined sewer over flow). CSO is diluted wastewater with storm water.

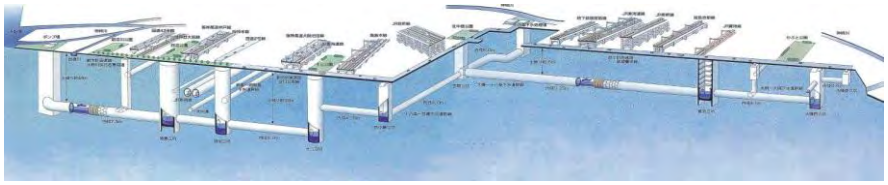
IC facilitates fixed weir and flow control used for CSO mitigation technology such as orifices, vortex valves and water surface control devices.



Good example

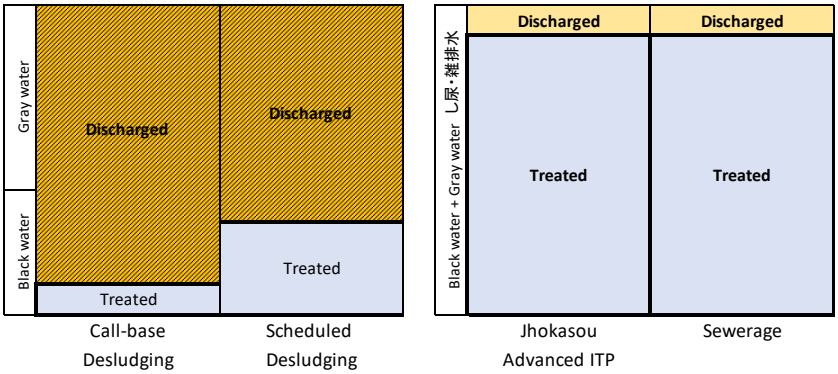


Bad Example



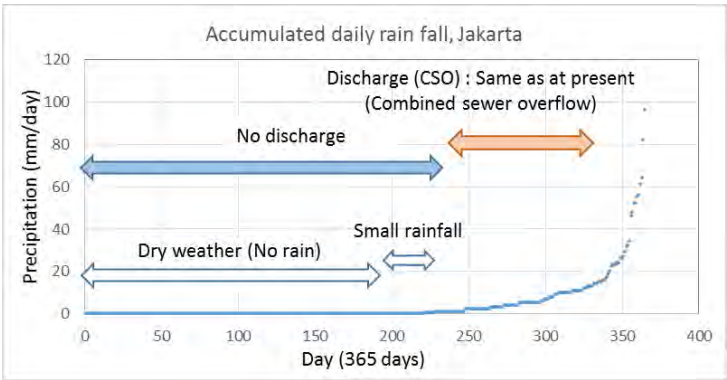
Lay-out Plan of Trunk Sewer (Interceptor Sewer)

BOD Removal and Overflow Mitigation byTretment System



Septic Tank: Only treats human waste (black water) and discharges gray water without treatment. Scheduled desludging enhances BOD removal efficiency due to preventing sludge spill out.
Jookasou and advanced ITP treat black water as well as gray water, and are almost same level of treatment efficiency as sewerage with 90 % removal rate.

Daily rain events in a year



Accumulated curve of precipitation

Source Weather History – Soekarno Hatta and JICA Study Team edited
Sewer and pum are designed for hourly wastewater flow collection with some allowance. This means sewer has stormwater collection capacity to some extent which is allocated to small rainfall.

Rainfall chacteristics in Jakarta

Existing water pollution

Existing drainage

Pumped drainage

Present Overflow in Dry weather

Dry weath	
Rain	

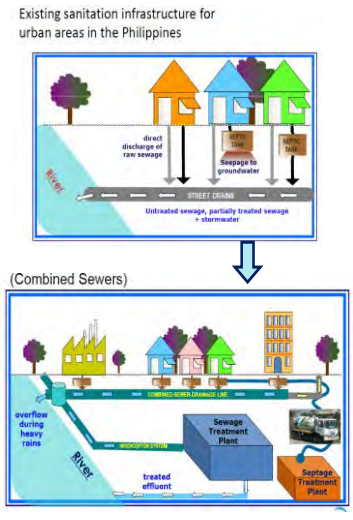
CSO: Cor

Sewerage s
eventhough
Wastewater
duration is

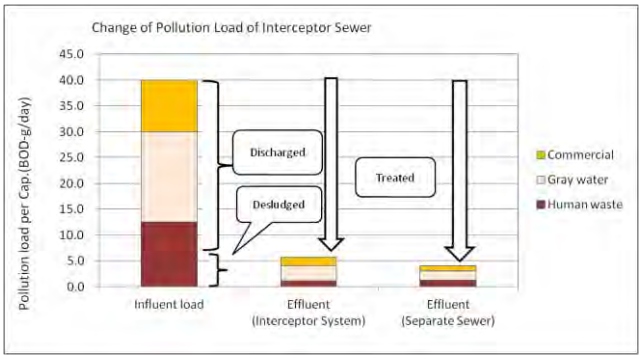
Accordingl

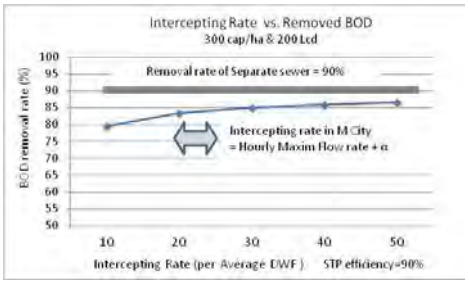
-
-

Source: Domestic Wastewater Management in Mega Manila: Partnership in Action, MWSS



Pollutant Reduction Efficiency of Interceptor Sewer (Combined Sewer)





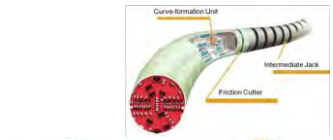
Annual BOD removal ratio by intercepted ratio (Sewer capacity: Approx. 2 times of Average DWF)

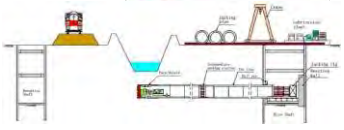
Interceptor sewers can collect approx. 80 to 85% of annual pollution.
Pollution load reduction of separate sewerage depends on treatment efficiency (approx. 90%). Interceptor sewerage is almost the same level in cities like Jakarta where wastewater treatment for improvement of water environment has high priority.

Category	Removal rate	Pollution load per capita			
		Domestic		Commercial (1/3 of Domestic)	Total
		Human waste	Gray water		
	%	g/cap	g/cap	g/cap	g/cap
Influent load	–	12.5	17.5	10.0	40.0
Estimated Effluent load Interceptor System	83%	1.1	3.0	1.7	5.8
Separate Sewer	90%	1.3	1.8	1.0	4.1

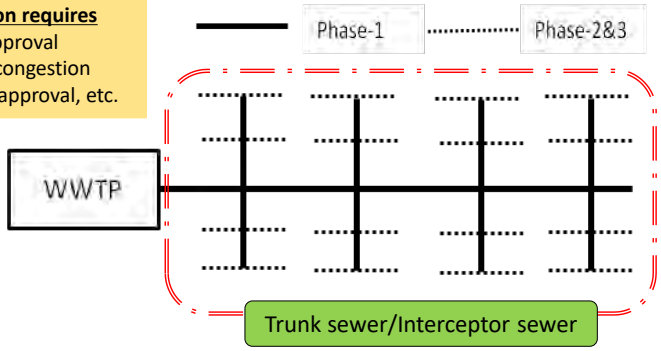
Features of Step-wised Sewerage Development (1/2)

Focus on Priority facilities & Tariff Collection
- Trunk Sewer for connecting whole service area
- WWTP for pollution control
- Sewerage charge on commercial & high income





Sewer construction requires
- Land occupation approval
- Solution on traffic congestion
- House Connection approval, etc.



4

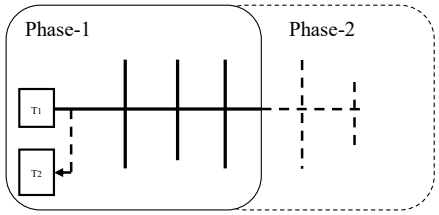
Features of Step-wised Sewerage Development (2/2)

Options for saving Investment Cost

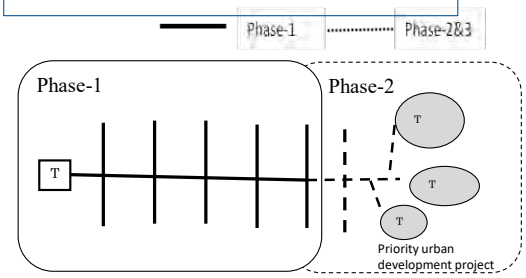
- Urbanization & Life style change increase WW flow
- Construction project requires many years

Idling capacity can be utilized

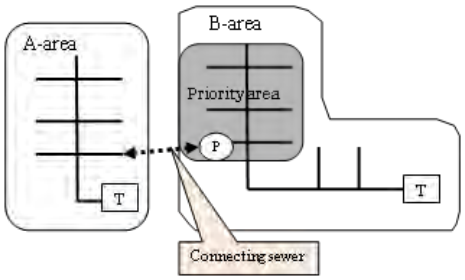
Phased WWTP Construction in case of strict land acquirement



Collaboration with urban development project



Temporal use of adjacent WWTP in case of strict trunk sewer construction



5

Sewerage System for Applicable Urban Development

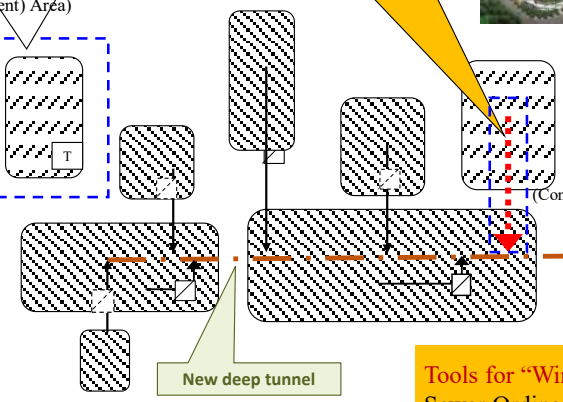
Business sector is expected to cross subsidy to low income class.

Construction & operated by developer or community obligated by Building Construction Code.
In future transfer to Sewerage Co.

(Individual Treatment) Area)

Construction by developer.
Transferred to and operated by Sewerage Company

Housing development area



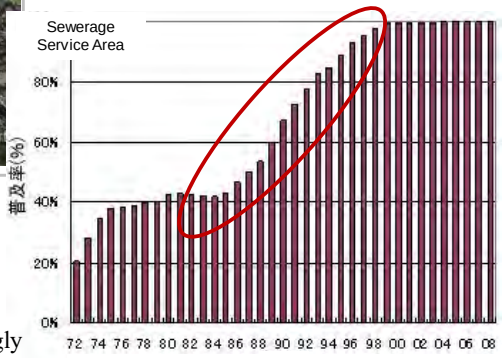
Combined sewerage
Separate sewerage
Combined sewer
Sanitary sewer (Separate system)
Diversion Chamber

Tools for "Win-Win Solution"
Sewer Ordinance defines
➢Building Construction Permission
➢Sewer Connection Obligation
➢Connection Charge

6

Collaboration with Urban Development Project

Urban Development provides Urban infrastructure
High-income customer for sustainable finance background



Change of sewerage service rate（N City）

Sewerage Development of Build-transfer（N City）

- Building Approval: Guiding sewer network
- Gov.: Focuses on Trunk sewer & WWTP
- Sewer constructed and transferred（Build-Transfer）
- 5 - 6 % Annual increase of sewerage area, accordingly achieved 100 % Coverage in 15 years.

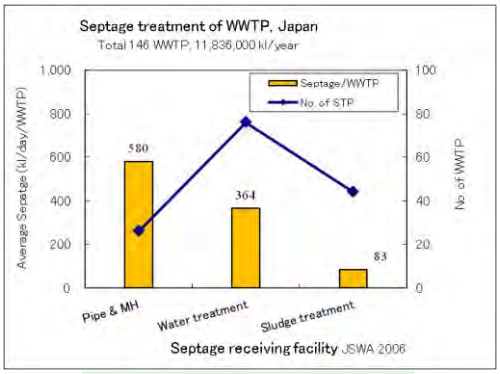
⇒ **Speed-up & Saving Gov. Budget**

7

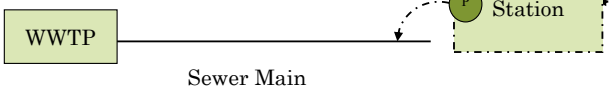
Septage Treatment Service

- Septage is decomposed, accordingly biological treatment is difficult.
- Dilution and separation in WWTP is practicable technically as well as financially.
- Receiving at sewer is more flexible and saves transportation time.

Truck scale

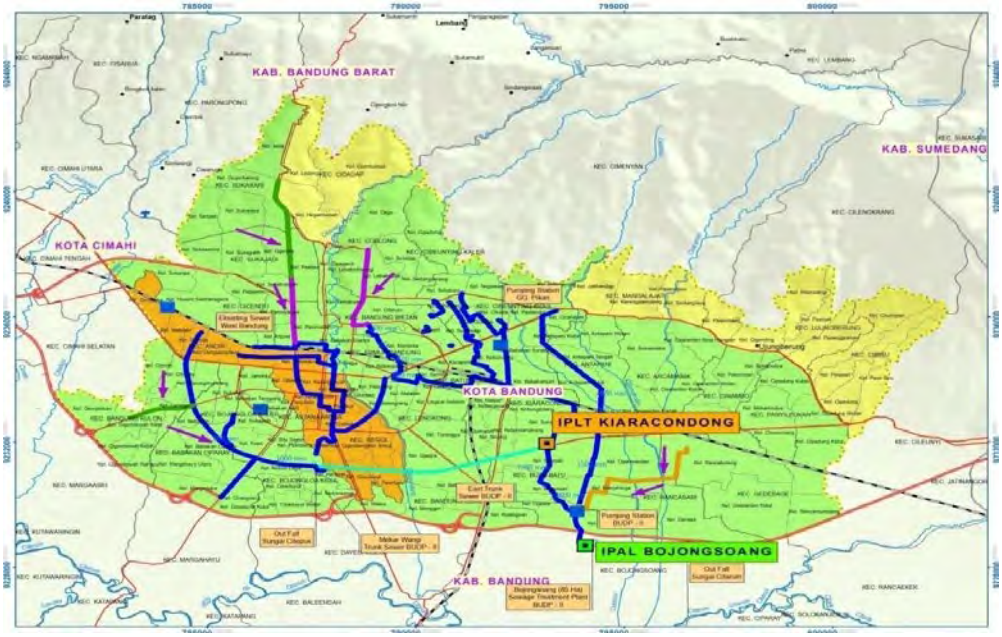


Lay-out Plan of Septage Treatment



8

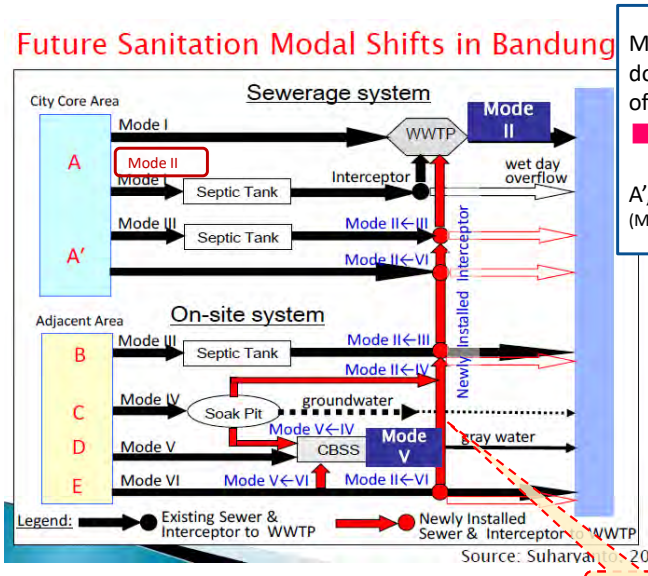
Strategy of Wastewater Management in Bandung (1/4)



9

Strategy of Wastewater Management in Bandung (2/4)

Existing sewerage & drainage systems are integrated to wastewater treatment system through newly installed sewer & interceptor.



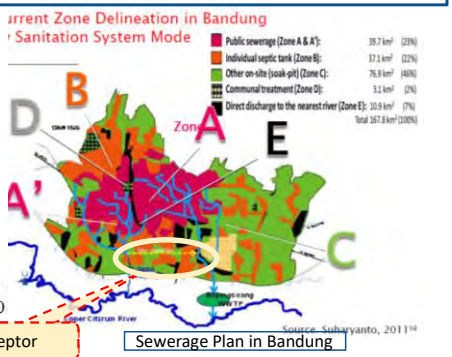
Source: International Conference on Sustainability Science in Asia 2012, Prayatni Soewondo & Marisa Handajani ITB

Major pollutant in Indonesia comes from domestic wastewater and contributes 70 % of organic load in urban river.

■ Zone A &A' : Existing Sewerage mostly combined and partially separated.

A', covers west area, serves without WWTP.

(Metropolitan Bandung Urban Development Program)



Interceptor

Sewerage Plan in Bandung

10

Strategy of Wastewater Management in Bandung (3/4)

Concept of Wastewater Management
- Commitment of Development strategy
- Define sewerage service type
- Utilize existing facility
- Collaborating with private company

Domestic Waste Water Management System of Bandung City

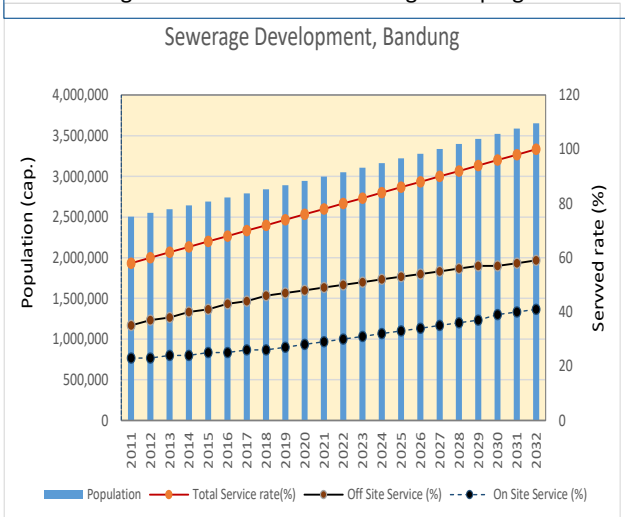
1. Off – Site System (Target 43%)
a.Construction of Secondary and Tertiary Pipe Network in several area that has not yet serve with piping network.
b.Adding more House Connection (HC) in area where there are piping network.
c.Expansion for coverage area , also to Bandung Regency area with piping network of PDAM.
d.Increasing capacity of WWTP and revitalization of WWTP Bojongsoang

2. On – Site System (Target 34%)
a.Add more sludge truck periodically to improve service
b.Provide Communal Septic Tank for area that are not covered by piping system.
c.Improving partnership with private sector for Sludge Truck for improving service
d.Construction of Sludge Treatment Plant for final treatment for On-Site System

11

Strategy of Wastewater Management in Bandung (4/4)

Development Plan of Wastewater Management
- Steady increase (2% per year) of sewerage service in spite of population increase
- Well-designed demarcation of sewerage & septage service



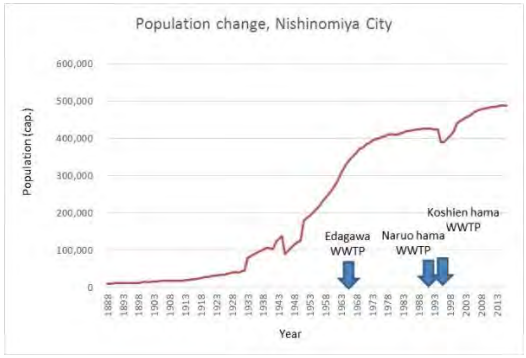
Year	Population(person)	Total Service (%)	Off Site Service (%)	On Site Service (%)	Total Person Served (person)
2011	2,505,586	58	35	23	1,211,200
2012	2,550,937	60	37	23	1,293,119
2013	2,597,109	62	38	24	1,377,172
2014	2,644,116	64	40	24	1,463,534
2015	2,691,975	66	41	25	1,552,389
2016	2,740,700	68	43	25	1,643,925
2017	2,790,306	70	44	26	1,738,337
2018	2,840,811	72	46	26	1,835,824
2019	2,892,230	74	47	27	1,936,593
2020	2,944,579	76	48	28	2,040,858
2021	2,997,876	78	49	29	2,148,838
2022	3,052,137	80	50	30	2,260,759
2023	3,107,381	82	51	31	2,376,855
2024	3,163,625	84	52	32	2,497,366
2025	3,220,886	86	53	33	2,622,541
2026	3,279,184	88	54	34	2,752,635
2027	3,338,538	90	55	35	2,887,911
2028	3,398,965	92	56	36	3,028,640
2029	3,460,486	94	57	37	3,175,103
2030	3,523,121	96	57	39	3,327,587
2031	3,586,890	98	58	40	3,486,388
2032	3,651,812	100	59	41	3,651,812

12

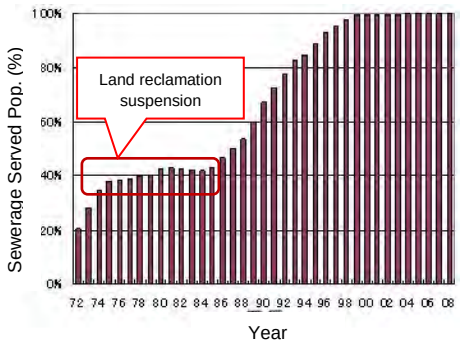
2-3. Case Study: Step-wised Sewerage Development in Nishinomiya City

(i) Background-1: Urbanization & Population Increase

Suspended land reclamation project due to resident's opposition affected sewerage project implementation.

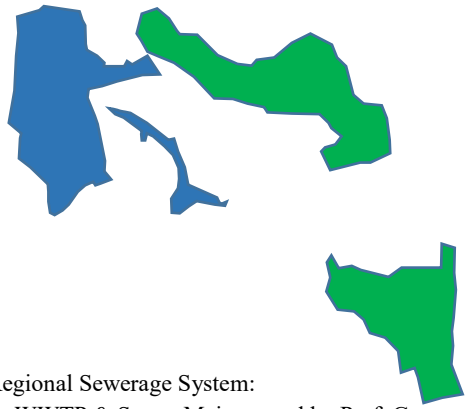


Change of Population （N City）

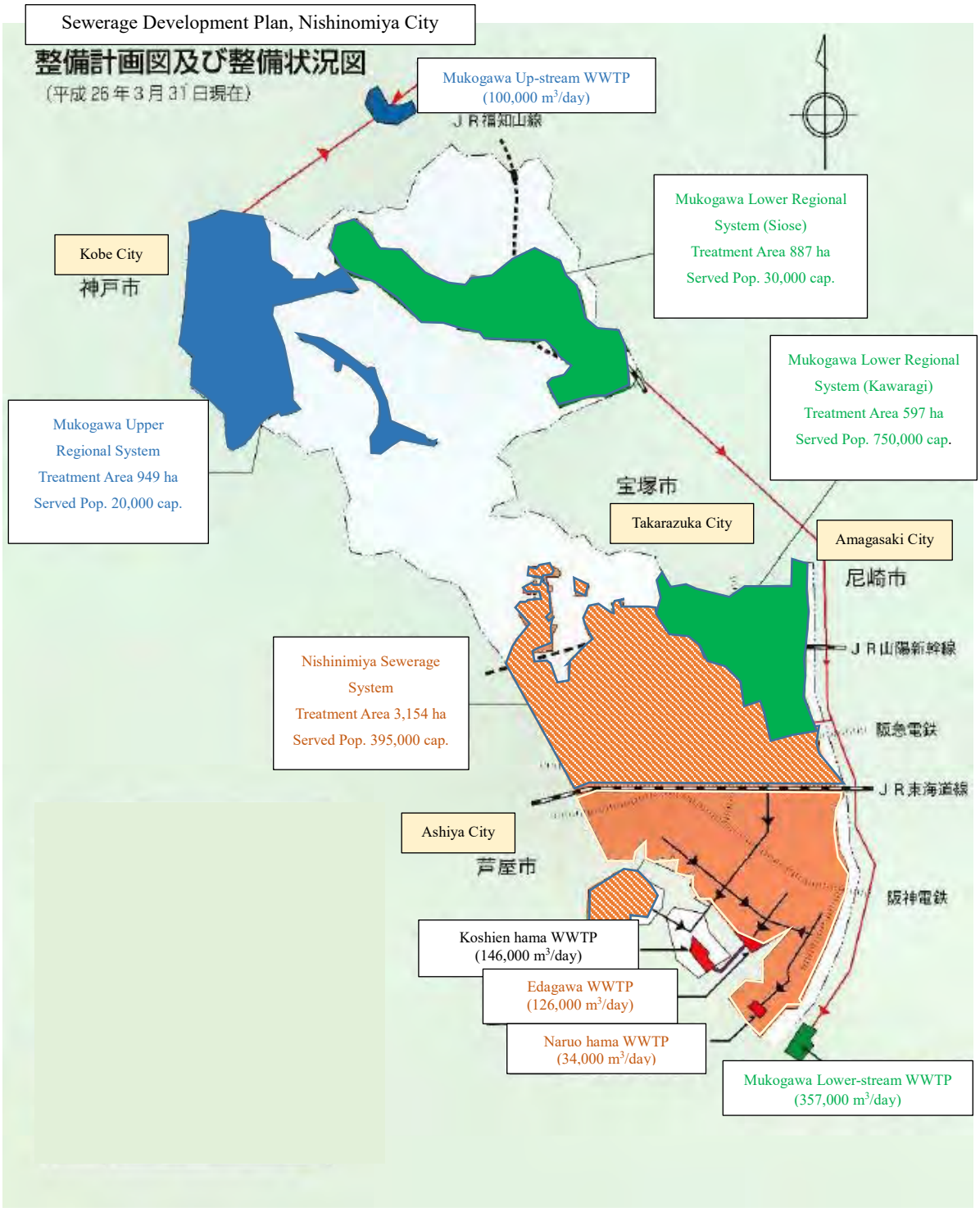


Change of sewerage service rate （N City）

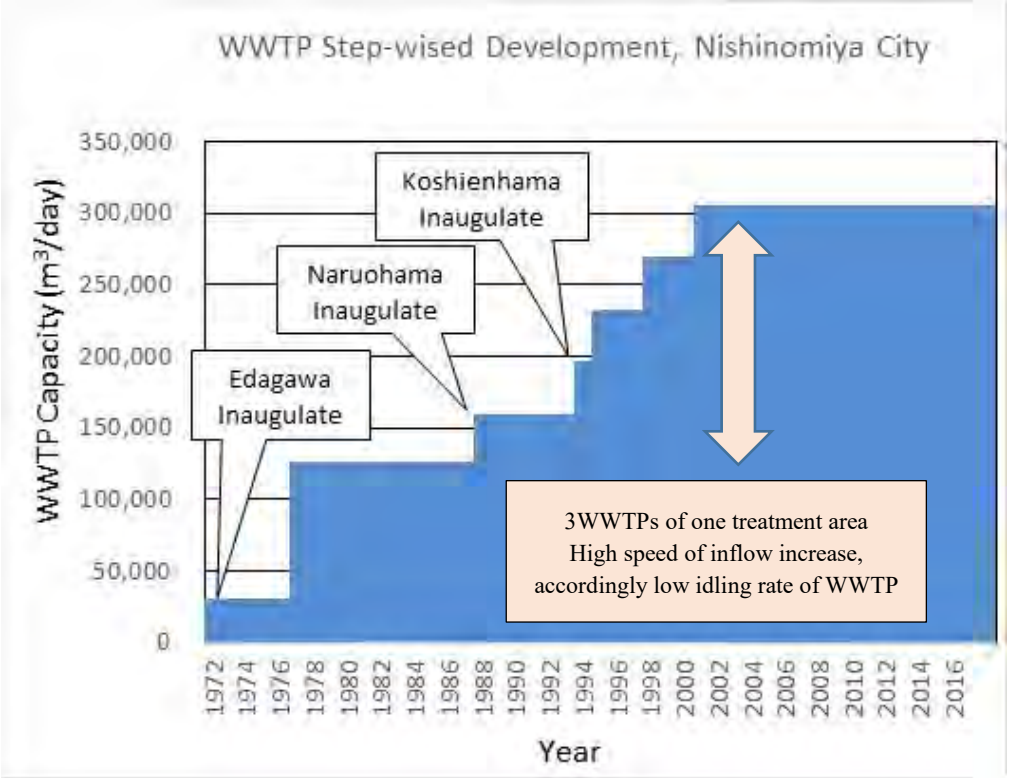
⇒ Acquisition of WWTP Treatment Site

Land reclamation	Regional Sewerage System
	 Regional Sewerage System: WWTP & Sewer Main owned by Pref. Gov., and secondary through service sewer owned by Municipal Gov.

(Reference) Sewerage Layout Plan



(ii) Step-wised WWTP Development



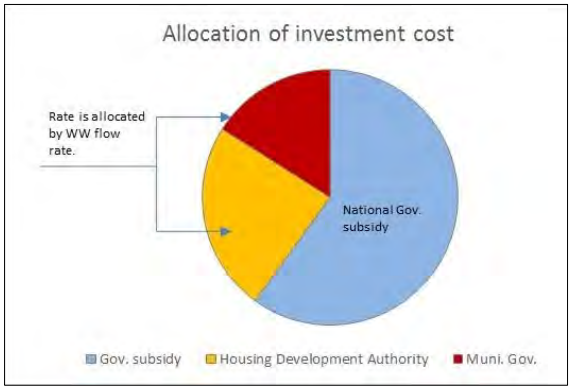
WWTP	Phasing	Project Capacity Plant Work (m^3/day)	Project Capacity-Civil Work (m^3/day)	Accumulated Capacity (m^3/day)
Edagawa	Phase-1	31,500	31500	31,500
Edagawa	Phase-2	94,500	94,500	126,000
Naruohama		34,000	34,000	160,000
Koshienhama	Phase-1	36,500	73,000	196,500
Koshienhama	Phase-2	36,500	—	233,000
Koshienhama	Phase-3	36,500	73,000	269,500
Koshienhama	Phase-4	36,500	—	306,000

Figure Step-wised WWTP Development

(iii) Project Implementation Support-1 “New Town Project”

Trunk sewer, which connects WWTP and New town, is financed by beneficially receipting organization. Investment cost is allocated by the wastewater flow rate produced in New town and existing urban area.

Sewer in New Town is financed by Developer. National Government Subsidy is applied.



(iv) Project Implementation Support-2 “Housing Development Project”

Developer constructs sewer, which is transferred to Government with free charge.

Legal Background

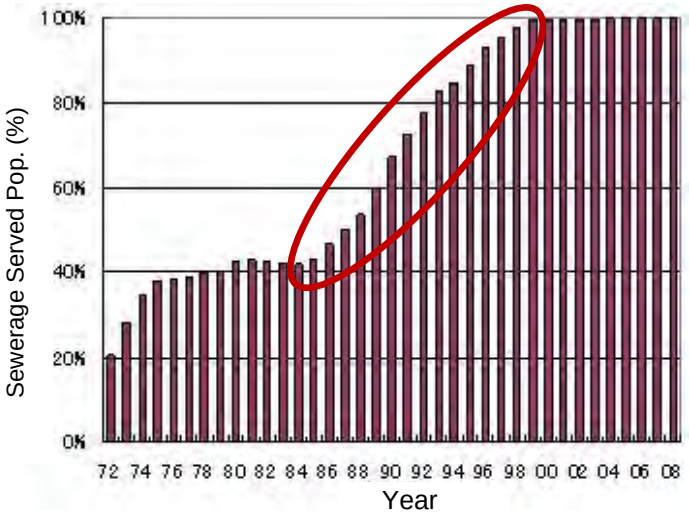
- Sewerage Law on “Obligation of Sewer Connection
- Urban Planning Law on “Urban Development Approval”
- Building Standard Law on “Construction Approval”

(v) Project Implementation Support-3 “Land Reclamation Project”

Design-Build and Transfer of “Sea reclaim project” develops WWTP and sewer, and transfer to Gov. with free of charge.

(vi) Effects of Project Implementation Support

- Municipal Gov. focuses on trunk sewer and WWTP as well as house connection in built-up area.
- Developer provides house connection and lateral sewer.
- Annual increase of service rate leaches 5%/year
- Construction cost saving and increased sewerage service contribute to operation / financial performance.



(3) Up-grading of Sewerage System

(i) Background-2: Sewage sludge management due to restricted landfilling site

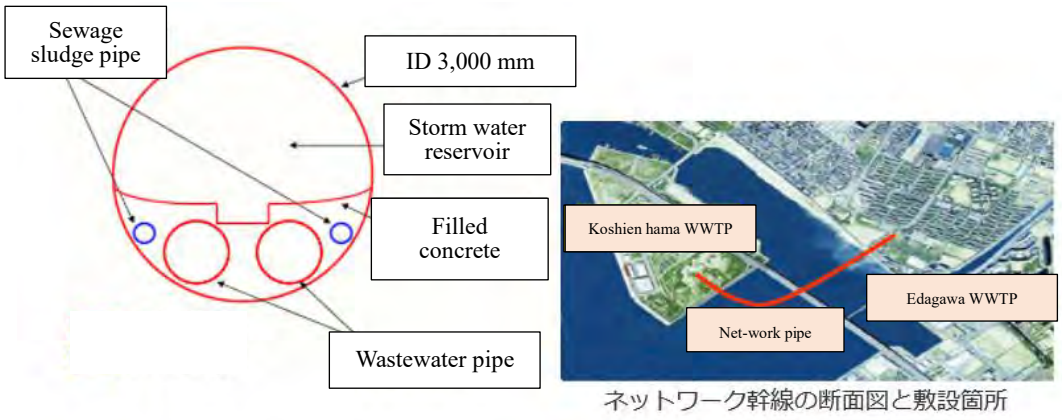
⇒ Sewage sludge reuse, Economy in scale, Environmental protection, etc.

Regional sewage sludge treatment (Sewage sludge management center)

(ii) Background-3: Eutrophication of receiving water and CSO mitigation

⇒ Advanced treatment (N & P removal), and CSO retention and treatment

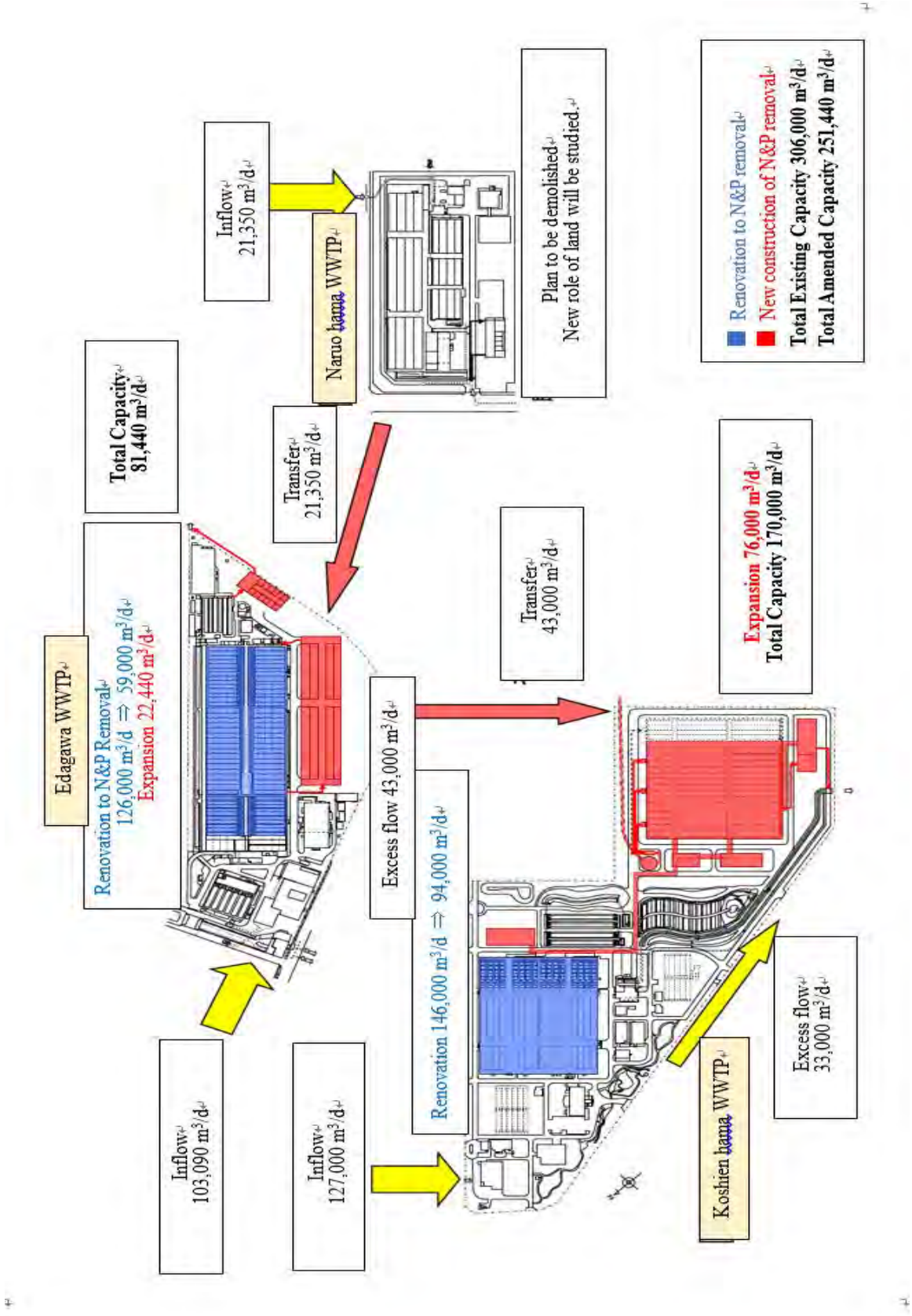
CSO: Combined Sewer Overflow



ネットワーク幹線の断面図と敷設箇所

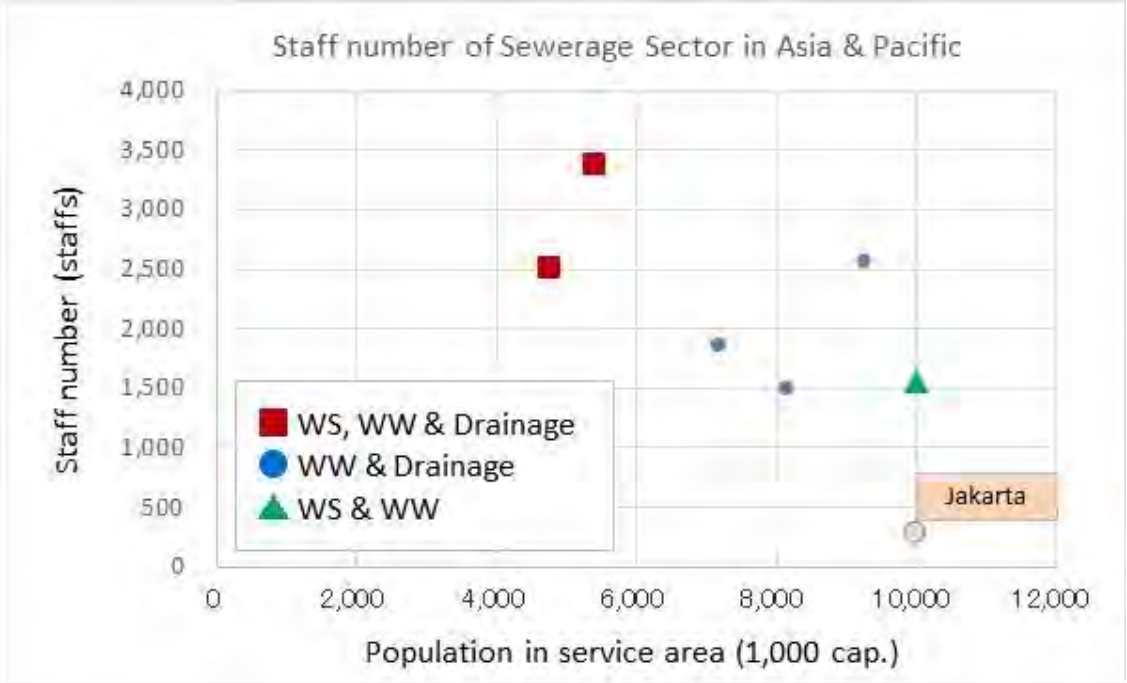
Inside of Net-work Pipe

(iii) Refurbishment Project Plan of N&P Removal and CSO Mitigation



2-4. Staff Number of Sewerage Sector in Asia & Pacific

(1) Staff Number of Sewerage Sector in Asia & Pacific



City	Service Type	Population in Service Area (1,000 Cap.)	House Connection (1,000HC)	Staff Number (Staffs)	Staff / 1,000 HC
Manila Water	WS & WW	10,000	1,092	1,555	1.4
Singapore PUB	WS, WW, Drainage & WWR	5,399	1,424	3,382	2.4
Malaysia IWK	WW	21,000		3,236*1	
Ho Chi Minh UDC	WW & Drainage	8,146		1,500	
Hong Kong DSD	WW & Drainage	7,188	2,468	1,856	0.8
Sydney Water	WS, WW, Drainage & WWR	4,755	1,848	2,509	1.4
Tokyo Sewerage Bureau	WW, Drainage & WWR	9,257	5,384	2,579	0.5

*1: Population Equivalent （Malaysia IWK)

WS: Water supply, WW: Wastewater, WWR: Wastewater Reuse

(2) Change of Staff Number of Individual Water Utilities

Singapore, Manila Water and IWk-Malaysia are expanding business size and business field as well as served population increase. Tokyo and Sydney Water are almost maturated business size.

Change of Staff Number of PUB, Singapore

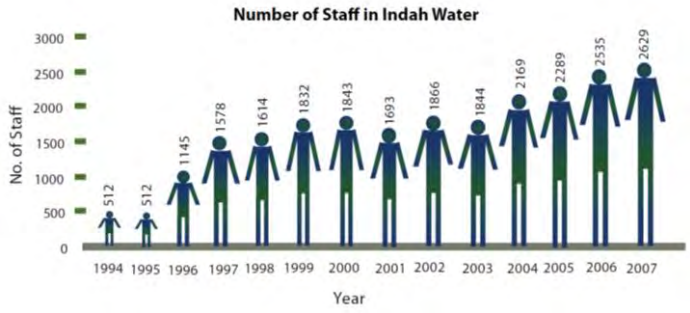
Ten - Year Summary Of Statistical Data

	FY 2014 12 months	FY 2013 12 months	FY 2012 12 months	FY 2011 12 months	FY 2010 12 months
EMPLOYEES					
Number of employees as at end of period/year					
- PUB	3,382	3,229	3,196	3,129	3,125
- PUBC	-	-	-	-	5
Group	3,382	3,229	3,196	3,129	3,130
CUSTOMERS					
Number of accounts as at end of period/year ('000)	1,424	1,363	1,333	1,312	1,294
PERFORMANCE INDICATORS					
As at end of period/year					
- Number of accounts served per PUB employee	421	422	417	419	414
- Net Operating Income (after grant) per employee (S$'000)	79	93	75	64	63
For period January - December					
- Flood Prone Areas (hectare)[1]	34	36	40	48	56
- Number of Disruptions per Month per 1,000 km of Sewers	11	12	13	14	15
- Domestic Water Consumption per Capita[2] per Day	150	151	152	153	154
- % of Unaccounted for Potable Water	5.2	5.2	4.7	5.0	5.2
- % of tests meeting WHO Guidelines for Drinking Water Quality 2011 and EPH (Quality of Piped Drinking Water) Regulations 2008[3]	100	100	100	100	100

Source: Annual Report 2014/2015, PUB, Singapore

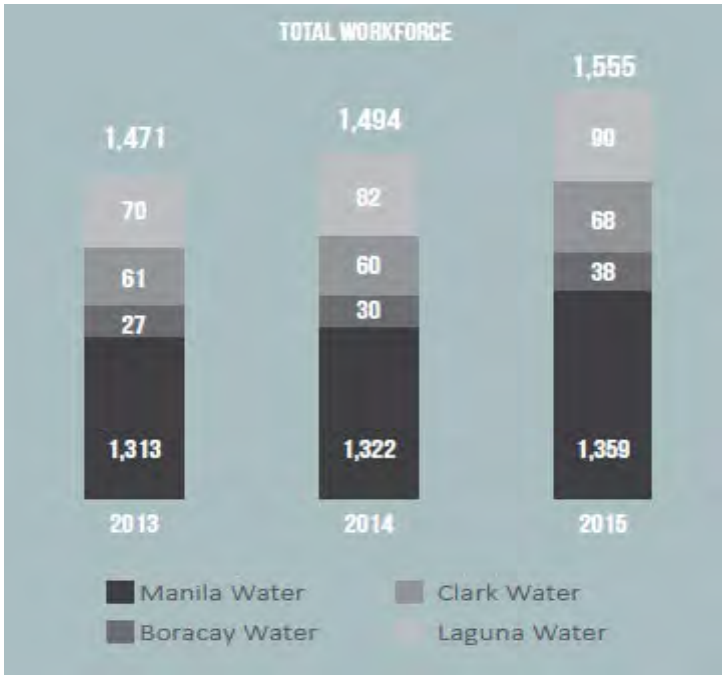
Change of Staff Number of IWK, Malaysia

Source: Sustainability Report 2012-2013, Indah Water, Malaysia



Source: Cooperate Sustainability Report 2007, IWK, Malaysia

Change of Staff Number of Manila Water, Philipine



Source: 2015 Annual and Sustaibale Report, Manila Water

Change of Staff Number of Sydney Water, Australia

Table 30: Workforce numbers

Human resources	2009–10	2010–11	2011–12	2012–13	2013–14
FTE – Permanent	2,794	2,749	2,604	2,459	2,288
FTE – Temporary	140	124	111	108	115
FTE – Part-time	120	132	118	112	106
Total	**3,054**	**3,005**	**2,833**	**2,679**	**2,509**

Source: Annual Report 2014, Sydney Water

Change of Staff Number, Tokyo Sewerage Bureau

Year	2008	2010	2012	2014	2016
Staff Number (staffs)	3,049	2,749	2,596	2,579	2,519

Source: Annual Report 2008 – 2014, Tokyo Sewerage Bureau

Part-3. Outline of Legal System/Sewerage Law in Japan

.3-1. Hierarchical Structure of Laws and Manuals & Institution

Manual and institutional design prescribe job on-site clearly accordant with legal background

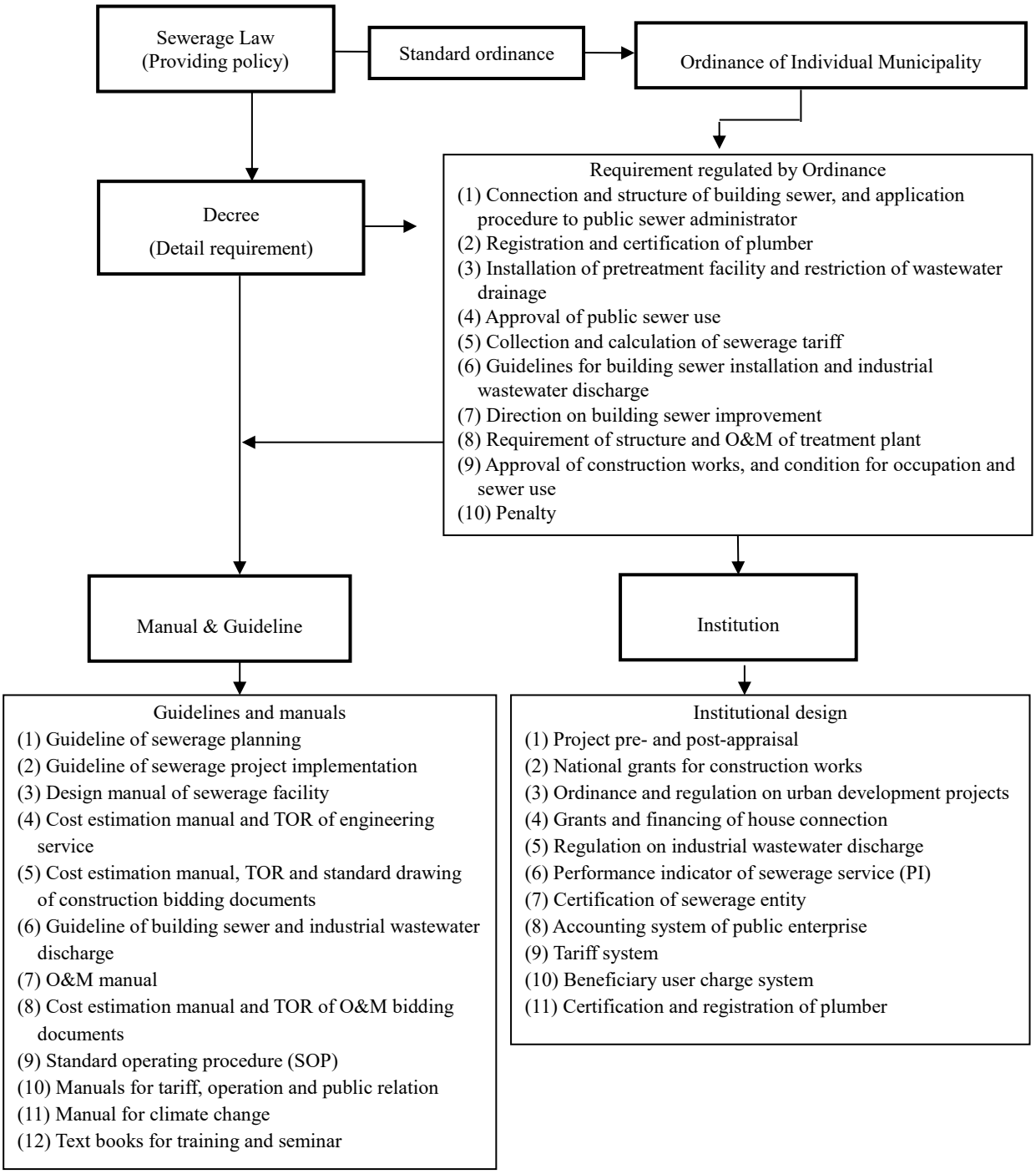
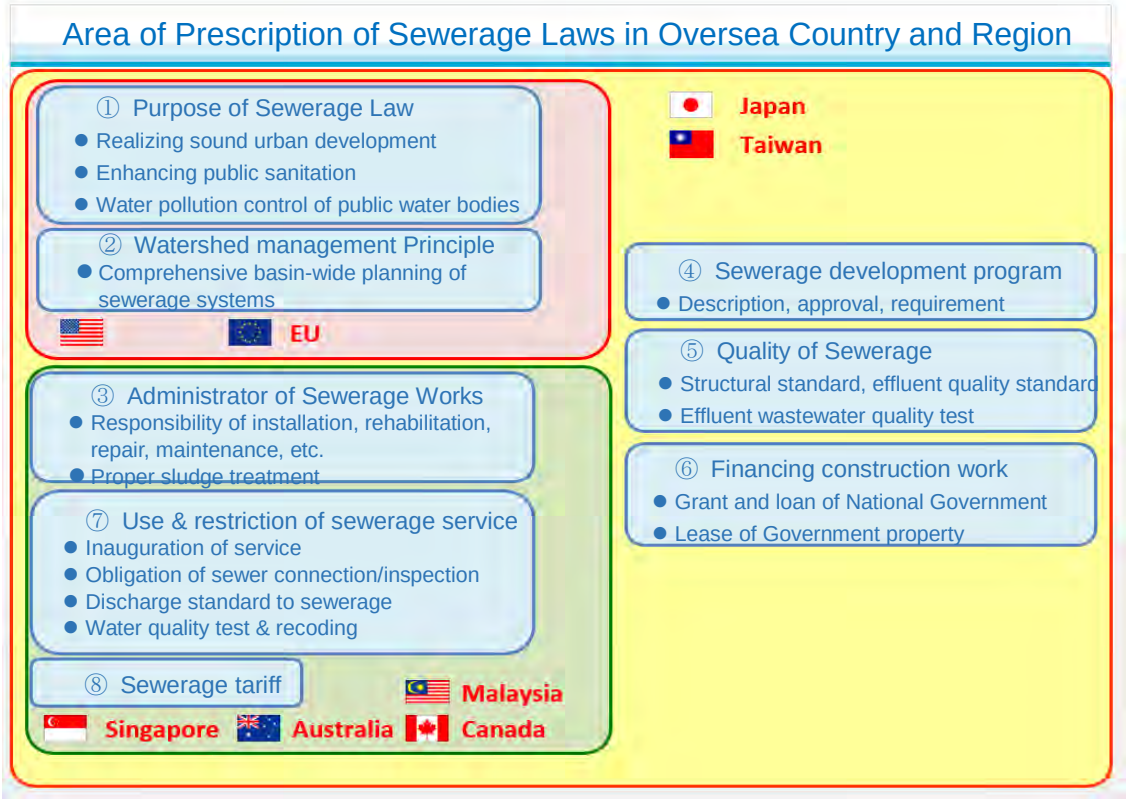


Figure 3-1 Outlines of Guidelines and Institution of Sewerage Works in Japan

3-2. Outline of Sewerage Law & Environmental Protection Law in Oversea

Laws in Japan and Taiwan are designed for administration power and use & restriction of sewerage service as well as roles of infrastructure.



Source: Workshop on 7th Conference of Vietnam and Japan, Jan. 30, 2015

Figure 3-2 Outline of Sewerage Law & Environmental Protection Law in Oversea

Recommendation to Sewerage Ordinance, DKI Jakarta
Articles and stipulation of ① and ③ through ⑧ among Figure above;

① Purpose of Sewerage Ordinance
③ Responsibility of Administrator of Sewerage Works
④ Sewerage Development Program
⑤ Quality of Sewerage
⑥ Financing Construction Work
⑦ Use and restriction of sewerage service
⑧ Sewerage tariff

Remarks: Water-shed management principle is difficult to regulate external municipality beyond DKI Jakarta territory. Instead, master plan within territory shall be stipulated.

3-3. Overall Structure of Sewerage Law, Decree, and Institution & Finance

Legal and financial system of the sewerage works described in accordance with the project flow of following Figure and Individual Feature of (1) Sewerage Development, (2) O&M of Sewerage System and (3) Management & Finance.

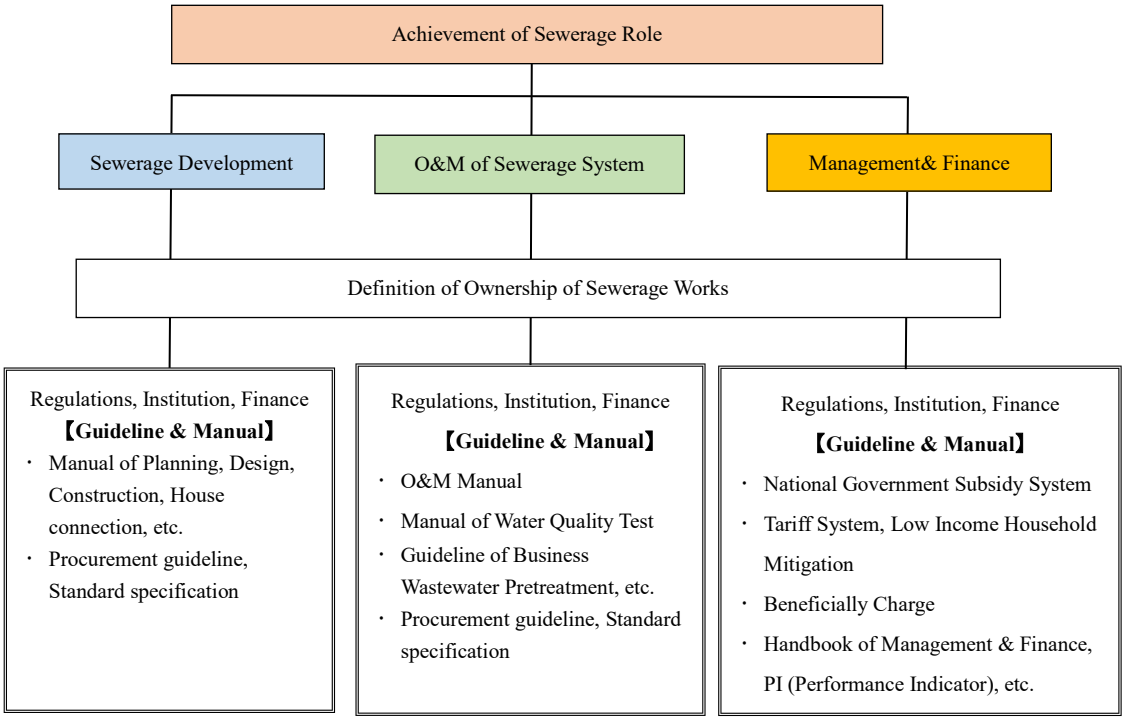


Figure 3-3 Overall Structure of Sewerage Law, Decree, and Institution & Finance

3-4. Sewerage Development Related Articles of Sewerage Law in Japan

Sewerage Law stipulates requirement for sewerage development based on power and responsibility of sewerage operator such as providing planning, securing technical quality, prevailing sewerage use and financial resources.

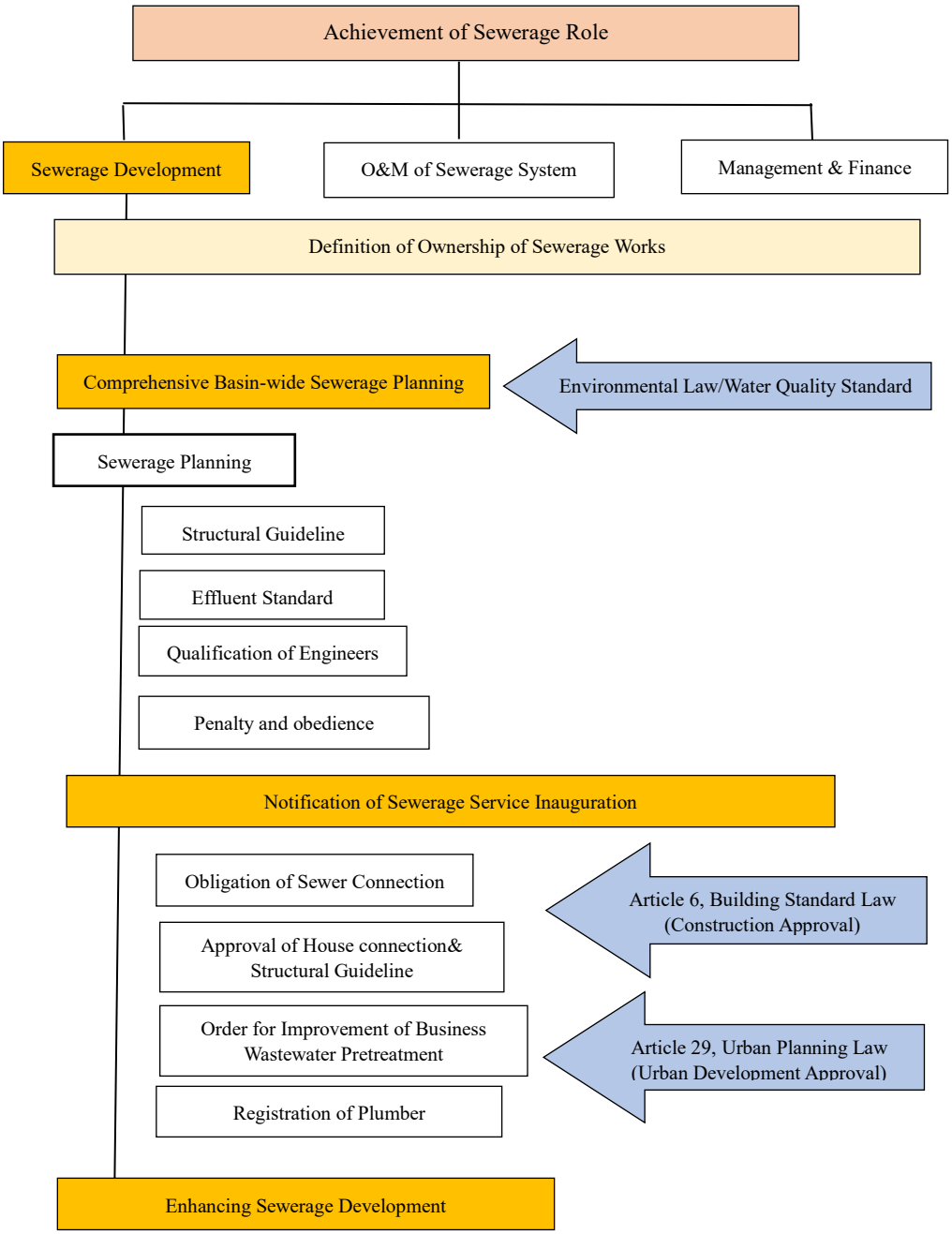


Figure 3-4 Articles related to Sewerage Development

3-5. O&M Related Articles of Sewerage Law in Japan

Sewerage Law stipulates requirement for O&M of sewerage system based on power and responsibility of sewerage operator such as obligation of user and plumber, wastewater discharge and effluent quality.

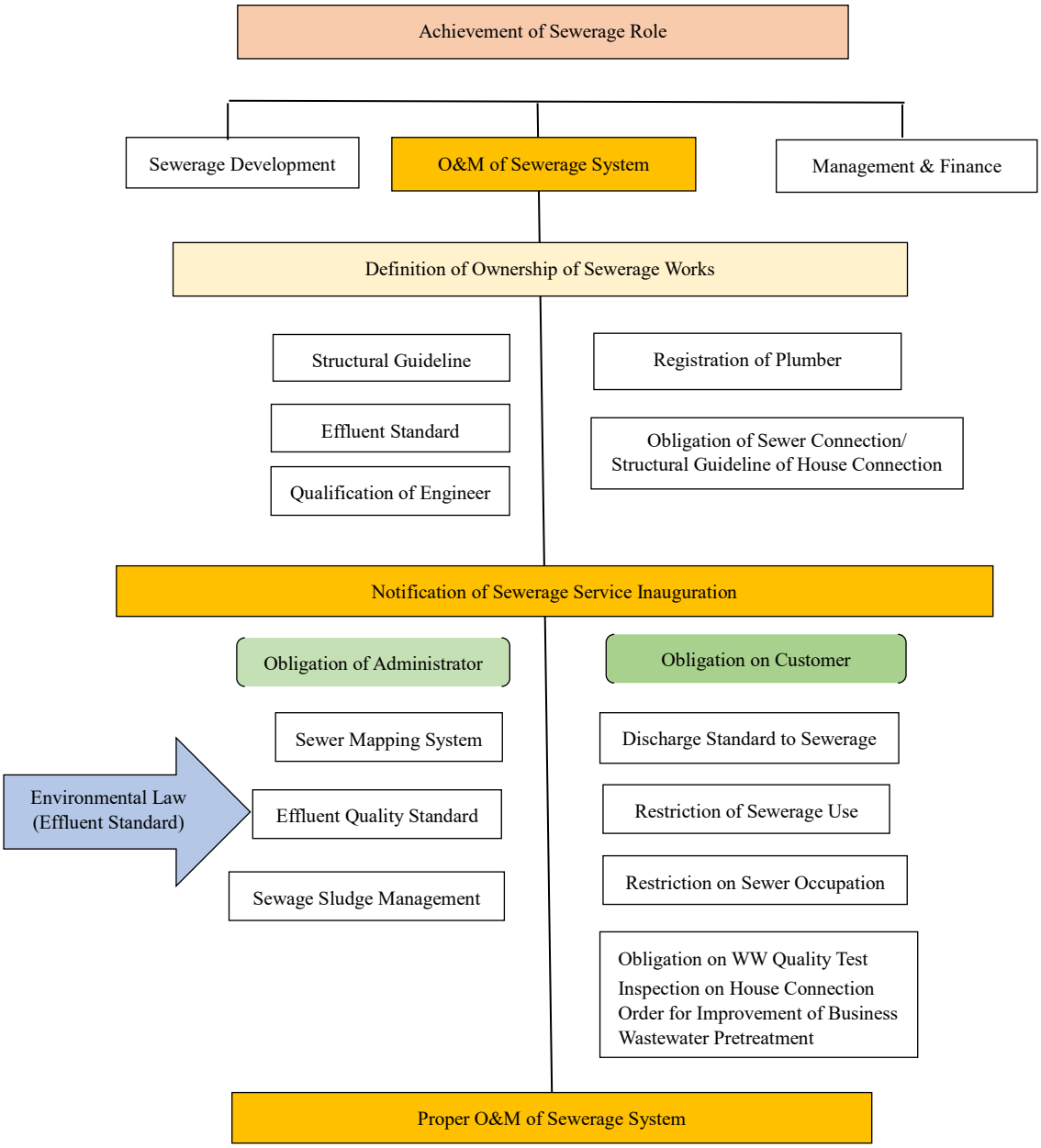


Figure 3-5 Articles Related to O&M of Sewerage System

3-6. Finance Related Articles of Sewerage Law in Japan

Sewerage Law stipulates requirement for finance of sewerage system based on power and responsibility of sewerage operator such as subsidy of National Government, local bond and tariff system.

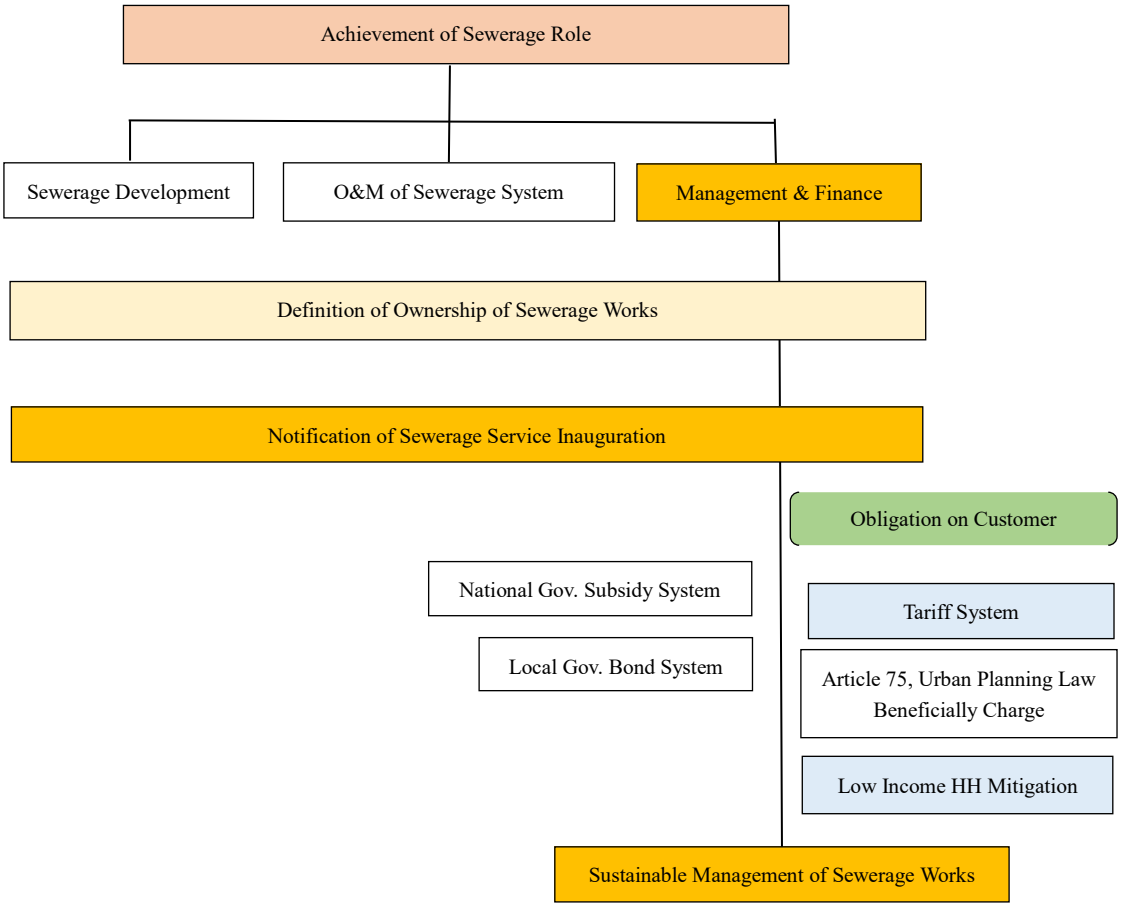
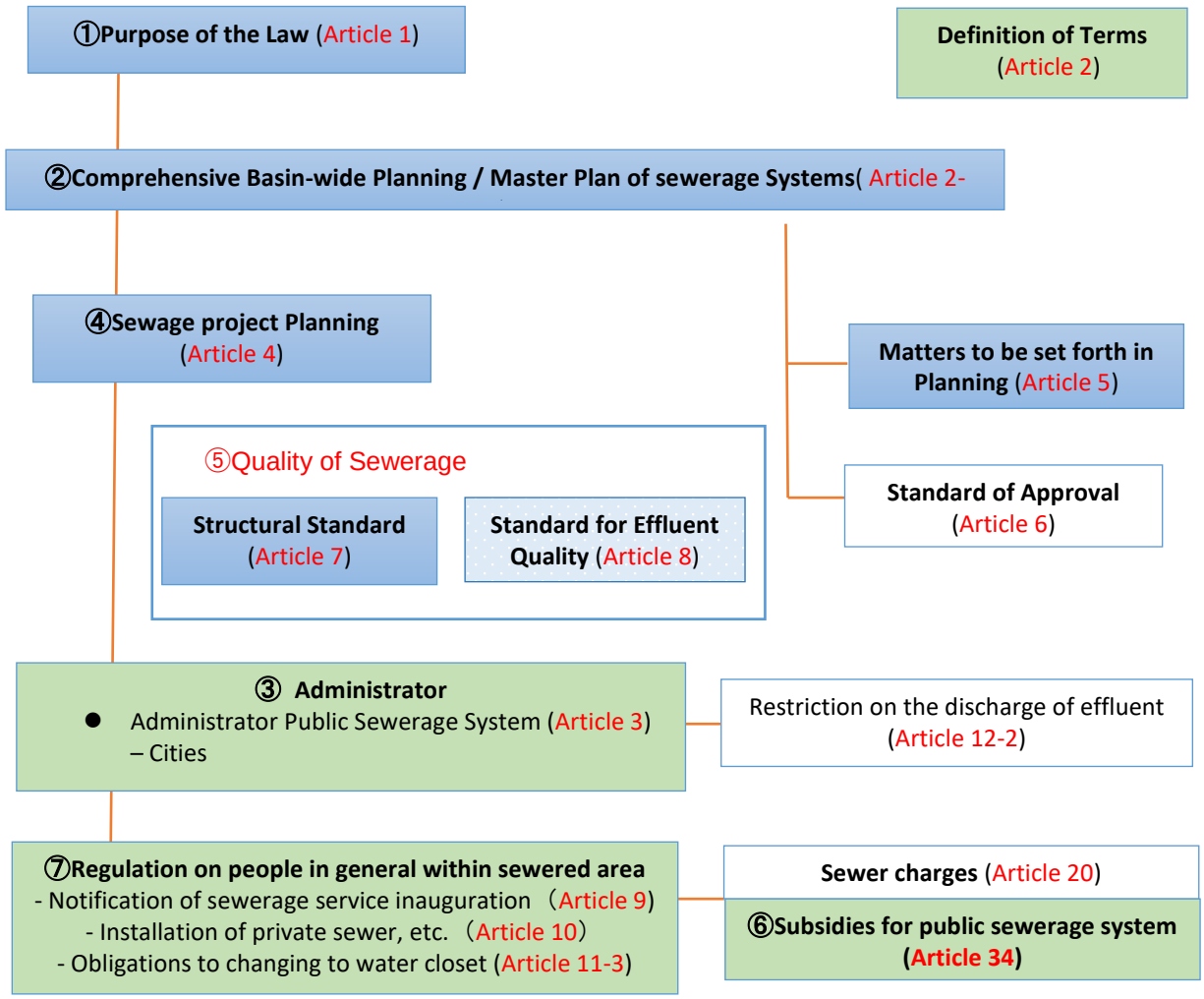


Figure 3-6 Articles Related to Management & Finance

3-7. Structure of Sewerage Law in Japan

Sewerage Law in Japan is a sole comprehensive legal system for management of sewerage system. It differs from Decrees in DKI Jakarta, which stipulates master plan, project implementation unit, conditions of sewerage discharge and tariff, separately.



Decree/Local Government Law is stipulated. Decree in DKI Jakarta shall be reviewed.
Decree/Local Government Law shall be stipulated due to National Gov. Law not promulgated.
Decree/Local Government Law is stipulated.

Source: Seminar on Japan Sewerage Act- Experience in formation and implementation, MLIT

Figure 3-7 Outline of Sewerage Law

3-8 Comparison of DKI Regulation/Decree and Sewerage Law in Japan

("Part-4" describes Recommendation of Sewerage Ordinance/Local Government Law to DKI)

Stage of stipulation	Description
Overall	・ Systematic / comprehensive legal frame such as law is not provided (Governor Decree is individually promulgated)
Already stipulated, however points to be reviewed	・ Weak administrative power / Responsibility of Municipality Government for sewerage development as well as providing sewerage service ・ Obligation and administrative procedure on residents in sewerage service area ・ Financial subsidy of Government for sewerage development
Not stipulated, and clear stipulation to be required	・ Roles of Sewerage of sanitation improvement and inundation mitigation as well as water pollution control in public water **(Storm water drainage is out-of-scope as well as focusing on domestic wastewater in wastewater management in Indonesia)** ・ Principle of Master Plan for complying with Environmental Quality Standards in view point of watershed management (Master Plan is already promulgated by Governor Decree) ・ Technical standard / requirements in order to achieve roles of sewerage.
On-site wastewater management	(Separately discussed) ・ Obligation of building owner ・ Responsibility on wastewater management of Municipal Government ・ Technical requirement of operator and engineer ・ Responsibility of On-site sludge treatment
Already stipulated, however careful institutional design (enhancing Article) to be required	・ Application of sewer connection ・ Wastewater discharge standard to public sewer ・ **Sewer charge, however lacks in PPP (polluter pay principle)**

Part-4. Recommendation of Sewerage Ordinance/Local Government Law

4-1. Basic Model of Sewerage Ordinance/Local Government Law

Proposed Basic model of Sewerage Ordinance/Local Government Law refers of Standard Sewerage Ordinance, which has been reviewed in accordance with social needs as well as sewerage development. Some articles are supplemented by Sewerage Law in Japan and Jokasou Law since Standard Sewerage Ordinance stipulates based on the principle of Sewerage Law and are out of scope on on-site wastewater management.
Following is a proposed basic model of sewerage ordinance.

Article	Right / Obligation	Content / Keyword
Article-1 Purpose of Ordinance	Administrative power **【Reference-1】**	Purpose of Ordinance, Role of Sewerage, Ownership/administration of sewerage works
Article 2 Definition of Terms	Defining terms	
Stipulation on Planning (if necessary)	Responsibility of Planning of Domestic (Municipal) Wastewater Management	Content and feature of Domestic (Municipal) Wastewater Management Plan Municipal sewerage operator shall make an implementation program when they start a sewerage project. Implementation program shall decide following items. - Lay-out, structure and capacity of sewerage facilities, and planned sewerage area - Location, structures, & capacities of WWTP - Dates of commencement &completion of construction works Requirements of implementation program - Location & capacity of sewerage shall be decided by considering precipitation, population, and others that affect quality and quantity of sewage, geography, land use, and conditions of receiving waters. - The structure of municipal sewerage shall conform to the technical requirements stipulated in the order of the sewerage law in order to keep sanitation and to secure pollution control.
Stipulation on Construction (if necessary)	Responsibility of PIU establishment	Municipal government shall design, build, operate, and maintain municipal sewerage.
Stipulation on Finance (if necessary)	Responsibility of Financing	National Government can subsidy a part of costs to local governments that install and/or refurbish sewerage within budgetary allowance. Detailed provisions are stipulated by Government Decree. National Government shall provide loan resource necessary for local governments that install and/or refurbish sewerage.
Article 3 – 5 Installation of house connection and private (building) sewer	Obligation of public sewer connection (discharge to public sewer) **【Reference-2】**	Public sewer connection within a definite period of time, Design criteria of house connection and requirement of sewer material, Application procedure

Article 6 Registration and order on plumber	Plumber registration, Qualification / certification of professional engineer **【Reference-3】**	Registration, renewal and revoke of plumber, requirement of installation work
Article 7 Inspection of private sewer installation	Inspection of installation work **【Reference-4】**	Inspection of installation work, issue of certification on house connection and private sewer
Article 8 - 12 Pretreatment of wastewater from business and industry	Installation of pretreatment facility, Restriction on wastewater discharge of specified factory, Assignment of water quality management professional, Notification of installation, suspension or removal of pretreatment facility **【Reference-2】& 【Reference-5】**	Installation of pretreatment facility, Restriction on wastewater discharge of specified factory, Discharge standard to public sewer, Assignment of water quality management professional, Notification of installation, suspension or removal of pretreatment facility
Article 13 Suspension or restriction of wastewater discharge	Right on suspension or restriction of wastewater discharge	Wastewater discharge to damage sewerage facility, Wastewater discharge to affect treatment function, Any other case necessary for sewerage management
Article 14 Notification of public sewer use	Application / notification of public sewer use, suspension, resume or abandonment	Application / notification of public sewer use, suspension, resume or abandonment
Article 15 – 17 Sewerage tariff	Right of tariff levy and collection, request on data submission **【Reference-2】& 【Reference-6】**	Tariff levy, tariff collection procedure, Tariff structure, Tariff calculation method
Sewerage Law Article 23 Sewerage Information Database	To create sewerage (asset) information data base To open data base if requested **【Reference-7】**	Proper management of sewerage system (data base on topographic, structural, operation and management)
Article 18 Order for improvement of pretreatment facility	Right / Order on facility improvement and operation practice of pretreatment facility	Improvement of structure of pretreatment facility, Improvement of operating practice
Article 19 - 26 Approval of activity and sewer occupation	Right on sewer facility occupation and user charge **【Reference-8】**	Application and approval of sewer use, Requirement of sewer use, Revoke of sewer use, Fee of application and user charge
Article 28 Responsibility of households and building owners who are not connected to separate sewer system	Responsibility for proper installation of on-site facilities, and proper operation and maintenance of them	[Key words] Responsibility of households and building owners, Technical standards for installation of on-site wastewater treatment facilities, Technical standards for operation and maintenance of on-site wastewater treatment facilities, **[Note-1 (Example of writing)]**
Article 29 Responsibility for regular desludging of household septic tanks	Who is responsible for regular desludging of household despotic tanks? (residents?, PD PAL JAYA?, both of them?)	[Key words] Responsibility for regular desludging of household septic tanks, **[Note-2 (Examples of writing)]**
Article 30 Qualification and training of desludging operators	Who will approve them? What are the conditions for approval? Who will train them?	[Key words] Qualification of desludging operators, Training of desludging technicians, **[Note-3 (Example of writing)]**
Article 31 Operation and Maintenance of Individual Treatment Plant (ITP) of commercial	Obligation of building owners to appoint ITP Technical Supervisor or ITP Operator	[Key words] Operation and Maintenance of Individual Treatment Plant (ITP) of commercial buildings and office buildings,

buildings and office buildings		Building owner's obligation to employ or to contract with the qualified ITP Operator or the original supplier for the operation and maintenance of ITP. Building owner's obligation to appoint an ITP Technical Supervisor for ITP for 501 PE or more. **[Note-4 (Example of writing)]**
Article 32 Qualification and training of ITP Technical Supervisors and ITP Operators	Who will qualify the ITP Technical Supervisor or ITP operator? Who will train and examine the capacity of the Technical Supervisor or ITP operator?	[Key words] Qualification of ITP Technical Supervisor and ITP Operator Training of ITP Operator **[Note-5(Example of writing)]**
Article 33 Inspection of ITP performance	BPLHD designate the inspection job to the designated inspection agency	[Key words] Inspection of the effluent water quality of ITP The designated inspection agency **[Note-6 (Example of writing)]**
Article 34 On-site Sludge treatment	Who is responsible for providing sludge treatment capacity? Who will pay the sludge treatment cost?	[Key words] Responsibility for providing sludge treatment capacity **[Note-7 (Example of writing)]**
Article 27 Penalty	Omitted	Omitted

White cell — Standard Sewerage Ordinance of Municipality Government in Japan

Sewerage Law in Japan (National)

Jhokasou Law in Japan

[Note-1]
An example of writing of Article 28 'Responsibility of households and building owners who are not connected to the separate sewer system'

'Owners of houses or buildings not connected to the separate sewer system are responsible for proper installation of on-site wastewater treatment facilities and proper operation and maintenance of such facilities, in accordance with the technical standards to be established by the relevant department of DKI Government.'

[Note-2]
Examples of writing of Article 29 'Responsibility for regular desludging of household septic tanks'

[Option 1]
'Owners of houses or buildings shall have the sludge accumulated in their on-site wastewater treatment facilities be emptied at the regular intervals to be established by the relevant department of DKI Government, which may vary depending on the size and the type of the facilities. Owners of houses or buildings shall pay the cost for the emptying and transporting services of the sludge to the operators who provide such services. Non-compliance to this article is subject to fines, the amount of which is to be determined by the relevant department of DKI Government.'

[Option 2]
'PD PAL JAYA is responsible for providing the sludge emptying and transporting services to all the houses and buildings which are not connected to the separate sewer system. PD PAL JAYA"s cost for such services shall be compensated by the DKI Government.'

[Note-3]
Examples of writing of Article 30 'Qualification and training of desludging operators'

[Option 1]

'The company or person who wants to conduct the emptying and transporting services of the sludge from the on-site wastewater treatment facilities (herein after referred to 'Desludging Operator') in DKI Jakarta area shall obtain the permission of DKI Governor. Such permission shall be given to the operator who meets all the technical standards set forth by the relevant department of DKI Government, one of such standards shall be the employment of the desludging technicians who possess the completion certificate of the training course for Desludging Operators administered by PD PAL JAYA. The permission shall be renewed every five (5) years. Once the Desludging Operator is proved not to meet such technical standards, or is engaged in unlawful activities, the permission shall be revoked by the DKI Governor. Non-compliance to this article is subject to fines, the amount of which is to be determined by the relevant department of DKI Government.'

[Option 2]
'Only PD PAL JAYA, or the company or person who is subcontracted by PD PAL JAYA, has the right to conduct the emptying and transporting services of the sludge from the on-site wastewater treatment facilities in DKI Jakarta area. Non-compliance to this article is subject to fines, the amount of which is to be determined by the relevant department of DKI Government.'

[Note-4]
An example of writing of Article 31 Operation and Maintenance of Individual Treatment Plant (ITP) of commercial buildings and office buildings

'For the Individual Treatment Plant (ITP) of the building not connected to the separate sewer system, the owner of the building shall employ or contract with the qualified ITP Operator or the original supplier of the ITP for the operation and maintenance of the ITP. For the ITP which treats the wastewater generated by more than 501 persons equivalent calculated based on the method prescribed in 'Population equivalent (PE) scale for ITP designation based on building usage type' in Governor Regulation No.122/2005, the owner of the building shall appoint an ITP Technical Supervisor who has the qualification of the ITP Operator with experience of operating the ITP of similar size for more than two (2) years. The ITP Technical Supervisor can outsource the operation and maintenance work and the desludging work of the ITP to the qualified ITP Operator or the original supplier of the ITP and to the qualified Desludging Operator. Non-compliance to this article is subject to fines, the amount of which is to be determined by the relevant department of DKI Government'

[Note-5]
An example of writing of Article 32 'Qualification and training of ITP Technical Supervisors and ITP Operators'

'The company or person who wants to conduct the operation and maintenance service of the ITP (hereinafter referred to 'ITP Operator') in DKI Jakarta area shall register to the DKI Governor. The ITP Operator shall assign at least a person who has obtained the completion certificate of the training course for ITP Operator administered by [name of the institution designated as the training institution (to be decided. It can be a public institution or a private institution such as a group of the suppliers of ITPs which have the operation and maintenance section in Indonesia.)] to each operation and maintenance work of ITP.'

[Note-6]
An example of writing of Article 33 'Inspection of ITP performance'

'The owner of the building not connected to the sewer system in DKI Jakarta area shall make the effluent water quality of the ITP be inspected by BPLHD or other institutions designated by BPLHD twice a year. If the effluent water quality of the ITP does not meet the effluent water quality standard, the DKI Governor can order the owner of the building, the ITP Supervisor, the ITP Operator or the original supplier of the ITP to improve the operation and maintenance of the ITP so that it may meet the effluent water quality of the ITP. Non-compliance to this article is subject to fines, the amount of which is to be determined by the relevant department of DKI Government.'

[Note-7]
An example of writing of Article 34 'On-site Sludge Treatment'

‘PD PAL JAYA shall develop the sludge treatment capacity for all the on-site wastewater treatment facilities in the DKI Jakarta area. PD PAL JAYA can charge the sludge treatment cost to the DKI Government.’

4-2. Notification of Inauguration of Sewerage Service Area for Obligation on Wastewater Discharge

(1) Notification of Inauguration of Sewerage Service Area

Articles stipulate the Obligation on Customer in order to exploit the benefit of sewerage system for which huge subsidy of National Government and general account spending of municipal government are invested.

Inauguration of the sewerage service is notified as soon as the sewerage system provided, accordingly customer in service area is identified and the obligation levied. Sewer mapping system and customer information are also provided in order to manage the sewerage system properly.

Article "Notification of Sewerage Service Inauguration / Obligation of Sewer Connection"

【Effects on Governing】
- Customer Information, Sewer-mapping system
- Sewerage Statistics

(Sewerage Service Area, Served Population)

【Obligation on Customer】
- Discharged to Public Sewer
- Installation of Sewer connection & Pretreatment
- Discharge Standard to Sewerage
- Levy on Sewerage Charge
- Mitigation on Low Income Household

Maximizing Project Efficiency: Huge investment (Subsidy & general account spending)
Sound Urban Development, Public Sanitation, Pollution Control in Public Water

(2) Obligation of Wastewater Discharge

Notify of Inauguration area and make service type clear. Legal system of obligation to connect to public sewerage as well as tariff levy in accordance with sewerage service type/level regulate residents..

Inauguration of Sewerage Service Area

Sewerage service area is notified for inauguration in order to regulate sewerage user.

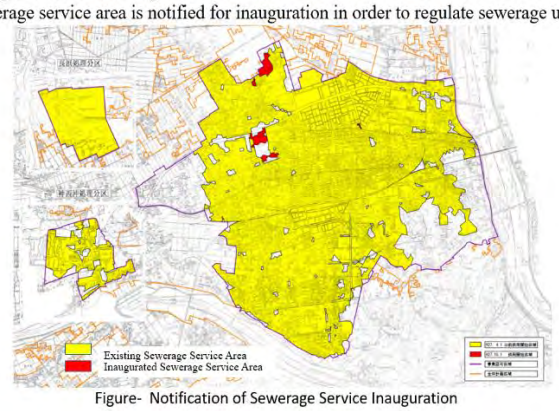
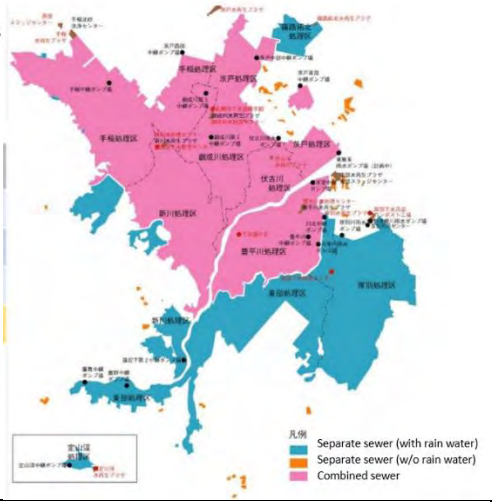


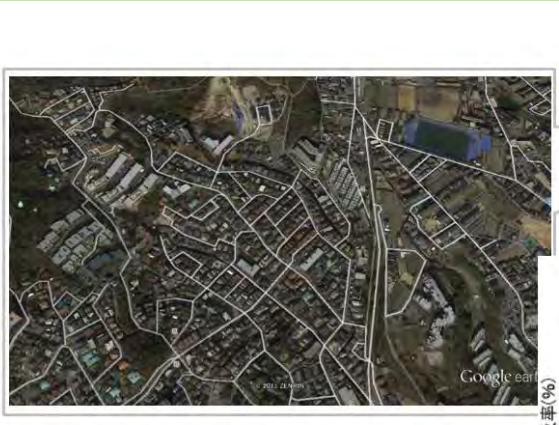
Figure- Notification of Sewerage Service Inauguration



Notification of Inauguration area	Type of Sewerage Service

Obligation of Sewer Connection

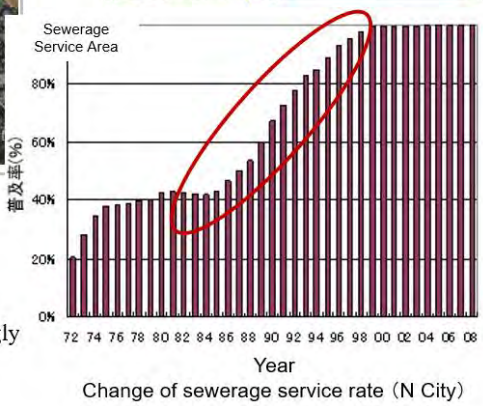
Urban Development provides Urban infrastructure
High-income customer for sustainable finance background



Sewerage Development of Build-transfer (N City)

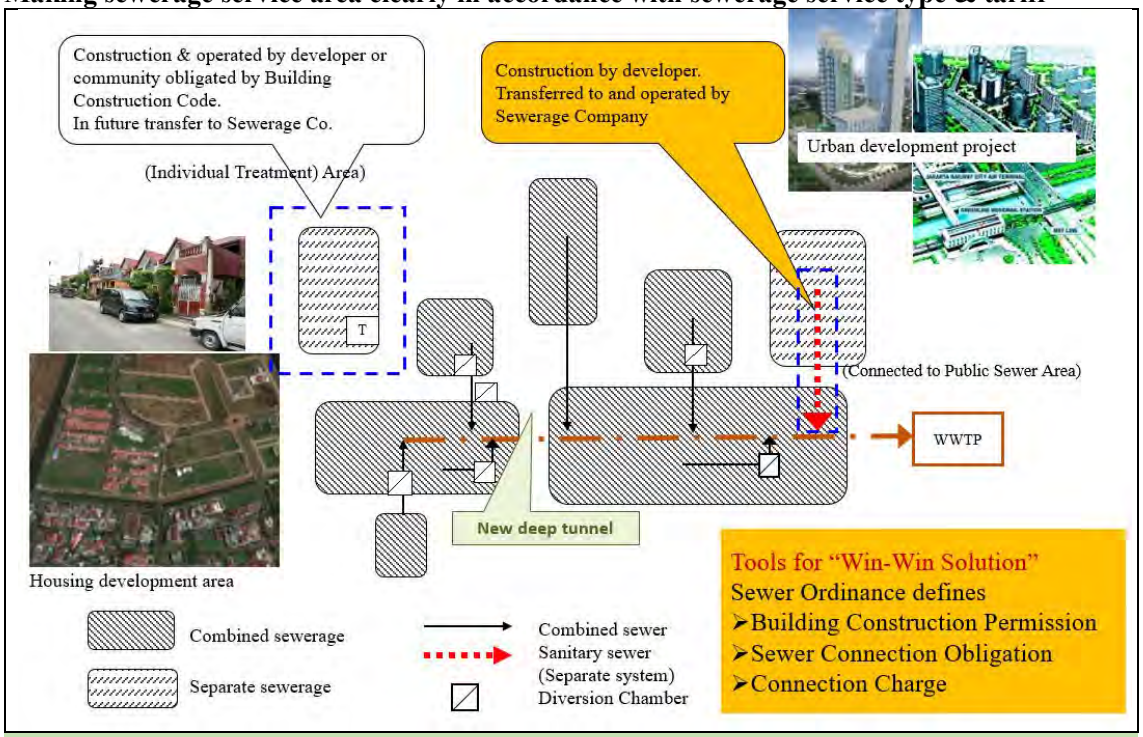
- Building Approval: Guiding sewer network
- Gov.: Focuses on Trunk sewer & WWTP
- Sewer constructed and transferred (Build-Transfer)
- 5 - 6 % Annual increase of sewerage area, accordingly achieved 100 % Coverage in 15 years.

⇒ **Speed-up & Saving Gov. Budget**

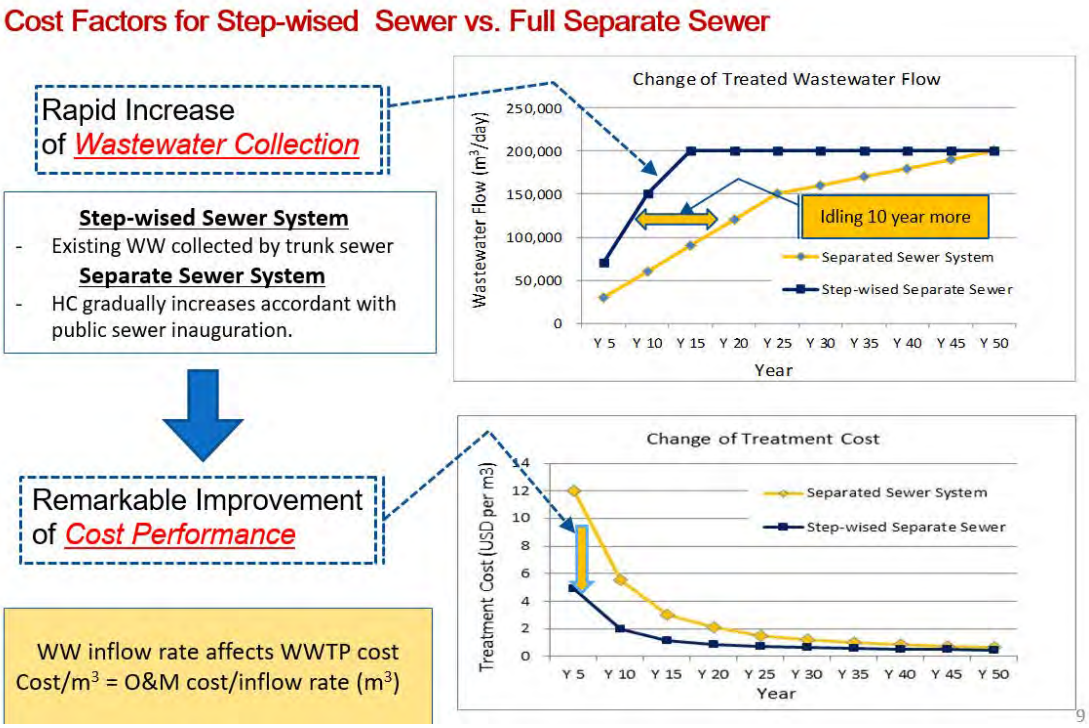


Change of sewerage service rate (N City)

Making sewerage service area clearly in accordance with sewerage service type & tariff

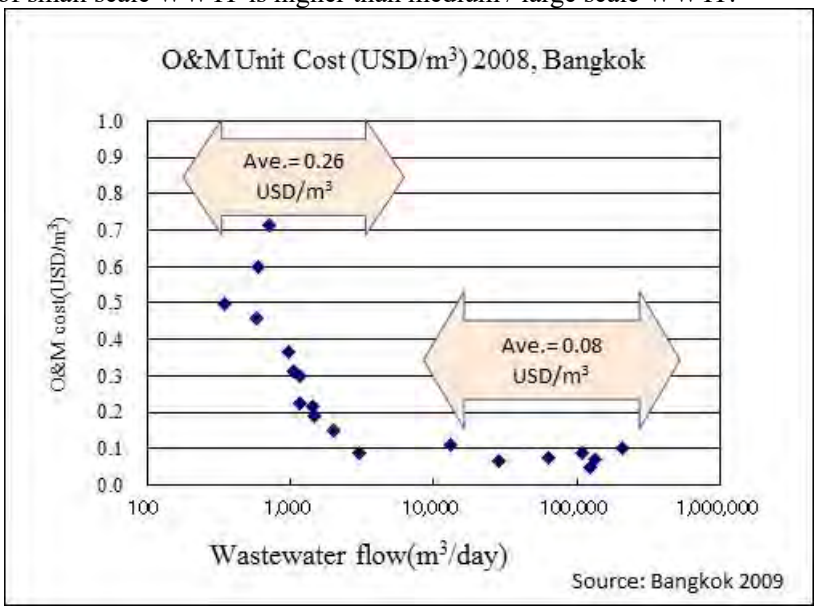


Comparison between Rapid increase of wastewater collection vs. Cost performance



Cost performance

O&M cost of small scale WWTP is higher than medium / large scale WWTP.



4-3. References of Providing Sewerage Ordinance

Reference-1 through 8 are provided in order to describe individual Article in detail as well as relation among Articles.

【Reference-1】

Article-1" Administration and management of sewerage works are stipulated by the Sewerage Ordinance **as well as Sewerage Law in Japan** and relevant regulations of National Government."

Article-1：Objectives of Sewerage Law in Japan

In this article, three different levels of objectives are described.

- The direct objective is stipulation of master planning and standards for design, build & operation of sewerage system.
- This enables the expansion of sewerage system, which is refereed as the medium objective.
- It leads to the highest level of objective or supreme goal of the law, which includes sustainable urban development, sanitation, and water pollution control.

Article 3: Operator of Municipal Sewerage

3.1 Municipal government shall design, build, operate, and maintain municipal sewerage.

【Reference-2】

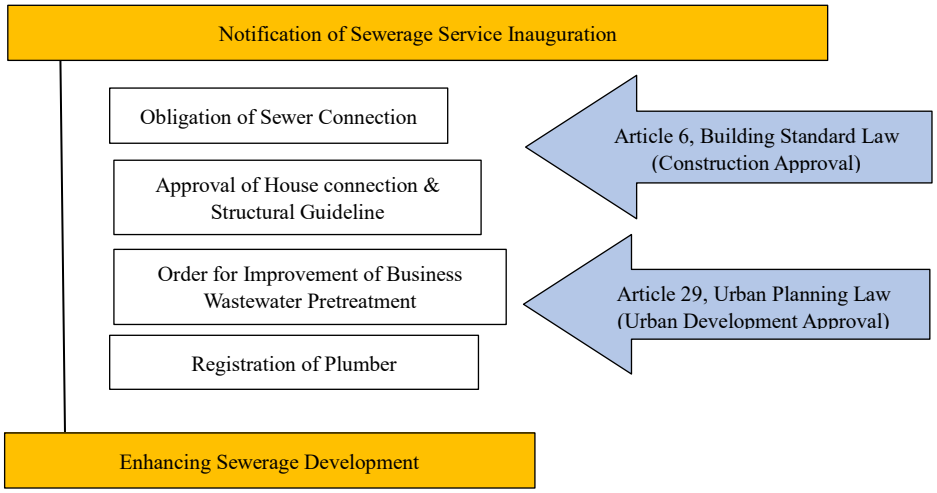
Sewerage service area is notified to public, and then public sewer connection is stipulated to residents. Operator is imposed responsibility to provide sewerage service.

(1) Power and right

Article 3

Person, who shall install house connection and private sewer at inauguration date of sewerage service, shall connect to public sewer within ** days.

Power for sewerage development through collaboration among Municipal Government



(2) Inauguration of Sewerage Service Area

Sewerage service area is notified for inauguration in order to regulate sewerage user.

Notification of Sewerage Service Area (1/2)

Inauguration of Sewerage Service Area

Sewerage service area is notified for inauguration in order to regulate sewerage user.

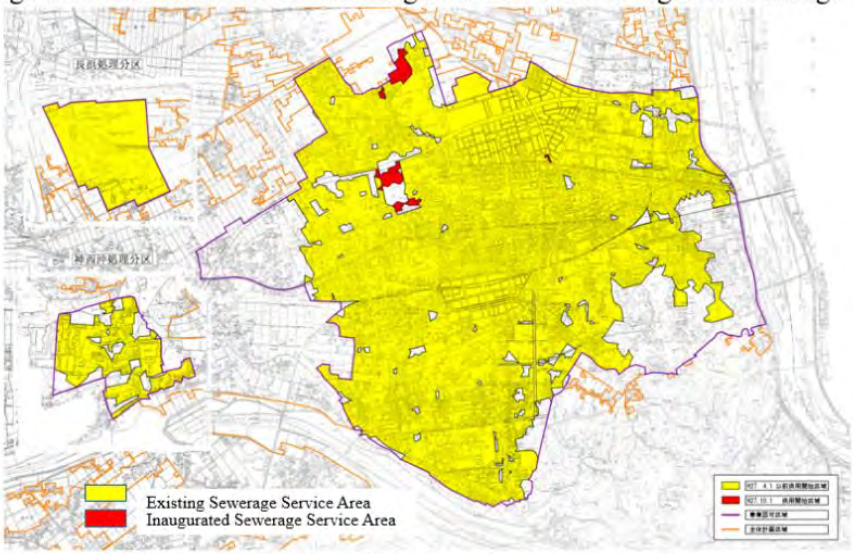


Figure- Notification of Sewerage Service Inauguration

Notification of Sewerage Service Area (2/2)

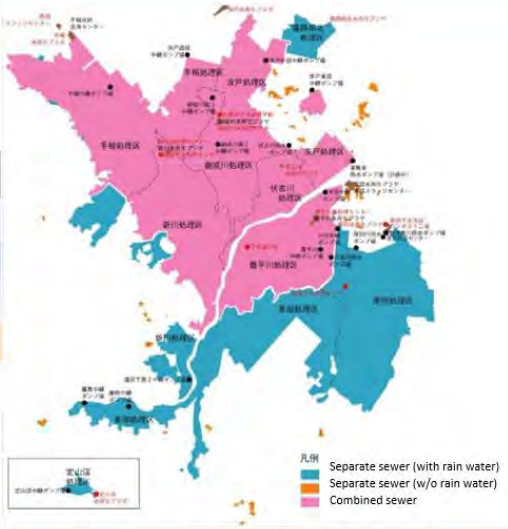
Recommendation to JKT
- Notify service type
- Tariff accordant with service type

Without septic tank cleansing service (Option-1)

Service type		Separate sewer	Interceptor sewer (Combined)
House connection	Gray water	Yes	Yes
	Black water	Yes	No (Septic tank)
Tariff	Gray water	Yes	Yes
	Black water	Yes	No

With septic tank cleansing service (Option-2)

Service type		Separate sewer	Interceptor sewer (Combined)
House connection	Gray water	Yes	Yes
	Black water	Yes	No (Septic tank)
Tariff	Gray water	Yes	Yes
	Black water	Yes	Yes



What type of tariff to be applied?
- Refer the experiences of Osaka, Singapore and Manila

Figure - Notification of Sewerage Service Inauguration with service type

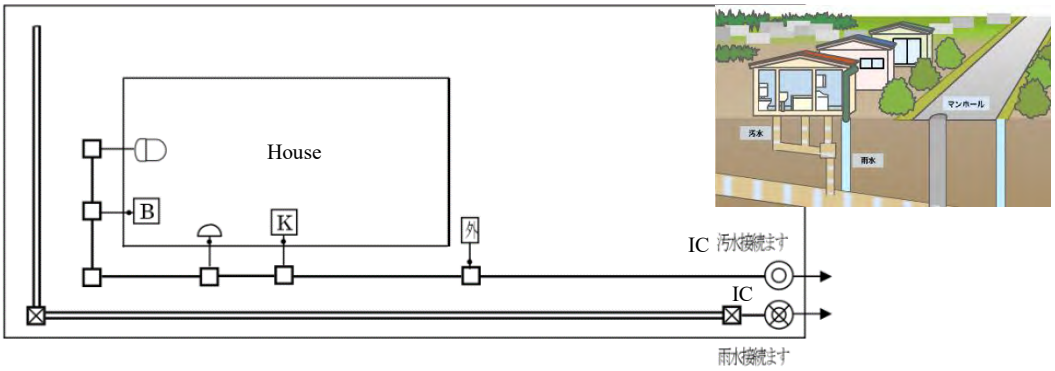
Recommendation to DKI Jakarta

Recommendation to DKI Jakarta based on the difference of service level or with/without house connection:

- Sewerage service area, which is divided to house connection area and interceptor sewer area, is notified to public.
- Separated sewer area applies house connection, accordingly obeys sewerage charge
- Combined sewer area applies interceptor sewer of existing drainage and septic tank remains, accordingly obeys environmental protection charge.

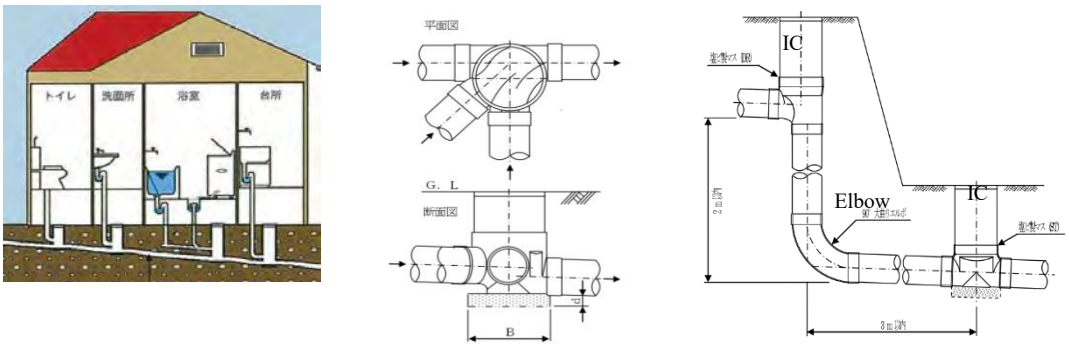
(3) Application/Approval of House Connection

(i) Technical Requirement



Inspection job: Based of desgin guideline and operation manual of house connection such as
- Approval of house connection and accumulation of costumer information
- Materials and structure of pipe, chamber, fittings, etc.
- Location of inspection chamber
- Sewer separation/Cross connection of sanitary sewer and storm water sewer
- Traps of oil/fat, odor, etc.
- In case of pretreatment plant of business/industrial wastewater discharge, facility and equipments, operation performance, recording, assigmnent of professional engineer, etc.

Figure- Approval of Building Sewer Connection and Wastewater Discharge to Public Sewer



Traps and chamber Fitting Drop-connection

Figure- Standard of Plumbing and House connection

Detailed Regulations for Enforcement

(1) Notification of Inauguration of Sewerage Service
- Area, Date, WWTP
- Type of sewerage service (with/without house connection, or with/without septik tank
- Media of notification
- Obligation of wastewater discharge and dead-line of house connection work, etc.

(2) Application / Approval of House Connection
- Application Form of wastewater discharge including name of owner, address and telephone number of applicant, bank acount number and remittance, etc.
- Technical requirement of building sewer such as drawing, flow rate, pipe diameter, gradient, pipe material, calculation documents, etc.

【Reference-3】

Plumber registration, Qualification / Certification of professional engineer

Objectives:
- Rule for private business "Creditable quality with affordable cost"
- Task force for enhancing house connection
- Outsourcing of claim resolution on sewer maintenance (inspection, cleansing and fixing)

Article 6 Registration of plumber Article 6-2 Application of registration Article 6-3 Requirement of registration Article 6-4 Professional engineer of plumbing Article 6-5 Registration of professional engineer Article 6-6 Application of professional engineer registration Article 6-7 Requirement on professional engineer registration Article 6-8 Professional engineer examination Article 6-9 Certificate of professional engineer Article 6-10 Certificate of plumber registration Article 6-11 Responsibility and norm Article 6-12 Notification of change Article 6-13 Revocation and suspension of registration	Sewer connection application - Cost estimation - Construction contract - Commissioning - Sewer use 

Detailed Regulations for Enforcement

(1) Registration
- Requirement of plumber
- Registration fee
- Application Form of applicant including name of owner, address and telephone number
- Number of employee, certification of professional engineer, work force, etc.

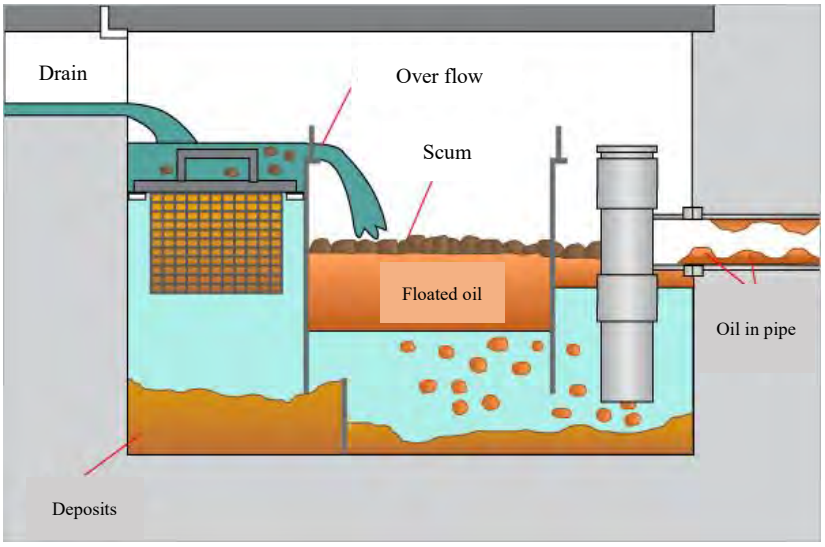
(2) Responsibility and norm
- Certification, examination and training
- Penalty, fine, etc.

【Reference-4】

Inspection of private sewer installation secures to use public sewer properly. Sewerage is usually affected by innocent or illicit users such as wastewater spill out due to clogging and storm water infiltration, degradation by harmful waste and others.

Pipe, inspection chamber and pretreatment facility, if necessary, are inspected whether they comply with guideline.

1. Person, who installed private sewer, shall notify the completion of construction work to Mayor of City within ** days, and accept the inspection of city officer in accordance with the regulation on private sewer installation and structure.
2. City office issues the certificate of inspection to owner of private sewer since the installed private sewer complies with the regulation on private sewer installation and structure.



Detailed Regulations for Enforcement

(1) Application / Approval of Pretreatment Facility

- Application Form of wastewater discharge including name of owner, address and telephone number of applicant, bank account number and remittance, etc.
- Business type, flow rate and quality of wastewater
- Technical requirement of pretreatment facility such as treatment process, drawing, flow rate, pipe diameter, gradient, pipe material, caluculation documents, etc.
- Name of professional engineer with certification, etc.

(2) Operation and Reporting

- Reporting Form of treatment condition such flow rate, test result of wastewater quality, etc.

【Reference-5】
Discharge Standards to Sewerage System

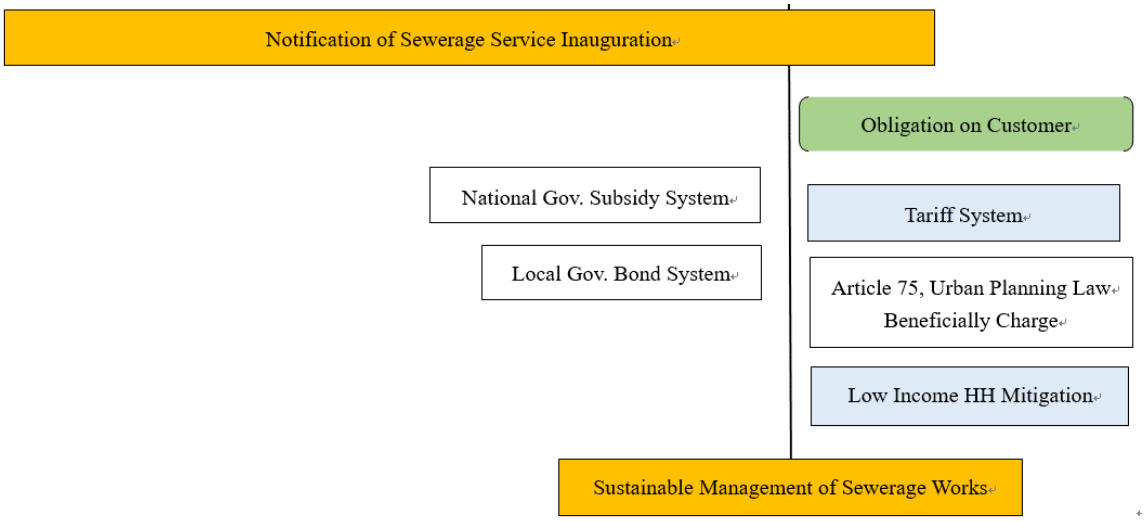
Table below is Example of Standards for Wastewater Characteristics for Discharge to Sewerage System.

Material or Item				Discharge more than 50 m^3/d	Discharges less than 50 m^3/d
Hazardous Substances	Cadmium			Less than 0.1mg/l	Less than 0.1mg/l
	Cyan			Less than 1mg/l	Less than 1mg/l
	Organic Phosphorus			Less than 1mg/l	Less than 1mg/l
	Lead			Less than 0.1mg/l	Less than 0.1mg/l
	Six Equivalent Chromium			Less than 0.5mg/l	Less than 0.5mg/l
	Arsenic			Less than 0.1mg/l	Less than 0.1mg/l
	Total Mercury			Less than 0.005mg/l	Less than 0.005mg/l
	Alkyl mercury			Not detected	Not detected
	Polychlorobiphenyl			Less than 0.003mg/l	Less than 0.003mg/l
	Trichloroethylene			Less than 0.3mg/l	Less than 0.3mg/l
	Tetrachloroethylene			Less than 0.1mg/l	Less than 0.1mg/l
	Dichloromethane			Less than 0.2mg/l	Less than 0.2mg/l
	Carbon tetrachloride			Less than 0.02mg/l	Less than 0.02mg/l
	1,2-Dichloroethane			Less than 0.04mg/l	Less than 0.04mg/l
	1,1-Dichloroethylene			Less than 0.2mg/l	Less than 0.2mg/l
	cis-1,2-Dichloroethylene			Less than 0.4mg/l	Less than 0.4mg/l
	1,1,1-Tricholoroethane			Less than 3mg/l	Less than 3mg/l
	1,1,2-Trichloroethane			Less than 0.06mg/l	Less than 0.06mg/l
	1,3-Dichlotobenzene			Less than 0.02mg/l	Less than 0.02mg/l
	Thiuram			Less than 0.06mg/l	Less than 0.06mg/l
	Simazine			Less than 0.03mg/l	Less than 0.03mg/l
	Tiobencarb			Less than 0.2mg/l	Less than 0.2mg/l
	Benzene			Less than 0.1mg/l	Less than 0.1mg/l
	Selenium			Less than 0.1mg/l	Less than 0.1mg/l
	Boron and its compounds		to river	Less than 10mg/l	Less than 10mg/l
			to sea	Less than 230mg/l	Less than 230mg/l
	Fluoride and its compounds		to river	Less than 8mg/l	Less than 8mg/l
			to sea	Less than 15mg/l	Less than 15mg/l
Environmental and Other Parameters	Total chromium			Less than 2mg/l	Less than 2mg/l
	Copper			3less than mg/l	Less than 3mg/l
	Zinc			Less than 2mg/l	Less than 2mg/l
	Phenolic compounds			5mg/l	-
	Iron (soluble)			Less than 10mg/l	-
	Manganese (soluble)			Less than 10mg/l	-
	BOD	General		Les than600mg/l	-
		Manufacture, gas		Less than 300mg/l	
	SS	General		Less than 600mg/l	-
		Manufacture, gas		Less than 300mg/l	
	Normal Hexane Extract	Mineral oil		Less than 5mg/l	-
		Animal and vegetable oil		Less than 30mg/l	-
	Nitrogen			Less than 120mg/l	-
	Phosphorus			Less than 16mg/l	-
	pH	general		5 to 9	5 to 9
		Manufacture, gas		5.7 to 8.7	5.7 to 8.7
	Temperature	general		Less than 45℃	Less than 45℃
		Manufacture, gas		Less than 40℃	Less than 40℃
	Iodine consumption			Less than 220mg/l	Less than 220mg/l

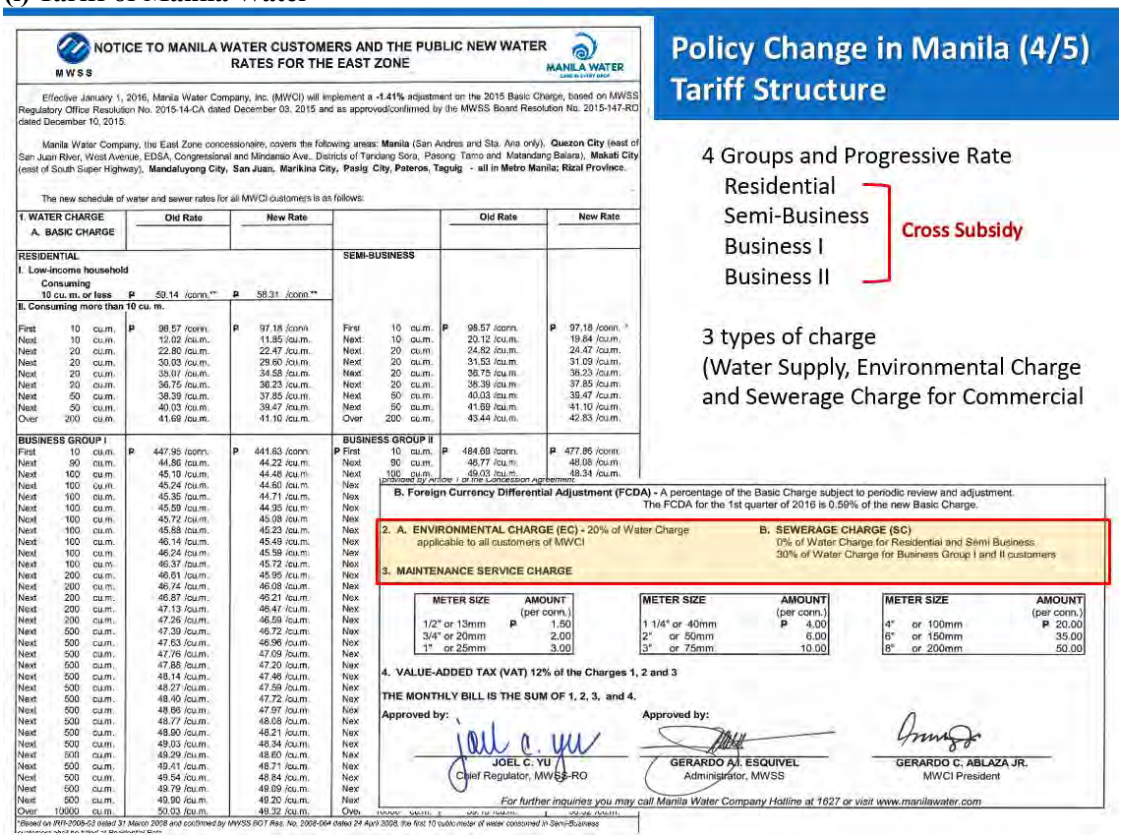
Source: Example of ordinary city of Japan

【Reference-6】
Tariff collection, Tariff calculation and Request of data submission

Tariff is designed to enhance financial sustainability as well as the affordability of user. Tariff structure is appropriate inaccordantwith locality of municiplity. Cross subsidy works well to secure financial resource as well as affordability of low income.



(i) Tariff of Manila Water



NOTICE TO MANILA WATER CUSTOMERS AND THE PUBLIC NEW WATER RATES FOR THE EAST ZONE

MWSS — MANILA WATER

Effective January 1, 2016, Manila Water Company, Inc. (MWCI) will implement a **-1.41%** adjustment on the 2015 Basic Charge, based on MWSS Regulatory Office Resolution No. 2015-14-CA dated December 03, 2015 and as approved/confirmed by the MWSS Board Resolution No. 2015-147-RO dated December 10, 2015.

Manila Water Company, the East Zone concessionaire, covers the following areas: **Manila** (San Andres and Sta. Ana only), **Quezon City** (east of San Juan River, West Avenue, EDSA, Congressional and Mindanao Ave., Districts of Tandang Sora, Pasong Tamo and Matandang Balara), **Makati City** (east of South Super Highway), **Mandaluyong City, San Juan, Marikina City, Pasig City, Pateros, Taguig - all in Metro Manila; Rizal Province.**

The new schedule of water and sewer rates for all MWCI customers is as follows:

1. WATER CHARGE A. BASIC CHARGE	Old Rate	New Rate
RESIDENTIAL		
I. Low-income household Consuming 10 cu. m. or less	₱ 59.14 /conn.**	₱ 58.31 /conn.**
II. Consuming more than 10 cu. m.		
First 10 cu.m.	₱ 98.57 /conn.	₱ 97.18 /conn.
Next 10 cu.m.	12.02 /cu.m.	11.85 /cu.m.
Next 20 cu.m.	22.80 /cu.m.	22.47 /cu.m.
Next 20 cu.m.	30.03 /cu.m.	29.60 /cu.m.
Next 20 cu.m.	35.07 /cu.m.	34.58 /cu.m.
Next 20 cu.m.	36.75 /cu.m.	36.23 /cu.m.
Next 50 cu.m.	38.39 /cu.m.	37.85 /cu.m.
Next 50 cu.m.	40.03 /cu.m.	39.47 /cu.m.
Over 200 cu.m.	41.69 /cu.m.	41.10 /cu.m.
BUSINESS GROUP I		
First 10 cu.m.	₱ 447.95 /conn.	₱ 441.63 /conn.
Next 90 cu.m.	44.86 /cu.m.	44.22 /cu.m.
Next 100 cu.m.	45.10 /cu.m.	44.48 /cu.m.
Next 100 cu.m.	45.24 /cu.m.	44.60 /cu.m.
Next 100 cu.m.	45.35 /cu.m.	44.71 /cu.m.
Next 100 cu.m.	45.59 /cu.m.	44.95 /cu.m.
Next 100 cu.m.	45.72 /cu.m.	45.08 /cu.m.
Next 100 cu.m.	45.88 /cu.m.	45.23 /cu.m.
Next 100 cu.m.	46.14 /cu.m.	45.49 /cu.m.
Next 100 cu.m.	46.24 /cu.m.	45.59 /cu.m.
Next 100 cu.m.	46.37 /cu.m.	45.72 /cu.m.
Next 200 cu.m.	46.61 /cu.m.	45.95 /cu.m.
Next 200 cu.m.	46.74 /cu.m.	46.08 /cu.m.
Next 200 cu.m.	46.87 /cu.m.	46.21 /cu.m.
Next 200 cu.m.	47.13 /cu.m.	46.47 /cu.m.
Next 200 cu.m.	47.26 /cu.m.	46.59 /cu.m.
Next 500 cu.m.	47.39 /cu.m.	46.72 /cu.m.
Next 500 cu.m.	47.63 /cu.m.	46.96 /cu.m.
Next 500 cu.m.	47.76 /cu.m.	47.09 /cu.m.
Next 500 cu.m.	47.88 /cu.m.	47.20 /cu.m.
Next 500 cu.m.	48.14 /cu.m.	47.46 /cu.m.
Next 500 cu.m.	48.27 /cu.m.	47.58 /cu.m.
Next 500 cu.m.	48.40 /cu.m.	47.72 /cu.m.
Next 500 cu.m.	48.66 /cu.m.	47.97 /cu.m.
Next 500 cu.m.	48.77 /cu.m.	48.08 /cu.m.
Next 500 cu.m.	48.90 /cu.m.	48.21 /cu.m.
Next 500 cu.m.	49.03 /cu.m.	48.34 /cu.m.
Next 500 cu.m.	49.29 /cu.m.	48.60 /cu.m.
Next 500 cu.m.	49.41 /cu.m.	48.71 /cu.m.
Next 500 cu.m.	49.54 /cu.m.	48.84 /cu.m.
Next 500 cu.m.	49.79 /cu.m.	49.09 /cu.m.
Next 500 cu.m.	49.90 /cu.m.	49.20 /cu.m.
Over 10000 cu.m.	50.03 /cu.m.	49.32 /cu.m.

	Old Rate	New Rate
SEMI-BUSINESS		
First 10 cu.m.	₱ 98.57 /conn.	₱ 97.18 /conn.
Next 10 cu.m.	20.12 /cu.m.	19.84 /cu.m.
Next 20 cu.m.	24.82 /cu.m.	24.47 /cu.m.
Next 20 cu.m.	31.53 /cu.m.	31.09 /cu.m.
Next 20 cu.m.	38.75 /cu.m.	38.23 /cu.m.
Next 20 cu.m.	38.39 /cu.m.	37.85 /cu.m.
Next 50 cu.m.	40.03 /cu.m.	39.47 /cu.m.
Next 50 cu.m.	41.69 /cu.m.	41.10 /cu.m.
Over 200 cu.m.	43.44 /cu.m.	42.83 /cu.m.
BUSINESS GROUP II		
First 10 cu.m.	₱ 484.69 /conn.	₱ 477.86 /conn.
Next 90 cu.m.	48.77 /cu.m.	48.08 /cu.m.
Next 100 cu.m.	49.03 /cu.m.	48.34 /cu.m.

provided by Article 7 of the Concession Agreement.

B. Foreign Currency Differential Adjustment (FCDA) - A percentage of the Basic Charge subject to periodic review and adjustment. The FCDA for the 1st quarter of 2016 is 0.59% of the new Basic Charge.

2. A. ENVIRONMENTAL CHARGE (EC) - 20% of Water Charge applicable to all customers of MWCI

B. SEWERAGE CHARGE (SC) 0% of Water Charge for Residential and Semi Business 30% of Water Charge for Business Group I and II customers

3. MAINTENANCE SERVICE CHARGE

METER SIZE	AMOUNT (per conn.)
1/2" or 13mm	₱ 1.50
3/4" or 20mm	2.00
1" or 25mm	3.00

METER SIZE	AMOUNT (per conn.)
1 1/4" or 40mm	₱ 4.00
2" or 50mm	6.00
3" or 75mm	10.00

METER SIZE	AMOUNT (per conn.)
4" or 100mm	₱ 20.00
6" or 150mm	35.00
8" or 200mm	50.00

4. VALUE-ADDED TAX (VAT) 12% of the Charges 1, 2 and 3

THE MONTHLY BILL IS THE SUM OF 1, 2, 3, and 4.

Approved by:

JOEL C. YU
Chief Regulator, MWSS-RO

Approved by:

GERARDO A.I. ESQUIVEL
Administrator, MWSS

GERARDO C. ABLAZA JR.
MWCI President

For further inquiries you may call Manila Water Company Hotline at 1627 or visit www.manilawater.com

*Based on IRR-2008-02 dated 31 March 2008 and confirmed by MWSS BOT Res. No. 2008-064 dated 24 April 2008, the first 10 cubic meter of water consumed in Semi-Business

Policy Change in Manila (4/5)
Tariff Structure

4 Groups and Progressive Rate
Residential
Semi-Business
Business I
Business II
Cross Subsidy

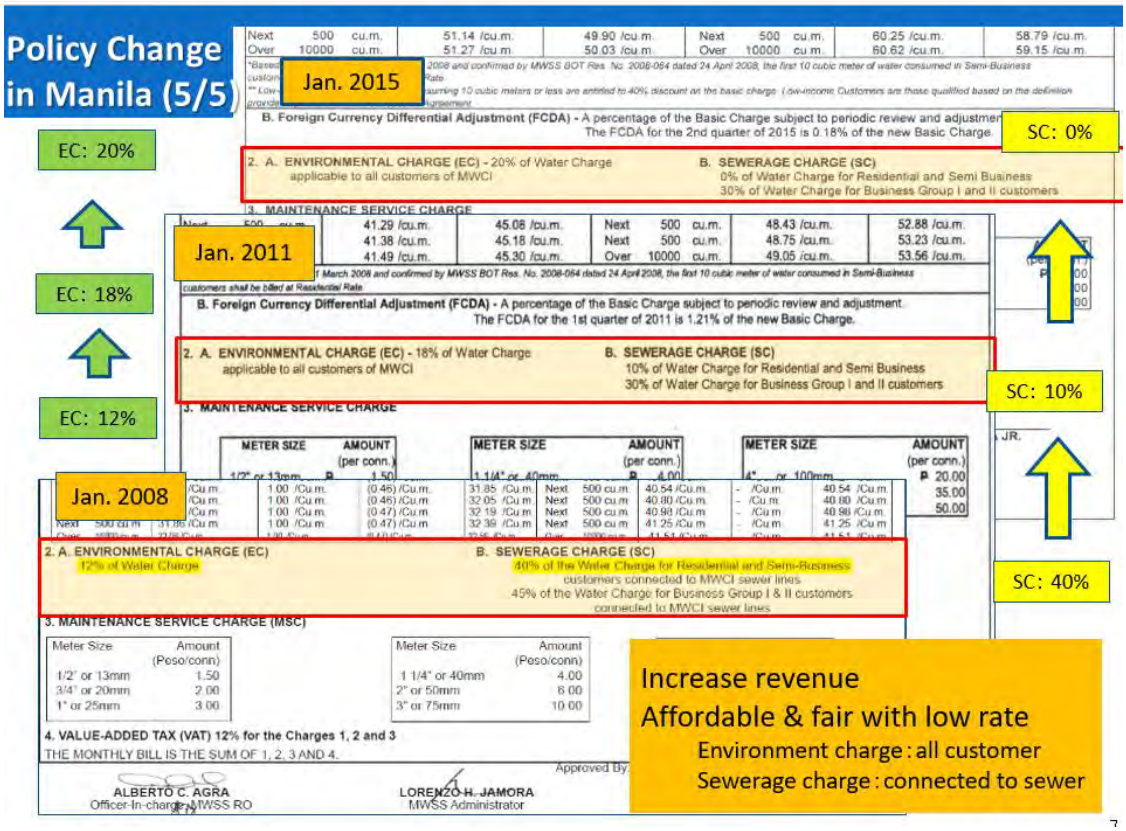
3 types of charge
(Water Supply, Environmental Charge and Sewerage Charge for Commercial

Tariff of Manila Water

4 Groups of Cross Subsidy and Progressive Rate
Residential, Semi-Business, Business I and Business II
3 types of charge
(Water Supply, Environmental Charge and Sewerage Charge for Commercial)

Tariff Change in accordance with Sewerage Development Policy

Tariff of Residents: EC (Environmental Charge), which is levied to whole water consumer, increased to 18% in 2011, 20% of water supply charge in 2015 from 12 % in 2008.
SC (Sewerage charge), which levied to house connection service, decreased to 0% from 40% in 2008.



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MWSS

MANILA WATER
CARE IN EVERY DROP

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Next 500 cu.m.	49.03 /cu.m.	48.34 /cu.m.
Next 500 cu.m.	49.29 /cu.m.	48.60 /cu.m.
Next 500 cu.m.	49.41 /cu.m.	48.71 /cu.m.
Next 500 cu.m.	49.54 /cu.m.	48.84 /cu.m.
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Next 100 cu.m.	50.03 /cu.m.	49.32 /cu.m.
Next 100 cu.m.	50.42 /cu.m.	49.71 /cu.m.
Next 100 cu.m.	50.80 /cu.m.	50.08 /cu.m.
Next 100 cu.m.	51.04 /cu.m.	50.32 /cu.m.
Next 100 cu.m.	51.42 /cu.m.	50.69 /cu.m.
Next 100 cu.m.	51.83 /cu.m.	51.10 /cu.m.
Next 200 cu.m.	52.09 /cu.m.	51.36 /cu.m.
Next 200 cu.m.	52.45 /cu.m.	51.71 /cu.m.
Next 200 cu.m.	52.69 /cu.m.	51.95 /cu.m.
Next 200 cu.m.	53.09 /cu.m.	52.34 /cu.m.
Next 200 cu.m.	53.45 /cu.m.	52.70 /cu.m.
Next 500 cu.m.	53.71 /cu.m.	52.95 /cu.m.
Next 500 cu.m.	54.10 /cu.m.	53.34 /cu.m.
Next 500 cu.m.	54.47 /cu.m.	53.70 /cu.m.
Next 500 cu.m.	54.72 /cu.m.	53.95 /cu.m.
Next 500 cu.m.	55.10 /cu.m.	54.32 /cu.m.
Next 500 cu.m.	55.49 /cu.m.	54.71 /cu.m.
Next 500 cu.m.	55.74 /cu.m.	54.95 /cu.m.
Next 500 cu.m.	56.12 /cu.m.	55.33 /cu.m.
Next 500 cu.m.	56.52 /cu.m.	55.72 /cu.m.
Next 500 cu.m.	56.74 /cu.m.	55.94 /cu.m.
Next 500 cu.m.	57.13 /cu.m.	56.32 /cu.m.
Next 500 cu.m.	57.38 /cu.m.	56.57 /cu.m.
Next 500 cu.m.	57.79 /cu.m.	56.98 /cu.m.
Next 500 cu.m.	58.15 /cu.m.	57.33 /cu.m.
Next 500 cu.m.	58.40 /cu.m.	57.58 /cu.m.
Next 500 cu.m.	58.79 /cu.m.	57.96 /cu.m.
Over 10000 cu.m.	59.15 /cu.m.	58.32 /cu.m.

**Based on IRR-2008-03 dated 31 March 2008 and confirmed by MWSS BOT Res. No. 2008-064 dated 24 April 2008, the first 10 cubic meter of water consumed in Semi-Business customers shall be billed at Residential Rate.*

*** Low-income residential customers consuming 10 cubic meters or less are entitled to 40% discount on the basic charge. Low-income Customers are those qualified based on the definition provided by Article 1 of the Concession Agreement.*

B. Foreign Currency Differential Adjustment (FCDA) - A percentage of the Basic Charge subject to periodic review and adjustment. The FCDA for the 1st quarter of 2016 is 0.59% of the new Basic Charge.

2. A. ENVIRONMENTAL CHARGE (EC) - 20% of Water Charge applicable to all customers of MWCI

B. SEWERAGE CHARGE (SC)
0% of Water Charge for Residential and Semi Business
30% of Water Charge for Business Group I and II customers

3. MAINTENANCE SERVICE CHARGE

METER SIZE	AMOUNT (per conn.)
1/2" or 13mm	₱ 1.50
3/4" or 20mm	2.00
1" or 25mm	3.00

METER SIZE	AMOUNT (per conn.)
1 1/4" or 40mm	₱ 4.00
2" or 50mm	6.00
3" or 75mm	10.00

METER SIZE	AMOUNT (per conn.)
4" or 100mm	₱ 20.00
6" or 150mm	35.00
8" or 200mm	50.00

4. VALUE-ADDED TAX (VAT) 12% of the Charges 1, 2 and 3

THE MONTHLY BILL IS THE SUM OF 1, 2, 3, and 4.

Approved by:

JOEL C. YU
Chief Regulator, MWSS-RO

Approved by:

GERARDO A. ESQUIVEL
Administrator, MWSS

GERARDO C. ABLAZA JR.
MWCI President

For further inquiries you may call Manila Water Company Hotline at 1627 or visit www.manilawater.com

(ii) Tariff of Tokyo, Japan

2 Groups of General Wastewater and Public-bath Wastewater
Progressive rate
Tariff for Pollution load which is obeyed to excessive concentration of BOD & SS on industrial wastewater discharger.

Conventional Sewerage Tariff in Japan

● Sewerage Service Charges (1 month): Right Table
※ The sewerage service charge is calculated by multiplying the figures in the above table by 1.08 (current consumption tax rate).
※ When not only tap water, but also well water is included in wastewater, the total figures in the above table are used to calculate the charge.

[Measuring wastewater discharge]
● Tap water
Wastewater is assumed to equal the amount of tap water used.
● Water other than tap water (i.e. well water)
A timer is placed on a water pump to record pumping time and calculate the amount of wastewater discharge.
※ Businesses whose wastewater amounts vary drastically from water use amounts (such as ice manufacturers) should consult with the Customers Service and Management Division of the Bureau of Sewerage at 03 (5320) 6573, or sewerage offices.

[Sewerage service charge exemptions]
Sewerage service charges are reduced in the following situations.
・Households living on public assistance.
・For public interest projects or in other special circumstances.

[Temporary Use]
When using the sewer system temporarily while performing construction, etc. the user must submit a notice for temporary usage. Please note that sewerage service charges will be applied for this usage.

Wastewater type	Volume (m^3)	Rate (Yen)
General wastewater	0~8m^3	560
	9~20m^3	110/m^3
	21~30m^3	140/m^3
	31~50m^3	170/m^3
	51~100m^3	200/m^3
	101~200m^3	230/m^3
	201~500m^3	270/m^3
	501~1,000m^3	310/m^3
	1,001m^3 and more	345/m^3
Public Bath wastewater	0~8m^3	280
	9m^3 and more	35/m^3

BOD & SS Tariff
Industrial wastewater discharger is obeyed to concentration of BOD & SS

(iii) Sewerage Finance Principle

- Role and effects of Sewerage Works prevail on private and community as well as region.
- Responsibility is allocated between beneficiaries between private and public.
- Beneficiary charge (Tax) is obeyed in accordance with benefits of sewerage works.
- Historically, Municipality Government shall provide own budget before requesting subsidies of National Government.
- Present financial system is financed through the allocation among private, municipal government and National Government.

Detailed Regulations for Enforcement
(1) Sewerage Charge Payment
- Forms of sewerage charge payment such as payment notice, application and approval of exemption & reduction, etc. including name of owner, address and telephone number of applicant, bank acount number and remittance, etc.

(2) Tariff Caluculation of Unmetered Water and Ground water use
- Formula of charged discharge wastewater

(3) Exemption and Reduction of Tariff Levy
- Requirement of exemption
- Requirement and rate of alleviation

【**Reference-7**】

Sewerage information database on topographic, structural, operation and maintenance.

Contents of sewerage information database

- Sewerage service area such as location and town name, served population, etc.
- Inauguration date of sewerage service
- Location of WWTP, pumping station and outlet
- Sewer information such as pipe length, location of man-hole, elevation, gradient, material
- Location, area, structure and capacity of wastewater treatment plant
- Location, area, structure and capacity of Pumping station

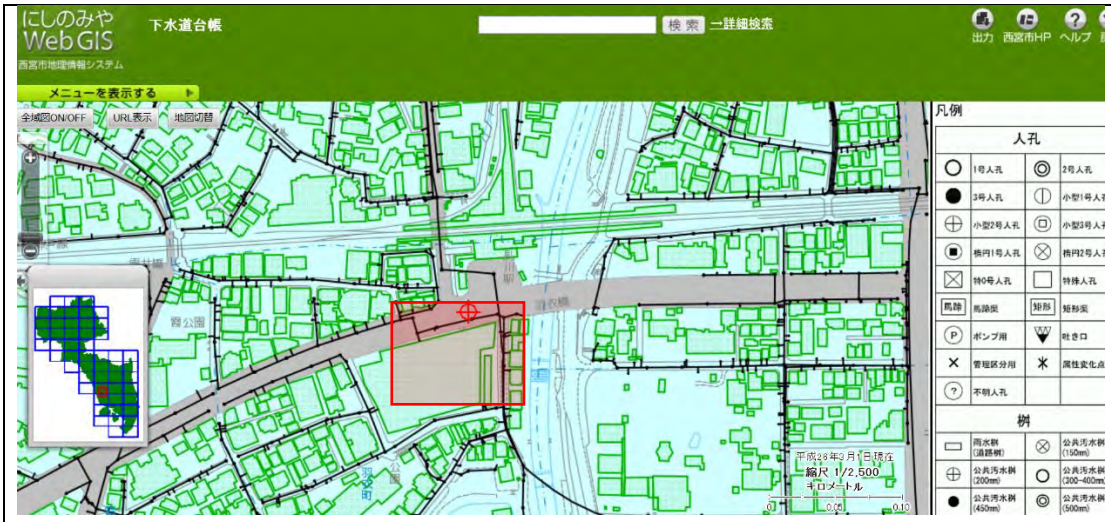
Role of sewer management

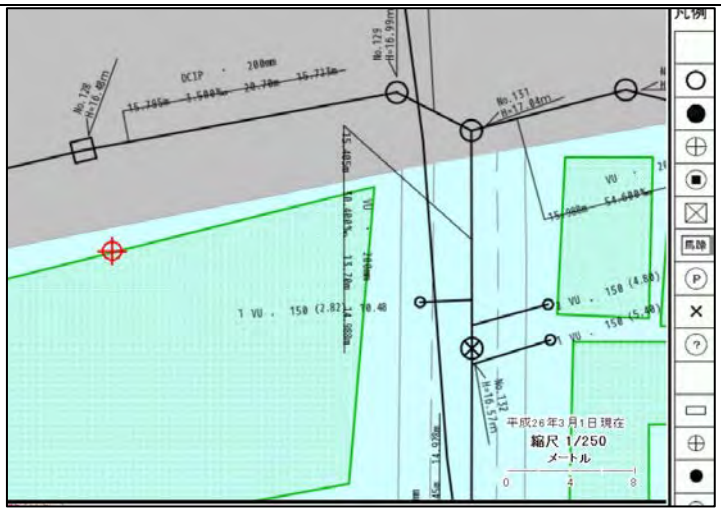
(1) Planning & Construction stage: Land occupation, Lay-out, Structural requirement

(2) O&M stage: HC approval, inspection & maintenance, Construction arrangement with adjacent building & utilities

 Pipe clogging	 Pipe cleansing
 Pipe crack	 Pipe crack
 Subsidy	 Traffic accident

Sewer Information Database





Data of mapping system

- Location of sewer, MH, IC
- Length & Gradient of sewer
- Elevation & Type of MH
- Material & ID of sewer
- Material & ID of HC
- Date of inauguration
- CCTV photo, O&M record

Detailed Regulations for Enforcement

(1) Principle
- To notify the sewerage facilities which shall be managed by sewerage operator
- To notify the sewerage service area
- To specify the location of wastewater discharge

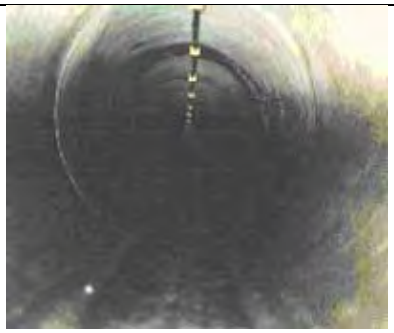
(2) Document
-Sewerage service area, sewer length, pumping station, WWTP, etc.

(3) Drawing
- Location of sewer, man-hole, inception chamber
- Length & Gradient of sewer
- Elevation & Type of MH
- Material & ID of sewer
- Material & ID of HC
- Date of inauguration

(4) O&M record
- O&M record on inspection, repairs, rehabilitation work
- CCTV photo

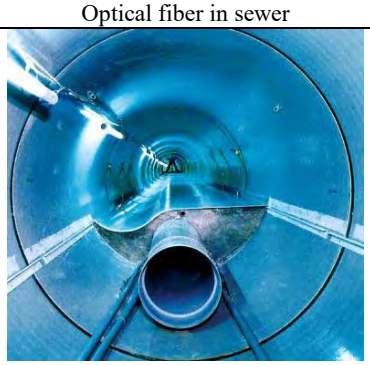
【Reference-8】
Occupation approval of sewerage facility, which sustains urban activities.

- Telecommunication using optical fiber for urban utilities as well as sewerage system operation.
- Multi-purpose use such as water supply, utility conduit, etc. Occupation charge is important revenue.
- Regulated use such as flood mitigation and traffic control of open channel, which sewerage sector owns.



Optical fiber in sewer

Optical fiber installation



Occupation in large diameter pipe
(multi-purpose use)

Open channel occupation
(flood control)

Detailed Regulations for Enforcement
(1) Application / Approval of Occupation
- Application Form of sewer occupation including name of owner, address and telephone number of applicant, bank account number and remittance, etc.
- Business type
- Duration of occupation and condition on termination, etc.
- Fee of occupation,
- Prohibition and penalty

(2) Document and drawing
- Drawing of location, structure, material, caluculation documents, etc.

(3) Reporting
- Operation record, inspection, maintenance, etc.

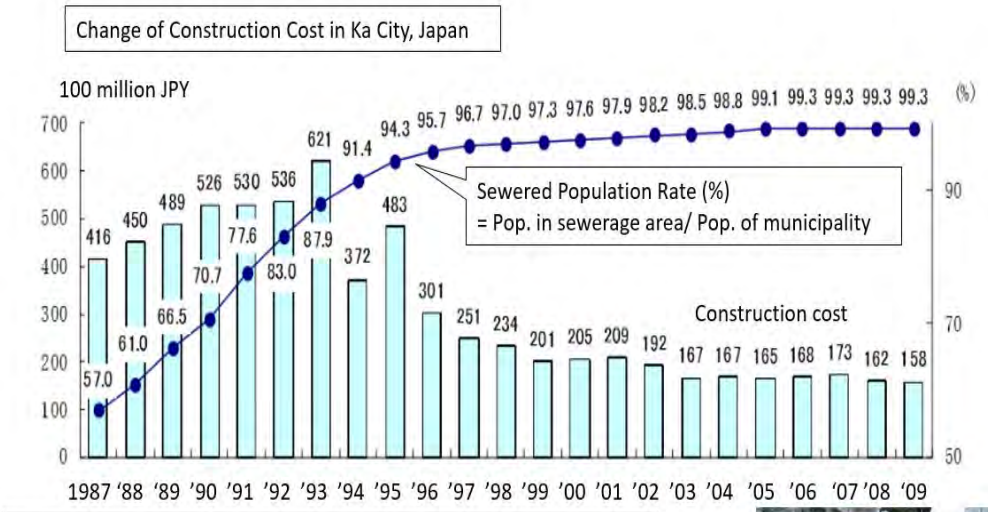
【Financial System】

Financial system is designed to secure project needs, the responsibility and benefit of sewerage user, affordability and role as urban infrastructure.

(i) Change of Project Investment Cost

Project needs

- Sewerage construction (sewer, pumping station, WWTP)
- Replacement of machinery
- Repair & fixing
- Rehabilitation
- Expansion of capacity accordant with urban development
- Upgrading of sewer and WWTP accordant with life style change

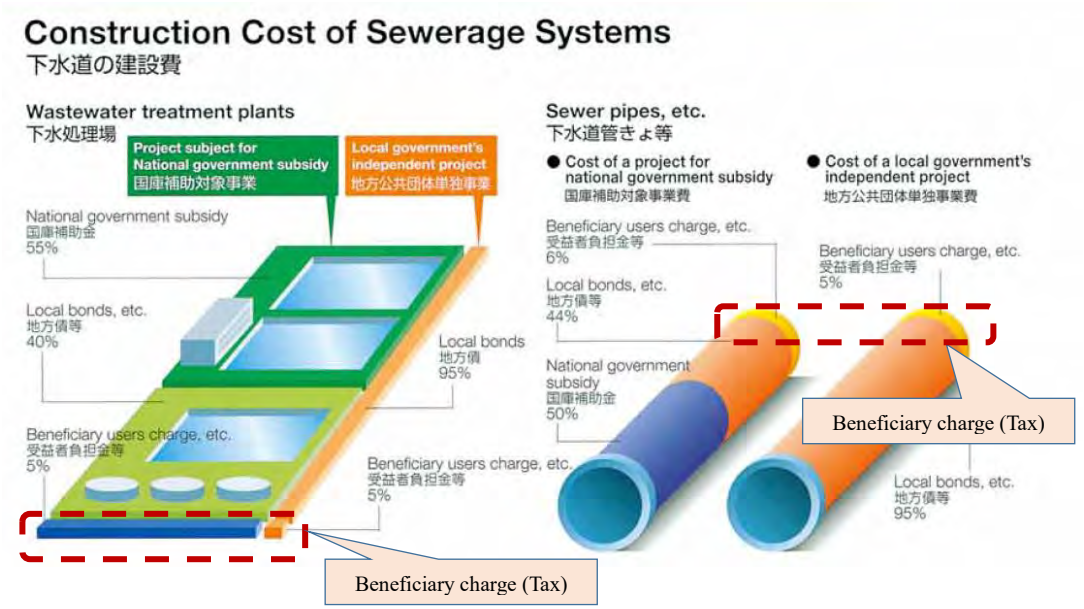


Construction Project for;
(1) Expanding sewerage service area
(2) Up-grading drainage system (Storm water flood mitigation)
(3) Rehabilitation / replacement of sewer
(4) Rehabilitation / replacement, up-grading WWTP & pumping station
(5) Other investment cost

(ii) Sewerage Finance Principle

- Role and effects of Sewerage Works prevail on private and community as well as region.
- Responsibility is allocated between beneficiaries between private and public.
- Beneficiary charge (Tax) is obeyed in accordance with benefits of sewerage works.
- Historically, Municipality Government shall provide own budget before requesting subsidies of National Government.
- Present financial system is financed through the allocation among private, municipal government and National Government.

(iii) Financial Source and Use of Beneficiary Tax



(iv) Beneficiary Tax

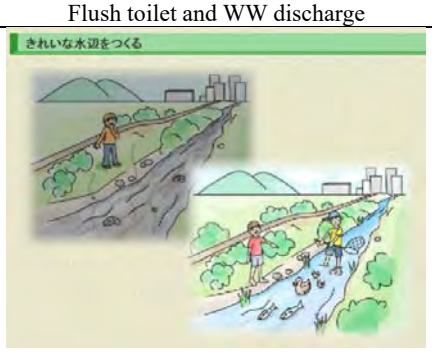
Role of Sewerage: Sanitation, Human waste disposal, Water environment conservation
Legal Background: Urban Planning Law for Benefits of resident
Levy and collection type: One-time-only levied based on property area (m^2)

Role of Sewerage Works

Sanitation and living environment

Flush toilet and WW discharge

Inundation mitigation



Clean water environment

Figure Role of Sewerage System

Benefit of sewerage

- Improved sanitation
- Improved water front & amenity
- Improved transportation
- Inundation mitigation

Before sewerage 2009
Foaming & blackish water

After sewerage 2014
No offensive odor & aesthetic water front

(v) Demarcation of Financial Source

- Principle of Stormwater and Wastewater Management
  Stormwater drainage: Role of administration for natural disaster prevention.
  Wastewater management: Role allocation shall be designed carefully to responsibilities on public of water environment conservation and aesthetic urban development, and to private on sanitation improvement in private entity.

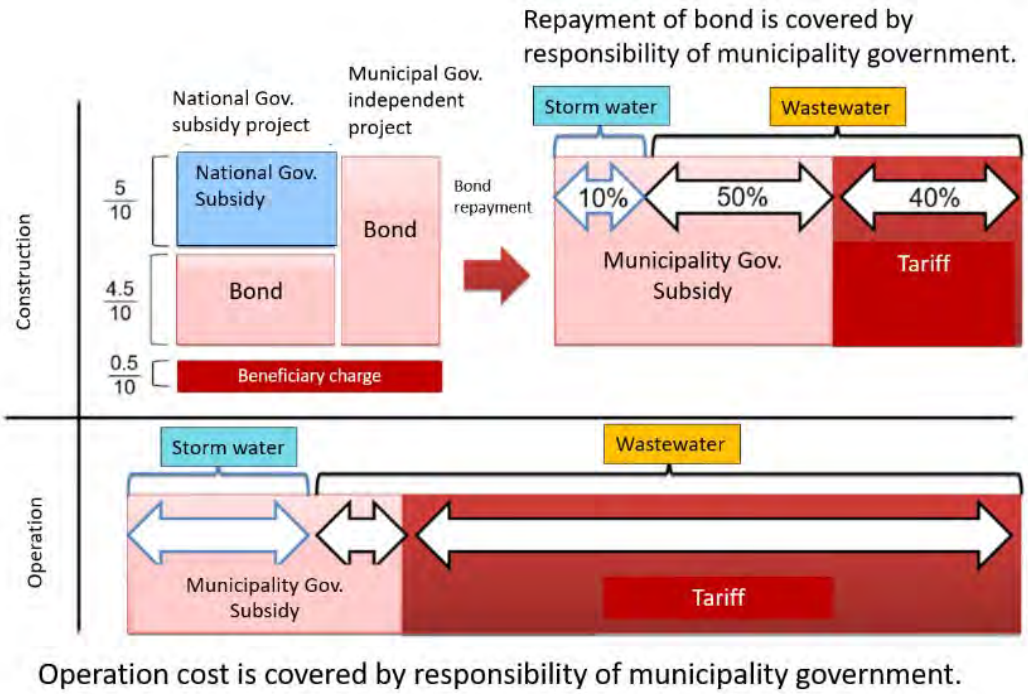
- Repayment of Bond invested to Construction
  Stormwater: Financed by Government (Tax)

Wastewater: Financed by Tariff and Municipal Government subsidy to which National Government financially supports for balanced development across country.

- O&M Cost

  O&M cost is a responsibility of Municipality.
  Stormwater: Financed by Government (Tax)
  Wastewater: Financed by Tariff, however Municipal government subsidies for a part of water quality management in public water course.

Allocation of Financial Source



Part-5 Appendix

Appendix-1 Standard Sewerage Ordinance of Municipality Government in Japan

<table>
<tr><td></td><td>Chapter 1
General Provisions</td></tr>
<tr><td>Article 1
Purpose</td><td>Administration and management of sewerage works are stipulated by the Sewerage Ordinance as well as Sewerage Law in Japan and relevant regulations of National Government.</td></tr>
<tr><td>Article 2
Definition of Terms</td><td>Terms following items mean:
a. Sewage (wastewater and storm water) and wastewater are defined in Item 1, Article 2 of Sewerage Law.
b. Public sewerage system is defined in Item 3, Article 2 of Sewerage Law.
c. Regional sewerage system is defined in Item 4, Article 2 of Sewerage Law.
d. Wastewater treatment plant is defined in Item 6, Article 2 of Sewerage Law.
e. House connection and Private sewer are defined in Item 1, Article 10 of Sewerage Law.
f. Specified facility of industrial wastewater treatment is defined in Item 2, Article 2-2 of Sewerage Law.
g. Industrial pretreatment facility is defined in Item 1, Article 12 of Sewerage Law.
h. Specified factory is defined in Item 1, Article 12-2 of Sewerage Law.
i. Sewerage user is defined to person who discharges sewage (wastewater and storm water) into public sewerage system.
j. Water supply and plumbing are defined in Item 1 and Item 9, Article 3 of Water Supply Act respectively.
k. Sewerage service month means almost one month for sewerage tariff levy, and inauguration and termination of sewerage service are defined by Order.</td></tr>
<tr><td></td><td>Chapter 2
Installation of House Connection and Private Sewer</td></tr>
<tr><td>Article 3
Installation of House connection and private sewer</td><td>Person, who shall install house connection and private sewer at inauguration date of sewerage service, shall connect to public sewer within ** days.</td></tr>
<tr><td>Article 4
Installation of house connection, pipe diameter of private sewer and others</td><td>Installation, expansion and/or rehabilitation (herein after “installation work”) of house connection and private sewer are stipulated in Items followings:
a. Private sewer, which discharges wastewater into separate public sewer, shall fix with public inlet of sanitary sewer. Private sewer, which discharges storm water into separate public sewer, shall fix with public inlet of storm sewer.
b. Private sewer, which discharges sewage into combined public sewer, shall fix with public inlet of combined sewer.
c. Private sewer shall be fixed with public sewer where function and facility of public sewer are not affected. Fixing shall follow standard operating procedure.
d. Diameter and gradient of sanitary private sewer shall be designed in principle on the basis of following Table. Flow capacity and diameter of private sewer shall comply respective design dimension. In case less than three meter length of private sewer of one building, 75 mm of diameter pipe can be applied.

<table>
<tr><th>Service population (person)</th><th>Pipe diameter (mm)</th><th>Gradient</th></tr>
<tr><td>Less than 150</td><td>100 and more</td><td>2/100 and more</td></tr>
<tr><td>150 and more,
less than 300</td><td>125 and more</td><td>1.7/100 and more</td></tr>
<tr><td>300 and more,
less than 500</td><td>150 and more</td><td>1.5/100 and more</td></tr>
<tr><td>500 and more</td><td>200 and more</td><td>1.2/100 and more</td></tr>
</table>

e. Diameter and gradient of storm and combined private sewer shall be designed in principle on the basis of following Table. Flow capacity and diameter of private sewer shall comply with respective</td></tr>
</table>

<table>
<tr><td></td><td>design dimension. In case less than three meter length of private sewer of one property, 75 mm of diameter pipe can be applied.

<table><tr><th>Drainage area (m²)</th><th>Pipe diameter (mm)</th><th>Gradient</th></tr><tr><td>Less than 200</td><td>100 and more</td><td>2/100 and more</td></tr><tr><td>200 and more,
less than 400</td><td>125 and more</td><td>1.7/100 and more</td></tr><tr><td>400 and more,
less than 600</td><td>150 and more</td><td>1.5/100 and more</td></tr><tr><td>600 and more,
less than 1500</td><td>200 and more</td><td>1.2/100 and more</td></tr><tr><td>1500 and more</td><td>250 and more</td><td>1/100 and more</td></tr></table></td></tr>
<tr><td>Article 5
Approval of private sewer construction plan</td><td>1. Person, who installs private sewer, shall apply necessary documents of construction plan and be approved in advance by Mayor of City accordant with the stipulation of house connection and private sewer installation.
2. Person, who alters private sewer construction plan, shall apply necessary documents of alteration plan and be approved in advance by Mayor of City. In case of no structural alteration of private sewer, person can cope with reporting to Mayor of City.</td></tr>
<tr><td></td><td>Chapter 3
Order on Construction Works of House Connection and Private Sewer</td></tr>
<tr><td>Article 6
Registration of plumber</td><td>1. Any construction work related to the house connection and private sewer installation shall not be done by anyone else except the licensed plumber.
2. Terms of validity of plumber license is ** years from the date of registration.
3. Registration shall be renewed in case to continue the licensed plumber due to license expiration.</td></tr>
<tr><td>Article 6-2
Application of registration</td><td>1. Registration prescribed in Item 1, Article 6 shall be done by the application of person who works for private sewer construction.
2. Person, who applies registration, shall submit the following documents to Mayor of City.
a. Name and/or trade name, and address. Authorized representative in case of corporation.
b. Name and address of business office as well as name of professional engineer who belongs exclusively to the office.
3. Application for Item 2, this Article submits documents followings;
a. Written oath not applicable to Item 4, Article 6-3.
b. Certified copyofarticles of corporation orendowment and the register, a copy of certificate of residence and/or alien registration in case of individual.
c. Layout plan, photo and sketch of business office
d. A copy of certificate prescribed in Article 6-9 of professional engineer who belongs exclusively to the office
e. Equipment and machinery list stipulated in b. Item 1, Article 6-3</td></tr>
<tr><td>Article 6-3
Requirement of registration</td><td>1. Mayor of City approves the plumber registration in accordance with requirements followings:
a. One and more professional engineers exclusively belong to the respective business office stipulated in Article 6-4.
b. Business office who provides equipment and machinery stipulated by the regulation.
c. Business office located in respective prefecture/province.
d. Not applicable to followings;
- An adult ward or a person under curatorship, or a bankrupt who has not obtained a restoration of rights.
- Less than two years since license is revoked by Item 1, Article 6-13.
- Person with a considerable reason that he/she is likely to engage in illegal or dishonest work.
- Corporation who employs not applicable person prescribed above.
2. Administrator punctually notifies the plumber registration to public when the plumber application is approved.</td></tr>
<tr><td>Article 6-4</td><td>1. Registered plumber office shall exclusively employ a professional engineer registered in Article 6-5</td></tr>
</table>

Professional engineer of plumbing	to the respective business office in order to assign jobs following. 2. Professional engineer shall perform following duties faithfully; a. Technical management on private sewer construction. b. Technical supervision on workers engaged to private sewer construction. c. Certification of private sewer in accordance with the stipulation on installation and structure. d. Attendance on private sewer installation stipulated Article 7 3. Workers engaged to private sewer construction shall obey the direction of professional engineer.
Article 6-5 Registration of professional engineer	1. Mayor of City registers professional engineer in accordance with Item 1, Article 6-4. 2. Duration of validity of Item 1, this Article is ** years. 3. Registration shall be renewed in case to continue the licensed plumber due to license expiration.
Article 6-6 Application of professional engineer registration	Person, who applies for the registration stipulated in Item 1, Article 6-4, shall submit the following documents to Mayor of City. a. A copy of certificate of residence and/or alien registration. b. Certification of professional engineer examination stipulated in Item 1, Article 6-7. c. Written oath not applicable to Item 2, Article 6-7.
Article 6-7 Requirement on professional engineer registration	1. Person, who passed the professional engineer examination, acquires the certification of professional engineer registration. 2. Mayor of City has the right to reject the application of professional engineer in accordance with followings: a. An adult ward or a person under curatorship, or a bankrupt who has not obtained a restoration of rights b. Less than two years since license is revoked by Item 3 in this Article. 3. Mayor of City can revoke the registration or suspend the validity of the registration of professional engineer in case that the registered professional engineer violates the Sewerage Ordinance.
Article 6-8 Professional engineer examination	1. ****** executes the professional examination in accordance with knowledge and technique required for professional engineer. 2. Regulation prescribes the eligibility requirements for examination, the subject of test, the examination procedure and the other details for the implementation of professional engineer examination.
Article 6-9 Certificate of professional engineer	1. Mayor of City registers to the professional engineer and issues the certificate in accordance that a person eligible to Item 1, Article 6-7 applies the professional engineer registration stipulated in Article 6-6. 2. Professional engineer shall carry the certificate and show ones whenever municipal officer requests during engaging in private sewer construction work. 3. Professional engineer shall return the certificate which is revoked due to stipulation on Item 3, Article 7 as well as the validity suspended. 4. Regulation prescribes the necessary procedure for 1-3 Items, this Article as well as the renewal and the reissuance.
Article 6-10 Certificate of plumber registration	1. Mayor of City issues certificate of plumber to registered corporation. 2. Plumber shall display certificate on clearly visible location in business office. 3. Registered plumber shall punctually return certificate to Mayor of City when the registration is revoked as well as suspended validity. 4. Regulation prescribes necessary procedure for 1-3 Items, this Article as well as renewal and reissuance.
Article 6-11 Responsibility and norm	Registered plumber shall execute private sewer construction work properly in accordance with Law, Ordinance and regulations of sewerage.
Article 6-12 Notification of change	Registered plumber shall notify the changes to Mayor of City such as name of business office, address and others stipulated by regulation as well as closure, suspension or resumption of business.
Article 6-13 Revocation and suspension	1. Mayor of City can revoke the registration or suspend the business for less than ** months in case applicable to following:

of registration	a. Not applicable to Item 1, Article 6-3. b. Violating Item 1, Article 6-4. c. There is considerable reason that plumber cannot execute the private sewer construction work properly in accordance with the responsibility or norm stipulated in Article 6-11. d. There is no notification stipulated in Article 6-12 or false statement. e. Executed private sewer construction affects a damage as well as a considerable reason on malfunction to public sewerage. f. Registration of Item 1, Article 6 through false procedure. 2. Stipulation of Item 2, Article 6-3 is applied to Item 1, this Article.
Article 7 Inspection of private sewer installation	1. Person, who installed private sewer, shall notify the completion of construction work to Mayor of City within ** days, and accept the inspection of city officer in accordance with the regulation on private sewer installation and structure. 2. City office issues the certificate of inspection to owner of private sewer since the installed private sewer complies with the regulation on private sewer installation and structure.
	Chapter 4 **Drainage to Public Sewer**
Article 8 Installation of pretreatment facility	1. Person, who discharges wastewater not complying with the stipulation of Item 1, Article 12 of Sewerage Law, shall install the pretreatment facility or carry out the appropriate measure. Table is omitted due to confuse understanding. Accordingly, Table is replaced to wastewater discharge requirement of large city. 2. Item 1, this Article exempts person who discharges daily average flow less than ** m^3.
Article 9 Restriction on wastewater discharge of specified factory	Person, who discharges wastewater not complying with the stipulation of Item 3 and 5, Article 12-2 of Sewerage Law, shall not discharge wastewater followings; Table is omitted due to difficult to understand. Accordingly, Table is replaced to wastewater discharge requirement of large city.
Article 10 Installation of pretreatment facility	Omitted due to prescription on public sewerage connected to Regional sewerage system This Article is omitted due to confuse understanding. Accordingly, Table is replaced to wastewater discharge requirement of large city.
Article 11 Water quality management professional	Person, who installed pretreatment facility or specified facility, shall assign the water quality management professional and punctually notify to Mayor of City in accordance with stipulated regulation. Water quality management professional works for operation and maintenance of pretreatment facility or specified facility.
Article 12 Notification of pretreatment facility installation	Person, who installs, suspends or removes pretreatment facility, shall notify to Mayor of City in accordance with the stipulated regulation. Dischargers, who changes notified matters, shall notify amended plan.
Article 13 Suspension or restriction of wastewater discharge	Mayor of City can suspend and/or restrict drainage to public sewer in case applicable to following: a. Discharger may be liable to damage sewerage facility. b. Discharger may be liable to affect treatment function. c. In any other case where it is found necessary for sewerage management.
Article 14 Notification of public sewer use	1. Person, who starts, suspends or resumes discharge, or abandons the private sewer, shall notify the effect to Mayor of City in advance accordant with the regulation. In case of only storm water discharge, notification of discharge is not required. 2. Person, who applied to Articles of 11-2, 12-3, 12-4 or 12-7 of Sewerage Law, is deemed to one who notified in accordance with Item 1, this Article.
Article 15 Tariff collection	1. Mayor of City levies sewerage charge on sewerage discharger. 2. Sewerage charge is collected through the method of bill collector, postal transfer form or account transfer in accordance with discharge at every month. 3. Sewerage charge shall be paid within ** days after the end of the previous month. 4. Sewerage charge of discharges from construction works or the other temporary work can be paid in advance if necessary. Bill clearance and succeeding repayment and/or additional imposition will be transacted when the discharger notifies the abandonment of private sewer to Mayor of City.
Article 16	1. Sewerage charge is determined based on the tariff in Table below accordant with the amount of

Tariff calculation	discharged wastewater. 2 Amount of discharged wastewater is determined in accordance with followings: a. Amount of wastewater consumed water supply is deemed to the amount of supplied water. However, in case of two dischargers using one tap together and furthermore not able to determine the individual wastewater amount, Mayor of City will determine the allocated wastewater amount in accordance with water consumption manner. b. Amount of wastewater consumed other than water supply is determined to the actual consumed amount, and Mayor of City determines the amount in accordance with water consumption manner. c. Ice maker and the other business, who remarkably discharge less than supplied water, shall submit the documents of discharged wastewater amount and calculation basis in accordance with the regulation within ** days from the last day of each month. Mayor of City certifies the amount of discharged wastewater accordant with the submitted document in spite of Item 2, this Article. 3. In case that person who starts, suspends or resumes discharge, or abandons private sewer in the middle of the month, sewerage charge is calculated to one month charge.
Article 17 Request of data submission	Mayor of City can request the documents within necessary extent in order to determine sewerage charge.
	Chapter 5 **Miscellaneous**
Article 18 Order for improvement	Mayor of City have a right of order to improve the structure and/or the operating practice of private sewer and pretreatment facility. Improvement work shall be completed in the designated duration.
Article 19 Approval of activity	Person, who applies the approval stipulated in Term 1, Article 24 of Sewerage Law (occupation and use of sewerage), shall submit the application form with drawings below. Person, who alters the licensed matter, shall also submit the application form. a. Layout plan describing the location of facility and/or other property excluding private sewer. b. Layout plan and structure of facility.
Article 20 Amendment not required approval	Minor changes stipulated in in Term 1, Article 24 of Sewerage Law (occupation and use of sewerage) means the additional attachment which, locates on the land, does not prevent the sewerage function nor affect sewerage facility. And construction works shall be performed in accordance with the licensed purpose of occupation and use of sewerage.
Article 21 Occupation	Person, who installs objects in land and facility of sewerage and continuously occupies, shall submit the application form and accept the approval in accordance with the regulation. Person, who alters licensed matter, shall also submit the application form. a. Purpose of occupation of land and facility of sewerage. b. Duration of occupation of land and facility of sewerage. c. Location of occupation of land and facility of sewerage. d. Structure of occupier e. Plan of construction work f. Duration of construction work g. Restoring method of public sewerage 2 Mayor of City levies occupation charge on person approved by Term 1, this Article.
Article 21-2 Survey on use of closed conduit	1. Person, who installs the electric cable in closed conduit and continuously uses drainage system, shall apply the survey plan to Mayor of City in order to confirm the feasibility of sewerage use. 2. In case applied in accordance with Item 1, this Article, Mayor of City directs the survey method, if necessary, to person who applies the survey plan.
Article 21-3 Use of closed conduit	Person, who installs the electric cable and uses the sewerage facility, shall submit the application form and accept the approval in accordance with the regulation. Person, who alters the licensed matter, shall also submit the application form. a. Purpose of use of closed conduit. b. Duration of use of closed conduit. c. Locations of use of closed conduit and installed area of electric cable. d. Structure of electric cable e. Plan of construction work f. Duration of construction work g. Restoring method of sewerage facility

	2 In case that applicant executed by himself the survey stipulated in Article 21-2, the survey result shall be attached with the application form stipulated in Term 1, this Article.
Article 21-4 Requirement for use of closed conduit	1. Mayor of City can approve the use of closed conduit in case that application complies with whole requirements followings; a. Electric cable applied to use of closed conduit complies the technical requirements followings in this Items: - Area, where electric cable occupies, does not affect the wastewater drainage nor prevent the sewer operation. - Rate of areas of electric cable and closed conduit as well as number of cables do not affect the wastewater drainage nor prevent the maintenance of sewer. - Structure of electric cable is robust and smooth surface as well as durable, corrosion resistance and water proof. - Sand, soil, sludge and others do not deposit nor prevent remarkably the drainage due to installed electric cable. - Electric cable does not receive voltage in principal. - No other obstacle for sewer operation b. Methods provided by the applicant for construction works and operating practice of electric cable complies with the requirement on construction work and operating procedure. c. Application is not revoked due to the responsibility of applicant (including executive directors such as director, advisor and/or staffs involved to the application within 60 days before the revoked date). d. In case of corporation, there is no revoked directors stipulated in 3. Item 1, this Article. e. In case of personnel, there is no revoked directors stipulated in 3. Item 1, this Article. f. Applicant will not violate the regulation. g. In case that the use of closed conduit is stipulated by the Road Law and the other laws for public infrastructure management, occupation can be permitted (including alteration). h. There is an existing plan of electric cable for sewerage management and other public service in proposed closed conduit as well as the applied electric cable plan available for joint construction work. 2. Mayor of City will determine the approval or the rejection within one month after application. 3. In case that the determination is not concluded on the approval or the rejection, Mayor of City will notify the written reason to applicant. 4. In case of the rejection stipulated in Item 1, this Article, Mayor of City will notify the written reason to the applicant. 5. Mayor of City levies the user charge of closed conduit to the applicant.
Article 21-5 Requirement of approval	Mayo of City issues the requirement of approval stipulated in Item 1, Article 21-4 a. In case to suspend the use of closed conduit due to own responsibility, the applicant shall remove the electric cable and restore the closed conduit by own expense. b. In case not to renew the closed conduit use at expiration of permission, the applicant shall remove the electric cable and restore the closed conduit by own expense. c. In case of revocation of the closed conduit use, the applicant shall remove the electric cable and restore the closed conduit by own expense.
Article 21-6 Duration of occupation	Duration of the occupation of land and facility of sewerage stipulated in Article 21-1 is five years or less.
Article 21-7 Duration of closed conduit use	1. Duration of the closed conduit use stipulated in Item 1, Article 21-3 is five years or less. 2. Mayor of City approves the closed conduit use in case that the owner of electric cable applies the renewal of use in advance to expiration of the licensed use and the application complies with the requirements stipulated in Item 1, Article 21-4. However, the application of renewal may be rejected in case that Mayor of City admits the reasonable excuse.
Article 21-8 Revocation of approval	Mayor of City can revoke in any of the requirement followings; a. Existing electrical cable installed in closed conduit does not comply with the requirement stipulated in Item 1, Article 21-4. b. User charge of the closed conduit is not paid. c. Electric cable has not been installed within the duration of closed conduit use. d. Closed conduit use is approved through false statement. e. Actual situation is significantly different from the application.

	f. User of closed conduit violates the requirement of approval. g. Mayor of City admits an inevitable reason for removing the electric cable due to public benefit.
Article 22 Restoration	1. Occupier shall remove his property and restore the closed conduit in case that the approval of occupation expires and/or the occupation is not required. However this Article may be not applied in case that Mayor of City admits the reasonable excuse.
Article 23 Fee	1. Mayor of City charges the fees of application in the following amounts; a. *** JPY for one registration of professional engineer b. *** JPY for one registration of plumber 2. Fees stipulated in Item 1, this Article are levied at the time of application. 3. Paid fee is not reimbursed.
Article 24 Demand of user charge	1. Mayor of City demands the recovery of arrears attached with the demand letter in accordance with the regulation to a person who does not pay by due date. 2. Due date of the recovery of arrears stipulated in Term 1, this Article is within ** days after the demand letter issued. 3. Fee for the demand letter is levied to *** JPY per one demand. 4. Penalty fee of the arrears is levied by calculation of daily pro-rate of ** % per year.
Article 25 Reduction of and exemption from user charge	Mayor of City can reduce or exempt from the user charge, fee of recovery and/or arrears if necessary due to the public interest and the special circumstances.
Article 26 Commission to regulation	Omitted
	Chapter 6 **Penalty**
Article 27 Application of penalty	Penalty of 50,000 JPY or less is levied to the violations followings; a. Private sewer installation, rehabilitation, etc. without the approval stipulated in Article 5. b. Private sewer installation, rehabilitation, etc. violating the stipulation in Article 6. c. Registered professional engineer stipulated in Article 6-5 by false and wrongful means. d. Person without notification within due date stipulated in Item 1, Article 7 for the private sewer installation, rehabilitation, etc.. e. Person who violates the stipulation in Article 8 and Article 10. f. Person without notification stipulated in Article 12. g. Person who rejects or neglects the submission of documents stipulated in Article 17. h. Person who violates the order stipulated in Article 18. i. Person who does not obey the directions stipulated in Item 2, 3 or 4 in Article 22. j. Persons who submit the false documents stipulated in Item 1 in Article 5, Article 19, Item 2 in Article 5, Article 12, Article 14, c of Item 2 in Article 16 or Article 17.
Article 28 Rate of correctional fine	Omitted
Article 29 Correctional fine on corporation	Omitted

Appendix-2 Sewerage Law in Japan (Draft)

Article 1	**Objective of the Law**
	In this article, three different levels of objectives are described. The direct objective is stipulation of master planning and standards for design, build & operation of sewerage system. This enables the expansion of sewerage system, which is refereed as the medium objective. It leads to the highest level of objective or supreme goal of the law, which includes sustainable urban development, sanitation, and water pollution control.
Article 2.1	**Definition of Term**
Article 2.2	**Master Plan (Comprehensive Basin-wide Sewerage Plan)**
	2.2.1 Prefecture Gov. shall provide a sewerage master plan for a public water body where environmental quality standards are set by Environmental Law. The master plan shall include sewerage systems to achieve EQSs (Environmental Quality Standards).
	2.2.2 Master Plan shall decide following items i. Principle of sewerage development ii. Sewerage areas of wastewater discharge and treatment iii. Lay-out, structure and capacity of principal sewerage facilities iv. Priority of project implementation of individual sewerage area in "ii" in this Item. v. Target value and treatment process of nitrogen and phosphorus removal of individual waste water treatment which is decided to sustain the water quality in public water body stipulated in Item 2.2.1.
	2.2.3Master plan shall be provided in accordance with following items. i. Topography, precipitation, river flow and other natural condition in planning area ii. Perspective land use in planning area iii. Perspective water use of public water body in planning area iv. Perspectives of produced flow-rate and quality of wastewater in planning area v. Condition of wastewater effluent discharge point vi. Cost benefit analyses on sewerage development
	2.2.4 – 2.2.9 Omitted
Article 3	**Operator of Municipal Sewerage**
	3.1 Municipal government shall design, build, operate, and maintain municipal sewerage. 3.2 Omitted
Article 4	**Implementation Program**
	4.1 Municipal sewerage operator shall make an implementation program when they start a sewerage project.
	4.2 Municipal sewerage operator shall consult with prefecture gov. upon making the implementation program.
	4.3 – 4.6 Omitted
Article 5	**Contents of implementation program**
	Implementation program of Article 4 shall decide following items.
	5.1.1 Lay-out, structure and capacity of sewerage facilities, and planned sewerage area
	5.1.2 Location, structures, & capacities of WWTPs or connection spot to prefecture sewerage
	5.1.3 Lay-out, structure and capacity of supplemental treatment facility if necessary
	5.1.4 Dates of commencement &completion of construction works

	5.2 Requirements for form of project implementation program stipulated in Article 4 shall be prescribed in Circular.
Article 6	**Requirements of implementation program**
	6.1 Location & capacity of sewerage shall be decided by considering precipitation, population, and others that affect quality and quantity of sewage, geography, land use, and conditions of receiving waters.
	6.2 Structure of sewerage shall conform to the Article 7.
	6.3 Treatment area shall harmonize with the location & capacity of collection system & WWTP.
	6.4 The implementation program of municipal sewerage connecting to prefecture sewerage shall harmonize with the implementation program of prefecture sewerage.
	6.5 The implementation program shall harmonize with the master plan if any.
	6.6 Facility layout plan and duration of project implementation of the implementation program shall coincide with urban planning and/or urban project implementation program.
Article 7	**Structural Requirement**
	7.1 The structure of municipal sewerage shall conform to the technical requirements stipulated in the order of the sewerage law in order to keep sanitation and to secure pollution control.
	7.2 The structure of municipal sewerage shall conform to the technical requirements stipulated in the municipal law based on the order.
Article 8	**Effluent Quality Standard**
	The effluent quality standard of municipal sewerage shall satisfy the requirements made by the order of sewerage law.
Article 9	**Public Notice of Commencement of Sewerage Service**
	Municipal sewerage operator has to issue a public notice on the dates of commencement of new sewerage service, drainage/treatment area, and the others stipulated in the ordinance of sewerage while ensuring public access to the plans & sections in the offices of municipal governments.
Article 10	**Mandatory Connection**
	10.1 Once sewerage service becomes available, land owners, tenants, or occupants shall install house or lateral sewers without delay by the following classification.
	10.1.1 Where a land has a building, the building owner has the duty.
	10.1.2 Where a land does not have a building, the land owner has the duty.
	10.1.3 Where a land is public roads or used by other public authorities, the concerned authorities have the duty.
	10.2 The repair & rehab of house or lateral sewers shall be made by those who shall install them. The cleaning and other maintenance work shall be conducted by the occupants of the land.
	10.3 The installation work & structure of house or lateral sewers shall comply with Building Law & the Order of Sewerage Law.
Article 11.1	**Mandatory Acceptance of Sewage from Other Property**
	11.1.1 Those who shall connect sewage into public sewerage can use land and house sewers of others if necessary. In this case, minimum disturbance to the property of others shall be kept.
	11.1.2 Those who use sewers of the others shall bear the cost of installation, rehabilitation, and repair in accordance with the benefits they receive.
	11.1.3 Those who can install in other property stipulated in 11.1.1 or those who shall manage house sewer shall use other property in case of installation, rehabilitation, repair or maintenance. Those

	shall inform owner of other property on activity plan in advance to work.
	11.1.4 Those who can occupy other property stipulated in 11.1.3 shall compensate loss in case of imposing loss.
Article 11.2	**Application of wastewater discharge**
	11.2.1 Those, who shall discharge wastewater complying with requirements stipulated in decree, shall apply flow-rate and quality of wastewater and date of inauguration to public sewerage operator. In case to change flow-rate or quality, discharger shall apply the change of wastewater.
	11.2.2 Those, who do not apply the Approval of Item 11.2.1 and owns specified facility designated by Water Pollution Control Law and Special Act on Dioxin, shall apply the date of inauguration to public sewerage operator.
Article 11.3	**Obligation on Installation of Flush Toilet**
	11.3.1 Those, who own a building facilitated with pit latrine, shall renovate to flush toilet within three years after notification of sewerage service inauguration stipulated in Article 9.
	11.3.2-11.3.4 Omitted
	11.3.5 Municipal government shall task to finance, mediate, settle or provide other support to building owner who rehabilitates to flush toilet.
	11.3.6 Central Government shall task to finance or mediate the municipal government who provides financing stipulated in Article 11.3.5.
Article 12.1	**Installation of Pretreatment**
	12.1.1 Municipal sewerage operator can stipulate in the local ordinance that those who discharge wastewater with the possibility of damaging sewerage system shall build a pretreatment system to prevent the damage in line with the standard of the order of sewerage law.
	12.2.2 Pretreatment facility shall be modest as well as complying with requirement in order to protect function and structure of sewerage facility. Pretreatment shall not charge excessive obligation on discharger.
Article 12.2	**Permit of Public Sewerage Acceptance**
	12.2.1 Designated industries shall meet the permit of public sewerage acceptance on discharge water quality, which is stipulated in the order, at the entry points to public sewer.
	12.2.2 Omitted
	12.2.3 Municipal sewerage operator can stipulate the permit of public sewerage acceptance on discharge water quality from designated industries in line with the order of sewerage law.
	12.2.4 – 12.2.6 Omitted
Article 12.3-12.12	**Duties of Designated Industries (refer Sewerage Ordinance)**
Article 13	**Inspection of House Sewer, Designated Industries, and Pretreatment System**
	13.1 Municipal sewerage operator can inspect house sewer, designated Industries, and pretreatment system while entering the properties in order to secure the function and structural integrity of sewerage and to keep the effluent of WWTP meet the permit.
	13.2 – 13.3 Omitted
Article 14	**Suspension of Sewer Use**
	14.1 Municipal sewerage operator can temporarily suspend the use of sewerage partially or entirely when necessary for the works on sewerage.
	14.2 Municipal sewerage operator has to notify the affected persons of the timing and area on the suspension of sewerage service.

Article 15	**Sewerage Works by Other Public Authority**
	Municipal sewerage operator can allow other public authorities to implement construction works of sewerage when the sewerage is under the public facilities such as roads, levees and others upon the agreement of the both authorities.
Article 16	The other authorities of Municipal sewerage operator can construct and operate public sewerage based on approval of Municipal sewerage operator.
Article 17	Expenses for construction and management of jointly invested facility shall be determined through coordination of municipal sewerage operator and other operator.
Article 18.1	**Compensation for Damage**
	Municipal sewerage operator can request the person or body who inflicted damage on sewerage for compensation.
Article 18.2	Levy on expenses of designated facility (Omitted)
Article 19	Municipal sewerage operator can charge rehabilitation cost on discharger who discharges excessive wastewater calculated by decree.
Article 20	**Tariff**
	20.1 Municipal sewerage operator can charge tariff on service users by stipulation in local ordinance.
	20.2 Tariff shall be calculated by considering the followings
	20.2.1 Quality and quantity of sewage
	20.2.2 Tariff revenue shall be smaller than the cost of sewerage service.
	20.2.3 Clarity with fixed charge and proportional charge to usage
	20.2.4 Equity to all
	20.3 In case private entity invested a part of public sewerage facility, Municipal sewerage operator shall determine the tariff through considering invested cost.
Article 21.1	**Monitoring of effluent of WWTP**
	21.1.1 Municipal sewerage operator shall monitor effluent quality from WWTPs and keep the records as prescribed in the order of sewerage law.
	21.1.2 Municipal sewerage operator shall operate wastewater treatment plant in complying with requirements of decree as well as local regulation.
Article 21.2	**Management of Sludge**
	21.2.1 Municipal sewerage operator shall treat properly sludge and deposits, which are produced by inspection chamber, wastewater treatment facilities and other facilities, in order to operate sewerage system sustainably as well as to prevent dispersion of hazardous substances in compliance with requirements stipulated in decree.
	21.2.2 Municipal sewerage operator shall task to reduce sewage sludge through dewatering, incineration, reuse and others.
Article 22	**Qualification of Designer, Supervisor, and Operator**
	22.1 Municipal sewerage operator shall task design & supervision of works to those who have qualifications stipulated in the order.
	22.1 Municipal sewerage operator shall task operation and maintenance works to those who have qualifications stipulated in the order.
Article 23	**Sewerage Information Database**
	23.1 Municipal sewerage operator shall create asset information database.

	23.2 The contents of database shall be decided by the ordinance.
	23.3 Municipal sewerage operator shall show the database to persons if requested.
Article 24	**Prohibited Action to Sewerage (Approval of occupation)**
	24.1. Those who conduct the following actions shall obtain the permission of municipal sewerage operators.
	24.1.1 To build structures on the open channels of sewerage.
	24.1.2 To build structures below the open channels of sewerage.
	24.1.3 To build structures on the underground sewers
	24.2- 24.3 Omitted
	24.3 Excepting joint investment and approval of occupation of IT cable and others, municipal sewerage operator is prohibited to approve the occupying sewer.
Article 25.1	**Local Ordinance**
	Municipal sewerage operator shall stipulate the necessary rules for the sewerage service operation other than the prescriptions in the sewerage law and related order.
Article 25.2-25.9	**Prefecture Sewerage (Regional Sewerage)**
Article 26-31.1	**Municipal Drainage Channel (Storm Water Drainage)**
Article 31.2	Cost sharing on prefecture sewerage between municipal and prefecture governments.
Article 32	Right to use of land of others by operators if necessary.
Article 33	Permission with conditions in the law.
Article 34	Subsidy from National Government (Detailed provisions are stipulated by Government Decree.)
Article 35	Loan from National Government.
Article 36	Free use of national land for sewerage.
Article 37	Emergency order from national government to operators.
Article 37.2	Order from operators to designated industries on suspension of sewer use for their continuous discharge over the permit.
Article 38	Cancellation of permission by operators on violation of the law, order, & ordinance.
Article 39	National government's right to obtain report form operators.
Article 39.2	Operators' right to obtain report from designated industries.
Article 40	Transition of power and function to Regional Authority (Omitted)
Article 41	Provisions for National Authority who invests and/or manages sewerage works. (Omitted)
Article 42	Replace of term and phrase of municipality government (Omitted)
Article 43	Dispute handling time limit on decision by operators
Article 44	**Transitional measure (Omitted)**
Article 45-51:	**Penalty**
	Imprisonment or fine is charged on those who inflicted the damage on structure and function of sewerage, who violated the order of operators in 12.5, 37.2, 38.1-2, who violated the quality permit of public sewerage acceptance in 12.2, 12.9, who refused the use of land in article 32, who neglected or falsified the registration in 12.3, who violated the conversion of cesspool in 11.3, who neglected or falsified the mandate in 11.2, 12.3, 12.6, 12.12, 13.1, 39.2, 12.7, 12.8

Appendix-3 Structure of Sewerage Related Laws in Oversea in 10 Countries and Regions

(1) Countries and Regions with Name of Laws

Country/City & Region	Name of Law
Japan	Sewerage Law
Malaysia	Sewerage Service Act 1993 (amended 2006)
	Sewerage Service Industry Act 2006
Singapore	Sewerage and Drainage Act (Revised Edition 2001) Amended Act 5 of 2014
Taiwan	Sewerage Law 2007-01-03
India	The Water (Prevention and Control of Pollution) Act, 1974, India (amended 1978 & 1988)
Bangalore	The Bangalore Water Supply and Sewerage Act, 1964 Amended in 1966 and 1984
Queensland, Australia	Sewerage and Water Supply Act 1949 as amended by all amendments that commenced on or before 13 July 1998
	Standard Sewerage Law, 14 December 2001
Toronto, Canada	Sewers, Toronto Municipal Code Chapter 681 March 20, 2014
EU (Directive)	DIRECTIVE 2000/60/EC establishing a framework for Community action in the field of water policy COUNCIL DIRECTIVE of 21 May 1991 concerning urban waste water treatment DIRECTIVE 2006/7/EC concerning the management of bathing water quality and repealing Directive 76/160/EEC the Waste Framework Directive the Landfill Directive
USA(CWA/NPDES)	Federal Water Pollution Control Act, November 27, 2002 SEC. 519. This Act may be cited as the ‘‘Federal Water Pollution Control Act’’ (commonly referred to as the Clean Water Act).

(2) Articles and Items of Individual Countries and Regions

Japan

Sewerage Law, Japan	
	Title of Chapter & Article
Chapter I	**Objectives**
Article 1	Objective of the Law
Article 2.1	Definition
Chapter II	**Master Plan** **(Comprehensive Basin-wide Planning of Sewerage systems)**
Article 2.2	Master Plan (Comprehensive Basin-wide Planning of Sewerage Systems)
Chapter III	**Public Sewerage System**
Article 3	Operator of Municipal Sewerage
Article 4	Implementation Program
Article 5	Contents of implementation program
Article 6	Requirements of implementation program
Article 7	Structural Requirement
Article 8	Effluent Quality Standard
Article 9	Public Notice of Commencement of Sewerage Service

Article 10	Mandatory Connection
Article 11.1	Mandatory Acceptance of Sewage from Other Property
Article 12.1	Installation of Pretreatment
Article 12.2	Permit of Public Sewerage Acceptance (Discharge standard of wastewater quality)
Article 12.3-12	Duties of Designated Industries
Article 13	Inspection of House Sewer, Designated Industries, and Pretreatment System
Article 14	Suspension of Sewer Use
Article 15	Sewerage Works by Other Public Authority
Article 18.1	Compensation for Damage
Article 19	Share of construction cost (for excessive discharger)
Article 20	Tariff
Article 21.1	Monitoring of effluent of WWTP
Article 22	Qualification of Designer, Supervisor, and Operator
Article 23	Sewerage Information Database
Article 24	Prohibited Action to Sewerage
Article 25.1	Local Ordinance
Chapter II-II	**Basin-wide Sewerage System**
Article 25.2-25.10	Basin-wide sewerage system (Managed by Prefectural Government)
Chapter III	**Municipal Drainage Channel**
Article 26-31.1	Municipal Drainage Channel
Chapter IV	**Miscellaneous**
Article 31.2 - 44	Miscellaneous
Chapter V	**Penalty**
Article 45-51	Penalty

Malaysia(1)

	Sewerage Service Act 1993, Malaysia （amended 2006）
	An Act to amend and consolidate the laws relating to sewerage systems and sewerage services throughout Malaysia for the purpose of improving sanitation and the environment and promoting public health; and to provide for matters connected therewith and incidental thereto.
Part 1	**Preliminary**
1	Short title, application and commencement
2	Interpretation
Part 2	**Responsibility for Sewerage Systems and Sewerage Services**
3	Federal Government to have authority for sewerage systems and services
4	Transfer of property for sewerage purposes
5	Existing agreements
6	Assumption of control and management of contractual undertakings
7	Privatization agreement
Part 3	**Director General of Sewerage Services**
8	Director General, Deputy Director General, *etc.*
9	Powers and functions of the Director General
10	Power of the Minister to give directions

Part 4	**Public Sewerage Systems**
11	Sewerage system deemed to be public sewerage system
12	Declaration of public sewerage system
13	Public sewerage system may be constructed
14	Requirement in respect of sewer or sewerage system which will form part of public sewerage system
15	Management, operation, maintenance, *etc.*, of public sewerage system
16	Clearing, cleansing and emptying public sewerage system
17	Requirement that proper drainage for sewage be made
18	Unauthorized connection to public sewer, *etc.*
19	Industrial effluent or noxious matter not to communicate with public sewer, *etc.*
20	Damage to public sewerage system to be made good
Part 5	**Private Sewerage Systems and Septic Tanks**
21	Power of Director General to apply any system of sewerage services
22	Power to cause private septic tanks to be cleansed, *etc.*
23	Power of Director General to require private sewerage system to be put in proper order
24	Power to require premises to be connected to public sewerage system
25	Duty of owner to operate and maintain private sewerage system or septic tank
26	Penalty in respect of nuisance, *etc.*, caused by private sewerage system construction
Part 6	**Power of Entry**
27	Power to enter premises
28	Power to enter adjoining land
29	Compensation
Part 7	**Charges**
30	Power to impose charges
Part 8	**Approval of Plans and Specifications of Sewerage System or Septic tank**
31	Approval required for construction of sewerage system or septic tank
Part 9	**Licensing**
32	Licences required for certain acts “maintain, operate, sewerage service, connection, construction”
33	Application for and issuance of licence
34	Additional duty of licensee
Part 10	**Miscellaneous**
35	Penalty for obstructing Director General, *etc.*
36	Penalty for not complying with notice
37	Proceedings if occupier opposes the execution of works
38	Offences by body corporate
39	Conduct of prosecution
40	Power to compound offences
41	Service of documents
42	Inaccuracies in documents
43	Certificate establishing proprietor of land
44	Liability of transferor

45	Power to make regulations
46	Savings and transitional

Malaysia(2)

	Sewerage Service Industry Act 2006, Malaysia
	An Act to provide for and regulate water supply services and sewerage services and for matters incidental thereto.
Part 1	**Preliminary**
1	Short title, application and commencement
2	Interpretation
3	Federal Government to have executive authority
Part 2	**Licensing Provisions**
Chapter 1	**Individual license**
4	Requirement for individual licence
5	Power to exempt from requirement for individual licence
6	Application for individual licence
7	Further information or document
8	Recommendation by the Commission
9	Grant or refusal of individual licence
10	Compliance with individual licence conditions
11	Power to impose additional, vary or revoke conditions
12	Transfer of individual licence
13	Revocation of individual licence
14	Effective date of revocation of individual licence
15	Publication of revocation of individual licence
16	Surrender of individual licence
17	Renewal of individual licence
18	Effect of revocation, surrender or non-renewal of individual licence
19	Register of individual licence
Chapter 2	**Class License**
20	Requirement of class licence
21	Restrictions imposed on class license
22	Power to exempt from requirement for class licence
23	Exemption from duties or obligations
24	Approval for class licence
25	Application for class licence and registration
26	Compliance with conditions of class licence
27	De-registration of class licensee
28	Register of class licence
Part 3	**Duties and Obligations of Licensees**
Chapter 1	**Duties and obligations applicable to all licensees**
29	Furnishing of information

30	Submission of business plan
31	Direction by Commission to facilities license to construct, operate and maintain new public water supply system or public sewerage system
32	Access to public water supply system and public sewerage system
33	Dealing with consumers
34	Security, integrity and safety of water supply system and sewerage system
35	Duty of facilities licensee in respect of water supply system and sewerage system
Chapter 2	**Duty and obligations applicable to licensees providing water supply services**
36	Developing and maintaining water supply system
37	Supply of water
38	Connecting public mains and premises to be supplied with water
39	Supply of water through public pipes
40	Maintaining water pressure
41	Water quality
42	Supply of water for fire-fighting
Chapter 3	**Duty and obligations applicable to licensees providing sewerage services**
43	Operating and maintaining public sewerage system
44	Septic tank to be desludged
Part IV	**Provisions Relating to Water Supply System, Water Supply Services, Sewerage System and Sewerage Services**
Chapter 1	**Water supply system and sewerage system**
45	Construction of water supply system, sewerage system and septic tanks
46	Requirement for developer to construct water supply system and sewerage system
47	Developer to hand over water supply system or sewerage system of new development to service licenses
48	Damage to public water supply system and sewerage system to be made good
49	Qualifications to operate, etc., water supply system and sewerage system
50	Permits for contractors
51	Plumbing and connection works
Chapter 2	**Water supply services**
52	Supply agreement with consumers
53	Bulk supply between service licenses providing water supply services
54	Reduction or cessation of supply
55	Restriction of water supply
56	Special power during emergency
Chapter 3	**Sewerage system and services**
57	Power to require premises to be connected to public sewerage system
58	Power to require to connect development to public sewerage system
59	Requirement that proper drainage for sewage be made
60	Unauthorized connection to public sewer, etc.
61	Prohibited effluent or noxious matter not to be discharged into public sewer, etc.
62	Responsibilities for communal septic tank

63	Power to install or construct private sewerage system or septic tank
64	Power to require private sewerage system, etc., to be put in proper order
65	Duty to operate and maintain private sewerage system, etc.
66	Penalty in respect of nuisance, etc., caused by private sewerage system or septic tanks
67	Contract for the provision of sewerage services
Part V	**Consumer Protection, Requirement of Disputes and Inquiries**
Chapter 1	**Consumer protection**
68	Consumer standards
69	Water Forum
70	Functions of the Water Forum
Chapter 2	**Resolutions of disputes**
71	Disputes
72	Dispute procedure
73	Committee to decide on notified disputes
74	Decisions to be in writing
75	Registration of decisions
76	Enforcement of decision
Chapter 3	**Inquiries**
77	Inquiries by the Commission
78	Conduct of inquiry
79	Publication of notice of inquiry
80	Private inquiry and confidential materials
81	Reports of public inquiry
82	Protection from civil action
83	Register of reports
Part VI	**Rates, Charges and Deposits**
84	Regulations regarding rates, charges and deposits
85	Power to exempt from rates, charges and deposits
86	Prescribed rates and charges may be collected and retained by licensee
87	Power to request deposit
88	Recovery of money due
89	Disconnection of water supply
90	Rights of water distribution licensee who is licensed to provide sewerage services
Part VII	**Appeal Tribunal**
91	Establishment of Appeal Tribunal
92	Constitution of Appeal Tribunal
93	Allowances
94	Resignation and revocation of appointment
95	Vacation of office and new or temporary appointments
96	Disclosure of interest
97	Secretary to Appeal Tribunal and other officers
98	Appeal to Appeal Tribunal

99	Record of decision or direction of Commission or committee
100	Stay of decision or direction pending appeal
101	Commission of Appeal Tribunal
102	Sittings of Appeal Tribunal
103	Procedures of Appeal Tribunal
104	Powers of Appeal Tribunal
105	Decisions of Appeal Tribunal
106	Enforcement of decision of Appeal Tribunal
107	Immunity of action for act or omission done in good faith
Part VIII	**Transfer of Business**
108	Interpretation
109	Sanction required for reconstruction, etc., of licensees
110	Application to High Court to facilitate agreement or arrangement for transfer of whole or part of business of licensee being given effect to
Part IX	**Assumption of Control**
111	Interpretation
112	Licensee to inform Commission
113	Action of Commission in respect of licensee in certain circumstances
114	Action of Minister in respect of licensee in national interest
115	Provision in relation to appointment under section 113
116	Provision in relation to removal from office under section 113
117	Provision in relation to assumption of control under section113 or 114
118	Effect of obstructing or hindering Commission or appointed person
119	Moratrium
120	Order to be final
Part X	**General Offences and Penalties**
121	Offences of contamination of water
122	Wrongful acts
123	Unlawful connection of water supply
124	Tampering with meter or sub-meter
125	Tampering of water supply system or sewerage system or part of the systems
126	Taking of water from fire hydrant
127	Penalty for obstructing
128	Proceedings if occupier opposes the execution of works
129	Unlawful use or supply of non-standard equipment, device, material, system or facilities
130	Office for giving false or misleading information
131	Power to taken action
Part XI	**Information-gathering Powers and Enforcement Provisions**
132	Provision of information
133	Proof of compliance
134	Commission may retain documents
135	Access to records

136	Incorrect records
137	Record of information
138	Publication of information
139	Offence for non-compliance
Chapter 2	**Powers of Entry**
140	Power to enter on and examine land
141	Power to enter on land for purposes of construction
142	Appeal for order of Land Administrator
143	Installation of pipe, etc., on State Land
144	Maintenance, repair and upgrading of installation
145	Saving of way leave agreement
146	Compensation
Chapter 3	**Enforcement**
147	Authorized officer
148	Power of investigation
149	Entry into premises with search warrant
150	Power of entry and search and seizure without warrant
151	Access to computerized data
152	Warrant admissible notwithstanding defects
153	List of things seized
154	Release of things seized
155	Power to require attendance of person acquainted with case
156	Examination of person acquainted with case
157	Admissibility of statements in evidence
158	Authorized officer to complete investigation and hand over to police
159	Cost of holding equipment, etc., seized
160	No cost or damages arising from seizure to be recoverable
161	Obstruction
162	Additional powers
Chapter 4	**Miscellaneous**
163	Compounding of offences
164	Prosecution
165	Offences by body corporate
166	Information or informer not to be disclosed
167	Manner of service of documents
168	Inaccuracies in documents
169	Liability of transferors
170	Exemption of equipment from distress and attachment
Part XII	**General**
171	Water Industry Fund
172	Sewerage Capital Contribution Fund
173	Registration of agreements

Singapore

	Sewerage and Drainage Act, Singapore (Revised Edition 2001) Amended Act 5 of 2014
	An Act to provide for and regulate the construction, maintenance, improvement, operation and use of sewerage and land drainage systems, to regulate the discharge of sewage and trade effluent and for matters connected therewith.
Part 1	**Preliminary**
1	Short title
2	Interpretation
Part 2	**Administration**
3	Administration of Act
Part 3	**Sewerage**
4	Construction and maintenance of public sewerage systems
5	Sewers may be emptied into sea
6	Premises not provided with adequate sewerage system
7	Board may take over control, etc., of private sewerage system
8	Vesting of sewerage systems in Government
9	Vesting of private sewers in Government
10	Sewerage systems to be kept in proper order at cost of owners
11	Sewerage systems, etc., not to be constructed or altered without Board's certificate or approval
12	Buildings without adequate sanitary facilities
13	Power to inspect sewerage systems and sanitary facilities
13A	Duty to enquire before excavation
14	Works likely to affect sewer or sewerage system not to be carried out without Board's certificate or approval
15	Sanitary facilities, sewerage system and sewage and trade effluent removal for farms
16	Trade effluent not to be discharged into public sewerage system without Board's approval
16A	Prohibition on discharge of dangerous or hazardous substance or trade effluent containing dangerous or hazardous substance
17	Order to stop discharge of dangerous or hazardous substance or trade effluent containing dangerous or hazardous substance
18	Discharge of sewage, etc.
19	Restrictions on use of public sewerage system
20	Damage caused to public sewer, etc.
Part 4	**Drainage**
21	Board may construct storm water drainage systems
22	Vesting of private drains in Government
23	Storm water drainage system not to be constructed or altered without Board's certificate or approval
24	Drains and drainage reserves not to be interfered with
25	Premises without proper drainage
26	Works affecting storm water drainage system

27	Construction and maintenance of private drains
28	Areas not provided with effectual drainage
29	Vesting of drainage reserves in Government
30	Damage caused to storm water drainage system, etc.
Part 5	**Protection of Water Resources**
31	Prohibition on extraction of water
Part 6	**Registration, Codes of Practice and Certificates or Approval for Works**
32	Codes of practice and specifications
33	Certificates or approval required for works
34	Supervision of works by qualified person
35	Duties of qualified person
36	Deleted
37	Deleted
Part 7	**Enforcement**
38	Power to demand names and addresses
39	Powers of Board to examine and secure attendance
40	Powers of arrest
41	Default in compliance with notice
42	Appeal against notice
43	Board may act in cases of emergency
44	Power of entry
44A	Power to enter and investigate
45	Power to enter on land adjacent to works
46	Penalty for obstructing Board in its duty
46A	Making of false statements, etc.
47	Appeal to Minister against notices, orders, directions, etc.
Part 8	**Compensation, Damages, Fees, Costs and Expenses**
48	Compensation, damages, fees, costs and expenses to be determined by Magistrate's Court or District Court
49	Occupier may execute work where owner defaults in execution of work
50	Recovery of costs and expenses payable by owners
51	Recovery of costs and expenses by installments
52	Proceedings for recovery of arrears
53	Attachment
54	Application of proceeds of sale
55	Title acquired by purchaser at sale by Board
56	Costs of proceedings for recovery of arrears
57	Power to stop sale
58	Application to court
59	Liability of transferor who has not given notice
60	Proceedings where occupier opposes execution of work
Part 9	**Miscellaneous Provisions**

61	Notices, orders and other documents may be given by authorised officer
62	Service of notices, etc.
63	General penalties
64	Furnishing of deposits (relevant to Article 33)
65	Inaccuracies in document
66	Evidence of analyst
67	Offence by body corporate
67A	Liability for offence committed by agent or employee
68	Jurisdiction of court
69	Saving of prosecutions under other written laws
70	Composition of offences
71	Protection from liability
72	Repealed by Act 10 of 2012
73	Exemption
74	Regulations

Taiwan

Article	**Taiwan, Sewerage Law 2007-01-03**
Chapter I	**General Provision**
Article 1	Purpose of sewerage facilitation This Law is stipulated for the purpose of facilitating the construction and management of the sewage in the planned urban and designated areas to protect the quality of water; with regard to matters not provided in this Law, other rules and regulations shall apply.
Article 2	Definition of term
Article 3	Competent authority
Article 4	Central competent authorities
Article5	Municipality competent authority
Article 6	County competent authority
Article 7	Public Sewer
Article 8	Special Purpose Sewers
Article 9	Appoint or set up a Sewer institution
Chapter II	**Engineering and Construction**
Article 10	Standard for constructing the Sewer
Article 11	Setting up regional sewerage plan, reporting such plan and including into urban plan or regional plan
Article12	Sewer construction in cooperation with other public facilities
Article 13	Consultation and negotiation with relevant competent
Article 14	Occupation of public or private land
Article 15	Decision on relocating underground facilities
Article 16	Temporary use of public or private land
Article 17	Registered technician of planning, designing and construction supervision
Article 18	Technique examination of operation and maintenance
Chapter III	**Use and Management**
Article 19	Public announce of drainage area
Article 20	Responsibility of private drainage facility
Article 21	Technique examination and training of drainage facility installation
Article 22	Regulations for management of private drainage facility installation contractor
Article 23	Obligation of direct connection to public sewer

Article 24	Examination/inspection of private drainage facility, and wastewater flow and quality
Article 25	Standard water quality of the Sewage
Chapter IV	**Fee for Use**
Article 26	Calculation and collection of Sewer user fee
Article 27	Penalty on delayed user fee payment
Chapter V	**Supervision and Assistance**
Article 28	Correction of effluent water quality in case of exceeding drainage standard
Article 29	Order on correcting private drainage facility, and penalty and file on user in case to fail to pay
Article 30	Examination and reporting/recording of operation of private drainage facility
Chapter VI	**Penalty**
Article 31	Amount of fine on violation of Sewerage Law
Article 32	Right of competent authority on fine and requirement for grant by court
Chapter VII	**Miscellaneous**
Article 33	Enforcement rule of Sewerage Law
Article 34	Date of promulgation

India and Bangalore

Water Supply and Sewerage Act 1964, Bangalore India

Source: International Environmental Law Research Centre

Background on Indian Legal Framework for Sanitation in Urban Area

There is no comprehensive urban sanitation law in India, either at the Central or State levels. Instead, the sources of law relating to urban sanitation exist in a multitude of legal instruments, including pollution control laws enacted by the Central Government and municipal laws, laws governing parastatal bodies, and building and sanitation byelaws, enacted at the State or local level. In addition, the National Urban Sanitation Policy 2010 and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) provide the basis for government and private sector interventions for urban sanitation.

Municipal and Parastatal laws

All the municipal laws include provisions relating to water supply, drainage, sewerage and sanitation. Sanitation is one of the duties/functions of the municipal authorities. **They are also required to ensure connection of private drains to the drainage network and to provide places for disposal of sewage.** Similar obligations are cast on parastatal bodies under the applicable laws. While these laws do not address all aspects of urban sanitation, even the existing provision are not often implemented. Non-availability of funds, prioritization of other public services, lack of awareness about the importance of sanitation, absence of public demand, etc. are some of the reasons for this state of affairs.

Section	The Water (Prevention and Control of Pollution) Act, 1974, India (amended 1978 & 1988)
Chapter I	**Preliminary**
1	Short Title, Application and Commencement
2	Definitions
Chapter II	**The Central and State Boards for Prevention and Control of Water Pollution**
3	Constitution of Central Board
4	Constitution of State Boards
5	Terms and Conditions of Service of Members
6	Disqualifications
7	Vacation of Seat by Members
8	Meetings of Boards

9	Constitutions of Committees
10	Temporary Association of Persons with Board for Particular Purposes
11	Vacancy in Board not to Invalidate Acts or Proceedings
12	Member-Secretary and Officers and Other Employees of Boards
Chapter III	**Joint Boards**
13	Constitution of Joint Board
14	Composition of Joint Boards
15	Special Provision Relating to Giving of Directions
Chapter IV	**Powers and Functions of Boards**
16	Functions of Central Board
17	Functions of State Board
18	Power to Give Directions
Chapter V	**Prevention and Control of Water Pollution**
19	Power of State Government to Restrict the Application of the Act to Certain Areas
20	Power to Obtain Information
21	Power to Take Samples of Effluents and Procedure to Be Followed in Connection Therewith
22	Reports of the Results of Analysis on Samples Taken under Section 21
23	Power to Entry and Inspection
24	Prohibition on Use of Stream or Well for Disposal of Polluting Matter, etc.
25	Restrictions on New Outlets and New Discharges
26	Provision Regarding Existing Discharge of Sewage or Trade Effluent
27	Refusal or Withdrawal of Consent by State Board
28	Appeals
29	Revision
30	Power to State Board to Carry out Certain Works
31	Furnishing of Information to State Board and Other Agencies in Certain Cases
32	Emergency Measures in Case of Pollution of Stream or Well
33	Power of Board to Make Application to Courts for Restraining Apprehended Pollution of Water in Stream and Wells
33A	Power to Give Directions
Chapter VI	**Funds, Accounts and Audit**
34	Contributions by Central Government
35	Contributions by State Government
36	Fund of Central Board
37	Fund of State Board
37A	Borrowing Powers of Board
38	Budget
39	Annual Report
40	Account and Audit
Chapter VII	**Penalties and Procedure**
41	Failure to Comply with Directions under Sub-section (2) or Sub-section (3) of Section 20, or Orders Issued under Clause ‘c’ of Sub-section (1) of 32 or Directions Issued under Sub-section

	(2) of Section 33 or Section 33A
42	Penalty for Certain Acts
43	Penalty for Contravention of Provisions of Section 24
44	Penalty for Contravention of Section 25 or Section 26
45	Enhanced Penalty after Previous Conviction
45A	Penalty for Contravention of Certain Provisions of the Act
46	Publication of Names of Offenders
47	Offences by Companies
48	Offences by Government Departments
49	Cognizance of Offences
50	Members, Officers and Servants of Board to be Public Servants
Chapter VIII	**Miscellaneous**
51	Central Water Laboratory
52	State Water laboratory
53	Analysts
54	Report of Analysts
55	Local Authorities to Assist
56	Compulsory Acquisition of Land for the State Board
57	Returns and Reports
58	Bar of Jurisdiction
59	Protection of Action Taken in Good Faith
60	Overriding Effect
61	Power of Central Government to Supersede the Central Board and Joint Boards
62	Power of State Government to Supersede the State Board
63	Power of Central Government to Make Rules
64	Power of State Government to Make Rules
	THE BANGALORE WATER SUPPLY AND SEWERAGE ACT, 1964 **Amended in 1966 and 1984**
CHAPTER I	**PRELIMINARY**
1	Short title and commencement.
2	Definitions.
CHAPTER II	**ESTABLISHMENT OF THE BOARD**
3	Constitution and composition of the Bangalore Water Supply and Sewerage Board.
4	Term of office and conditions for re-appointment of members of Board.
5	Disqualification for becoming a member of the Board.
6	Removal or suspension of members.
7	Power of State Government to declare certain transactions void.
8	Temporary absence of members.
9	Incorporation of Board.
10	Authentication of orders and other instruments of the Board.
11	Meetings of the Board.

12	Appointment of staff.
13	Appointment of consultants.
14	Consultative Committee.
15	General duties of the Board.
CHAPTER III	**THE BOARD'S FINANCE, ACCOUNTS AND AUDIT**
16	General principals for Board's finance.
17	Annual financial statement.
18	Restriction on unbudgeted expenditure.
19	Subventions to the Board.
20	Loans to the Board.
21	Power of Board to borrow.
22	Guarantee of loans.
23	Omitted.
24	Depreciation reserve.
24A	Improvement reserve.
24B	Payment of interest to Government.
25	Accounts and audit.
CHAPTER IV	**WATER SUPPLY**
26	Vesting of works in Board.
27	Construction of water works.
28	Trespass on water supply premises.
29	Prohibition of building over water mains.
30	Control over house connections.
31	Payment to be made for water supplied.
32	Private water supply for domestic consumption.
33	Supply of water for domestic purpose not to include any supply for certain specified purposes.
34	Water supply for domestic purposes not to be used for non-domestic purposes.
35	Power to supply water for non-domestic purposes.
36	Supply of water to the Corporation and other local authorities.
37	Use of water for extinguishing fire.
38	Public water supply.
39	Power to lay mains.
40	Power to lay service pipes, etc.
41	Provision of fire hydrants.
42	Power to require owners of premises to set up pumps, etc.
43	Supply of water.
44	Laying of supply pipes, etc.
45	Power to require separate service pipes.
46	Stopcocks.
47	Power to provide meters.
48	Presumption as to correctness of meters.
49	Prohibition of waste or misuse of water

50	Power to enter premises to detect waste or misuse of water.
51	Power to test water fittings.
52	Water pipes, etc., not to be placed where water will be polluted.
53	Power to cut off water supply.
54	Joint and several liability of owners and occupiers for offence in relation to water supply.
55	Non-liability of Board when supply reduced or not made in certain cases.
56	Rights of user of conduits, lines, etc.
57	Power of owner of premises to place pipes through land belonging to other persons.
58	Power to execute work after giving notice to the person liable.
59	Work to be done by licensed plumber.
60	Prohibition of certain acts.
61	Regulations regarding water supply.
61A	Bye-laws regarding water supply.
62	Punishment for certain offences.
CHAPTER V	**SEWERS AND SEWERAGE**
63	Vesting of sewers, etc., in Board.
64	Control of sewers and sewage disposal works.
65	Certain matters not to be passed into Board sewers.
66	Application by owners and occupiers to drain into Board sewers.
67	Drainage of undrained premises.
68	New premises not to be erected without drains.
69	Power to drain group or block premises by combined operations.
70	Power of Board to close or limit the use of private drains in certain cases.
71	Use of drain by a person other than the owners.
71	Sewage and rain water drains to be distinct.
73	Power to require owner to carry out certain works for satisfactory drainage.
74	Appointment of places for the emptying of sewers and disposal of sewage.
75	Connection with sewers not to be made without permission.
76	Buildings and private streets not to be erected or constructed over sewers without permission.
77	Rights of user of property for sewers.
78	Power of owner of premises to lay sewer through land belonging to other persons.
79	Power to execute work after giving notice to the person liable.
80	Power to affix shafts, etc., for ventilation of sewer or cesspool.
81	Power to examine and test sewers, etc., believed to be defective.
82	Work to be done by licensed plumber.
83	Prohibition of certain acts.
84	Regulations regarding sewerage.
84A	Bye-laws regarding sewerage.
85	Punishment for certain offences.
CHAPTER VI	**MISCELLANEOUS**
86	Annual reports, statistics and returns.
87	Power to make rules.

88	Regulations.
89	Directions by the State Government.
90	Licenses and written permissions.
91	Powers of entry and inspection.
92	Power to enter land adjoining land in relation to any work.
93	Breaking into buildings
94	Time of making entry.
95	Consent ordinarily to be obtained.
96	Regard to be had to social or religious usages.
97	Prohibition or obstruction or molestation in execution of work.
98	Notices, etc., to fix reasonable time.
99	Signature on notices, etc., may be stamped.
100	Notices, etc., by whom to be served or issued.
101	Service of notices, etc.
102	Service of bills for charges or notice of demand by ordinary posts.
103	Power in case of non-compliance with notice, etc.
104	Liability of occupier to pay in default of owner.
105	Execution of work by occupier in default of owner and deduction of expenses from rent.
106	Relief to agent and trustees.
107	Compensation to be paid by offenders for damage caused by them.
108	Mode of recovery of dues.
109	General penalty.
110	Offences by companies.
111	Prosecutions
112	Composition of offences.
113	Arrest of offenders.
114	Duties of police officers and employees of the Corporation.
115	Validity of notices and other documents.
116	Admissibility of document or entry as evidence.
117	Evidence of officers of Board.
118	Delegation of powers.
119	Chief Controlling Authority.
120	Appeals
121	Revision.
122	Rules and regulations to be laid before State Legislature, etc.
123	Provisions as to employees of the Corporation employed in connection with water supply or sewerage undertakings.
124	Members, officers and servants of the Board to be public servants.
125	Protection of action of the Board, etc.
126	Notice to be given of suits.
127	Continuation of appointments, notifications
128	Amendment of Mysore Act LXIX of 1949.

129	Orders for bringing this Act into force.
	SCHEDULE. Summary of Amendments

Queensland, Australia

Article	Australia, Queensland Sewerage and Water Supply Act 1949 as amended by all amendments that commenced on or before 13 July 1998
PART 1	**PRELIMINARY**
1	Short title
2-3	deleted
4	Definitions
PART 2	**STANDARD SEWERAGE LAW AND STANDARD WATER SUPPLY LAW**
5	Standard Sewerage Law
6	Standard Water Supply Law
PART 3	**CONSTITUTION OF THE PLUMBERS AND DRAINERS EXAMINATION AND LICENSING BOARD**
7	Constitution of the board
7AA	Members
7AB	Vacancies
7AC	Chairperson
7AD	Meetings
7AE	Secretary
7A	Entitlements of board members
8	Functions of the board
9	Classes of licences
10	deleted
11	Licences
12	Application for licence
12A	Duration of licence
13	deleted
14	Interim licence
14A	Limitation on interim licence holders
15	Scope of licences
15A	Restricted plumber's or drainer's licence
16	Offences by persons not holding appropriate licences etc
17	Cancellation and suspension of licences etc.
PART 3A	**PROHIBITED SUBSTANCES AND TRADE WASTE**
17A	Prohibition on discharge of prohibited substances and trade waste
PART 3B	**LEGAL PROCEEDINGS**
17B	Indictable and summary offences
17C	Proceedings for indictable offences
17D	Limitation on who may summarily hear indictable offence proceedings
17E	Limitation on time for starting summary proceedings
PART 4	**GENERAL**
18A	Obtaining licence or interim licence by misrepresentation etc.
18B	Approval of forms
19	Regulation making power
20-21	deleted
22	Reference to Standard Sewerage By-laws 1981 etc
23	Reference to Standard Water Supply By-laws 1949 etc.

24	Sewerage, Water Supply, and Gasfitting Act 1949 references
25	deleted
26	Numbering and renumbering of Act
Article	**Australia, Queensland** **Standard Sewerage Law, 14 December 2001**
Chapter 1	**Preliminary**
Part 1	**Introduction**
1	Short title
2	Commencement
3	Purposes of law The purposes of this law are (a) to make provision, under section 51 of the Act, for sewerage, sanitary conveniences and stormwater drainage; and (b) to prescribe matters under section 17A2 of the Act.
4	Dictionary
5	References
6	Meaning of "applied provisions" and "glossary"
7	Interpretation of applied provisions
8	Work not regulated by this law
PART 2	**APPOINTMENTS**
9	Engineers
10	Inspectors.
11	Trade waste officers
PART 3	**PROVISIONS AIDING ENFORCEMENT**
12	Local government may direct owner to perform work
CHAPTER 2	**SEWERAGE SYSTEMS AND STORMWATER DRAINAGE**
PART 1	**ADMINISTRATION**
13	Map of sewered area to be kept
14	Access to sewerage system
15	Premises to connect to sewerage system
16	Notice to connect to sewerage system or install on-site sewerage facility "may require to connect the premises to a sewerage system"
PART 2	**GENERAL PROVISIONS ABOUT SEWERAGE SYSTEMS**
17	Interference with sewerage systems
18	Costs of repairing local government's sewerage system
19	Building over sewerage system
PART 3	**USE OF SEWERAGE SYSTEMS**
20	Wastes to discharge to sewerage system
21	Swimming pools
PART 4	**PROVISIONS FOR PART 3A OF ACT**
Division 1	***Discharges into sewerage or stormwater drainage***
22	Definition for div 1
23	Prohibited substances
24	Trade waste approvals

95	Appeals to court
96	Starting appeals
97	Time for making appeals
98	Stay of operation of decision
99	Powers of court on appeal
100	Effect of decision of court on appeal
101	Appeal to District Court on question of law only
PART 2	**OTHER MATTERS**
102	Interaction with IPA
PART 3	**TRANSITIONAL**
103	Definitions for pt 3
104	Maintenance of existing combined sanitary drains
105	Interim on-site sewerage code
106	Existing product authorisations by the Joint Committee
107	Existing approvals by local government
108	Existing approvals
109	Work planned, approved or lawfully started before commencement
110	Changes to existing work
111	Certain unsafe existing work to be changed to comply with this law
112	Carrying out of work approved under this part
PART 4	**REPEAL**
113	Repeal

Canada, Toronto

Article	**Sewers, Toronto Municipal Code Chapter 681** March 20, 2014
Article I	**Sewage and Land Drainage**
§ 681-1	Definitions
§ 681-1.1	Administration
§ 681-2	Sanitary and combined sewer requirements
§ 681-3	Prohibition of dilution
§ 681-4	Storm sewer requirements
§ 681-5	Pollution prevention planning
§ 681-6	Agreements
§ 681-7	Compliance program
§ 681-8	Sampling and analytical requirements
§ 681-9	Spills
§ 681-10	General
§ 681-11.	Sewer connections
§ 681-12	Confidential information
§ 681-12.1	Contact information
§ 681-12.2	Access
§ 681-13	Self-monitoring and sampling
§ 681-13.1	Powers and authority of the General Manager or Inspector
§ 681-13.2	General prohibitions and liability for damage

§ 681-14	Offence

EU Directives: omitted

USA

Section	FEDERAL WATER POLLUTION CONTROL ACT , USA November 27, 2002 SEC. 519. This Act may be cited as the ‘‘Federal Water Pollution Control Act’’ (commonly referred to as the Clean Water Act).
TITLE I	**RESEARCH AND RELATED PROGRAMS**
Sec. 101	DECLARATION OF GOALS AND POLICY
Sec.102	COMPREHENSIVE PROGRAMS FOR WATER POLLUTION CONTROL
Sec. 103	INTERSTATE COOPERATION AND UNIFORM LAWS
Sec. 104	RESEARCH, INVESTIGATIONS, TRAINING, AND INFORMATION
Sec.105	GRANTS FOR RESEARCH AND DEVELOPMENT
Sec. 106	GRANTS FOR POLLUTION CONTROL PROGRAMS
Sec.107	MINE WATER POLLUTION CONTROL DEMONSTRATIONS
Sec. 108	POLLUTION CONTROL IN GREAT LAKES
Sec. 109	TRAINING GRANTS AND CONTRACTS
Sec.110	APPLICATION FOR TRAINING GRANT OR CONTRACT; ALLOCATION OF GRANTS OR CONTRACTS
Sec. 111	AWARD OF SCHOLARSHIPS
Sec.112	DEFINITIONS AND AUTHORIZATIONS
Sec. 113	ALASKA VILLAGE DEMONSTRATION PROJECTS
Sec. 114	LAKE TAHOE STUDY
Sec.115	IN-PLACE TOXIC POLLUTANTS
Sec. 116	HUDSON RIVER PCB RECLAMATION DEMONSTRATION PROJECT
Sec. 117	CHESAPEAKE BAY
Sec.118	GREAT LAKES
Sec. 119	LONG ISLAND SOUND
Sec.120	LAKE CHAMPLAIN BASIN PROGRAM
Sec. 121	LAKE PONTCHARTRAIN BASIN
Sec. 121	WET WEATHER WATERSHED PILOT PROJECTS
TITLE II	**GRANTS FOR CONSTRUCTION OF TREATMENT WORKS**
Sec.201	PURPOSE
Sec. 202	FEDERAL SHARE
Sec.203	PLANS, SPECIFICATIONS, ESTIMATES, AND PAYMENTS
Sec. 204	LIMITATIONS AND CONDITIONS
Sec. 205	ALLOTMENT
Sec.206	REIMBURSEMENT AND ADVANCED CONSTRUCTION
Sec. 207	AUTHORIZATION
Sec.208	AREAWIDE WASTE TREATMENT MANAGEMENT
Sec. 209	BASIN PLANNING

Sec.210	ANNUAL SURVEY
Sec. 211	SEWAGE COLLECTION SYSTEMS
Sec. 212	DEFINITIONS
Sec. 213	LOAN GUARANTEES FOR CONSTRUCTION OF TREATMENT WORKS
Sec.214	PUBLIC INFORMATION
Sec. 215	REQUIREMENTS FOR AMERICAN MATERIALS
Sec. 216	DETERMINATION OF PRIORITY
Sec. 217	COST-EFFECTIVENESS GUIDELINES
Sec. 218	COST EFFECTIVENESS
Sec.219	STATE CERTIFICATION OF PROJECTS
Sec. 220	PILOT PROGRAM FOR ALTERNATIVE WATER SOURCE PROJECTS
Sec. 221	SEWER OVERFLOW CONTROL GRANTS.
TITLE III	**STANDARDS AND ENFORCEMENT**
Sec. 301	EFFLUENT LIMITATIONS
Sec.302	WATER QUALITY RELATED EFFLUENT LIMITATIONS
Sec. 303	WATER QUALITY STANDARDS AND IMPLEMENTATION PLANS
Sec. 304	INFORMATION AND GUIDELINES
Sec. 305	WATER QUALITY INVENTORY
Sec. 306	NATIONAL STANDARDS OF PERFORMANCE
Sec. 307	TOXIC AND PRETREATMENT EFFLUENT STANDARDS
Sec. 308	INSPECTIONS, MONITORING, AND ENTRY
Sec. 309	FEDERAL ENFORCEMENT
Sec.310	INTERNATIONAL POLLUTION ABATEMENT
Sec. 311	OIL AND HAZARDOUS SUBSTANCE LIABILITY
Sec. 312	MARINE SANITATION DEVICES
Sec. 313	FEDERAL FACILITIES POLLUTION CONTROL
Sec. 314	CLEAN LAKES
Sec. 315	NATIONAL STUDY COMMISSION
Sec. 316	THERMAL DISCHARGES
Sec. 317	FINANCING STUDY
Sec. 318	AQUACULTURE
Sec. 319	NONPOINT SOURCE MANAGEMENT PROGRAMS.
Sec. 320	NATIONAL ESTUARY PROGRAM
TITLE IV	**PERMITS AND LICENSES**
Sec. 401	CERTIFICATION
Sec. 402	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
Sec. 403	OCEAN DISCHARGE CRITERIA
Sec. 405	PERMITS FOR DREDGED OR FILL MATERIAL
Sec. 406	COASTAL RECREATION WATER QUALITY MONITORING AND NOTIFICATION.
TITLE V	**GENERAL PROVISIONS**
Sec. 501	ADMINISTRATION
Sec. 502	GENERAL DEFINITIONS

Sec. 503	WATER POLLUTION CONTROL ADVISORY BOARD
Sec. 504	EMERGENCY POWERS
Sec. 505	CITIZEN SUITS
Sec. 506	APPEARANCE
Sec. 507	EMPLOYEE PROTECTION
Sec. 508	FEDERAL PROCUREMENT
Sec. 509	ADMINISTRATIVE PROCEDURE AND JUDICIAL REVIEW
Sec. 510	STATE AUTHORITY
Sec. 511	OTHER AFFECTED AUTHORITY
Sec. 512	SEPARABILITY
Sec. 513	LABOR STANDARDS
Sec. 514	PUBLIC HEALTH AGENCY COORDINATION
Sec. 515	EFFLUENT STANDARDS AND WATER QUALITY INFORMATION ADVISORY COMMITTEE
Sec. 516	REPORTS TO CONGRESS
Sec. 517	GENERAL AUTHORIZATION
Sec. 518	INDIAN TRIBES
Sec. 519	SHORT TITLE
TITLE VI	**STATE WATER POLLUTION CONTROL REVOLVING FUNDS**
Sec. 601	GRANTS TO STATES FOR ESTABLISHMENT OF REVOLVING FUNDS
Sec. 602	CAPITALIZATION GRANT AGREEMENTS
Sec. 603	WATER POLLUTION CONTROL REVOLVING LOAN FUNDS
Sec. 604	ALLOTMENT OF FUNDS.
Sec. 605	CORRECTIVE ACTION
Sec. 606	AUDITS, REPORTS, AND FISCAL CONTROLS; INTENDED USE PLAN.
Sec. 607	AUTHORIZATION OF APPROPRIATIONS

Appendix-4 PI (Performance Indicator)

Performance indicators (PIs) can be considered as a management tool to evaluate the degree of undertaking's efficiency and effectiveness.
Efficiency is the extent to which the resources of an undertaking are utilized to provide the services, e.g. maximizing services delivery by the minimum use of available resources.
Effectiveness is the extent to which declared or imposed objectives, such as levels of services, are achieved.
PIs can also be used for quantitative comparative assessment of performance.
This quantitative comparison can be conducted between undertakings, or historically within an undertaking comparing the past and present or actual performance against pre-defined target.
In Japanese national guideline namely "Guideline for Improving O&M of Wastewater Systems", 2007 Japan Sewage Works Association, PIs are composed of Context Information (CI) for undertaking, system and district, Performance Indicators (PI) for operation, users, services, management and environment and References. CIs and PIs of the Japanese guideline are shown in followings:

Context information (CI) Context information means background information of a district about legal framework, geological conditions, population, and capacity of facilities, conditions for operation and maintenance, and environment. CIs are composed of 25 items and categorized as follows. (i) Characteristics of an undertaking 9 items (name of undertaking, application of local public entity law, name of project, scale of project, number of employee, etc.) (ii) Characteristics of a project 12 items (population in administrative district, served population, population density, service ratio, etc.) (iii) Characteristics of a district 4 items (annual rainfall, average temperature, future population (100 in 2000), classification of receiving water body, etc.)
Performance Indicators (PI) Performance indicator means indicator to evaluate quantitatively results and levels of operation and maintenance service. PIs are composed of 56 items, and categorized as follows.

Remarks: PI (Performance Indicator) is a monitoring indicator during three year change. "↑" shows the increased values for improved direction based on calculation formula, and "↓" shows the declined value for improved direction.

PI: Performance Indicator
Statistical data shall be accumulated automatically = Institutional design

Category	Performance Indictor (PI)	Calculation Formula	Improvement direction
1. Operation (sewers) (7 items)			
Op10	Ratio of age of facility(sewer)	Total length of sewers exceeding life time / Total length of sewers maintained x 100	↓
Op20	Ratio of inspected sewer	Total length of inspected sewers / Total length of sewers maintained x 100	↑
Op30	Ratio of repaired sewer	Total length of repaired sewers / Total length of sewers maintained x 100	↑
Op40	Ratio of inspected house connection	Number of inspected house connection / Total number of house connection x 100	↑
Op50	Number of repaired house connection (per 100,000))	Number of repaired house connection / Total number of house connection x 100,000	↑
Op60	Number of collapse per 1 km of sewer	Number of collapse / Total length of sewers maintained	↓
Op70	Maintenance cost per 1 m of sewer	Maintenance cost for sewers / Total length of sewers	↓
2. Operation (wastewater treatment) (12 items)			
Ot10	Ratio of age of main equipment	Total age of main equipment / Total average life time of main equipment x 100	↓
Ot20	Ratio of marginal wastewater treatment capacity	(1- Daily maximum DWF / Design capacity for DWF) x 100	↑
Ot30	Ratio of emergency power source security	Number of WWTPs with emergency power source Total number of WWTPs x 100	↑
Ot40	Ratio of earthquake resistant facilities	Number of earthquake-resistant buildings /Number of buildings to be earthquake-resistance x 100	↑
Ot50	Compliance with discharge standard (BOD)	Number of tests complied with standard (BOD) / Total number of tests (BOD) x.100	↑
Ot60	Compliance with standard (COD)	Number of tests complied with standard (COD) / Total number of tests (COD) x.100	↑
Ot70	Compliance with standard (SS)	Number of tests complied with standard (SS) /Total number of tests (SS) x.100	↑
Ot80	Compliance with standard (T-N)	Number of tests complied with standard (T-N) /Total number of tests (T-N) x.100	↑
Ot90	Compliance with standard (T-P)	Number of tests complied with standard (T-P) /Total number of tests (T-P) x.100	↑
Ot100	Compliance with standard of odor	Number of tests complied with standard of odor / Total number of tests of odor x.100	↑
Ot110	Unit power consumption (wastewater treatment)	Power consumed (wastewater treatment) / Total wastewater treated	↓

Ot120	Unit disinfection chemical usage	Annual consumption of chemical / Total wastewater treated	↓
3. User Service (17 items)			
U10	Provision of storm water drainage	Area with storm water drainage / Total planning area x 100	↑
U20	Compliance with legal water quality standard for water body (BOD)	Number of samples complied with legal standard (BOD) / Total number of legal tests (BOD) x 100	↑
U30	Compliance with legal water quality standard for water body (COD)	Number of samples complied with legal standard (COD) / Total number of legal tests (COD) x 100	↑
U40	Compliance with legal water quality standard for water body (SS)	Number of samples complied with legal standard (SS) / Total number of legal tests (SS) 100	↑
U50	Compliance with legal water quality standard for water body (T-N)	Number of samples complied with legal standard (T-N) / Total number of legal tests (T-N) x 100	↑
U60	Compliance with legal water quality standard for water body (T-P)	Number of samples complied with legal standard (T-P) / Total number of legal tests (T-P) x 100	↑
U70	Compliance with legal water quality standard for water body (E-coli)	Number of samples complied with legal standard (E-coli) / Total number of legal tests (E-coli) x 100	↑
U80	Sewer Blockages (per 100,000 persons)	Number of sewer blockages / Served population x 100,000	↓
U90	Third party accidents (per 100,000 persons)	Number of third party accidents / Served population x 100,000	↓
U100	Complaints (per 100,000 persons)	Number of complaints / Served population x 100,000	↓
U110	Response to complaints	Number of complaints responded within one week / Total number of complaints x 100	↑
U120	Service charge (residential)	According to local government	–
U130	Unit operating cost per person (O&M)	Operating cost (O&M) / Served population	↓
U140	Unit capital cost (capital)	Capital cost (wastewater) / Served population	↓
U150	Unit cost (O&M + capital)	Cost (wastewater) / Served population	↓
U160	Unit revenue per staff	Revenue / Number of staff	↑
U170	Unit revenue water per staff	Annual volume of revenue water / Number of staff	↑
4. Management (13 items)			
M10	Unit revenue water per person per day	(Annual revenue water / number of days) / Served population	↑
M20	Accounted-for water	Annual accounted-for water / Total treated wastewater x.100	↑
M30	Current balance	Gross earning / Total cost x 100	↑
M40	Transfer ratio (profitable earning)	Transfer / Profitable earning x 100	↓
M50	Transfer ratio (capital earning)	Transfer / Capital earning x 100	↓
M60	Unit revenue	Total revenue / Total accounted-for water	↑
M70	Unit wastewater treatment cost	Wastewater treatment cost / Total accounted-for water	↓

M80	Unit wastewater treatment cost (O&M)	Wastewater treatment cost (O&M) / Total accounted-for water	↓
M90	Unit wastewater treatment cost (capital)	Wastewater treatment cost (capital) / Total accounted-for water	↓
M100	Cost covering ratio	Service charge revenue / Wastewater treatment cost x 100	↑
M110	Cost covering ratio (O&M)	Service charge revenue / Wastewater treatment cost (O&M) x 100	↑
M120	Cost covering ratio (capital cost)	Service charge revenue / Wastewater treatment cost (capital) x 100	↑
M130	Working accidents (per 1 million m3 treated wastewater)	Number of accidents which caused 4 days of absence or more / Total wastewater treated x 1,000,000	↓
5. Environment (7 items)			
E10	Pollutant reduction ratio in dry weather (BOD)	(1 - Effluent BOD / Inflow BOD) x 100	↑
E20	Wastewater reuse	Wastewater reused / Total wastewater treated by advanced treatment x 100	↑
E30	Sludge recycle ratio	Sludge recycled / Total sludge generated x 100	↑
E40	GHG emission per person	GHG emission by sewerage service in terms of CO2 / Served population	↓
E50	Compliance with standard for discharge to sewerage	Number of compliance with standard / Total number of samples x 100	↑
E60	Service ratio of advanced treatment for environmental standard	Population served by advanced treatment / Served population x 100	↑
E70	Improvement of combined system	Area for which combined system was improved (ha) / Total area of combined system (ha) x 100	↑

"References"
References mean indicators which are utilized for determination of higher policy or measure such as fulfillment of environmental policy, and enhancement of accountability and understanding of customers. References are composed with 34 items and categorized as follows.

(i) Indicators for management analysis
8 items (Annual facility improvement ratio, total cost coverage ratio, average depreciation ratio, etc. indicators required when local public entity act is applied)

(ii) Indicators for high degree analysis
12 items (Rehabilitation of aged sewers, ratio of earthquake resistant sewers, cost for countermeasures against flooding, etc. indicators for enhancement of various users understanding)

(iii) Other indicators
14 items (energy cost, qualification holding ratio, repair cost for wastewater treatment plant, etc. indicators for more detailed management analysis)

Source: Guideline for improving O&M of wastewater systems Japan Sewage Works Association

Appendix-5 Governor Decree NO. 41 OF 2016 MASTER PLAN

Governor Decree NO. 41 OF 2016MASTER PLAN FOR THE DEVELOPMENT OF INFRASTRUCTURE AND MEANS OF DOMESTIC WASTE WATER MANAGEMENT

Bahasa Indonesia	English
SALINAN GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA PERATURAN GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA NOMOR 41 TAHUN 2016 TENTANG RENCANA INDUK PENGEMBANGAN PRASARANA DAN SARANA PENGELOLAAN AIR LIMBAH DOMESTIK DENGAN RAHMAT TUHAN YANG MAHA ESA GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA,	COPY GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA REGULATION OF THE GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA NO. 41 OF 2016 ABOUT MASTER PLAN FOR THE DEVELOPMENT OF INFRASTRUCTURE AND MEANS OF DOMESTIC WASTE WATER MANAGEMENT BY THE GRACE OF GOD ALMIGHTY GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA,
Menimbang : a. bahwa berdasarkan Peraturan Gubernur Nomor 122 Tahun 2005 telah diatur mengenai Pengelolaan Air Limbah Domestik di Provinsi Daerah Khusus Ibukota Jakarta; b. bahwa Master Plan Pengelolaan Air Limbah Domestik di Provinsi Daerah Khusus Ibukota Jakarta telah disusun pada tahun 2012 dan dalam rangka mendukung Program National Capital Integrated Coastal Development (NCICD) serta peningkatan pelayanan air limbah domestik di Provinsi Daerah Khusus Ibukota Jakarta diperlukan percepatan pengelolaan air limbah domestik; c. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a dan huruf b serta untuk melaksanakan ketentuan Pasal 50 Peraturan Daerah Nomor 1 Tahun 2012 tentang Rencana Tata Ruang Wilayah 2030, perlu menetapkan Peraturan Gubernur tentang Rencana Induk Pengembangan Prasarana dan Sarana Pengelolaan Air Limbah Domestik;	**Considering:** a. that based on Governor Regulation No. 122 of 2005 has been set on Domestic Waste Water Management in the Special Province of Jakarta; b. that the Master Plan for Water Management of Domestic Waste in the Special Province of Jakarta have been prepared in 2012 and in order to support Program National Capital Integrated Coastal Development (NCICD) as well as the improvement of services of domestic wastewater in the Special Province of Jakarta required acceleration of domestic waste water management; c. Based on the considerations as meant in letters a and b as well as to implement the provisions of Article 50 Regional Regulation No. 1 Year 2012 on Spatial Planning in 2030, this Regulation of Governors on Master Plan Development Infrastructure Domestic Waste Water Management;
Mengingat : 1. Undang-Undang Nomor 17 Tahun 2003 tentang Keuangan Negara; 2. Undang-Undang Nomor 25 Tahun 2004 tentang Sistem Perencanaan Pembangunan Nasional; 3. Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang; 4. Undang-Undang Nomor 29 Tahun 2007 tentang Pemerintahan Provinsi Daerah Khusus Ibukota Jakarta sebagai Ibukota Negara Kesatuan Republik Indonesia; 5. Undang-Undang Nomor 25 Tahun 2009 tentang Pelayanan Publik; 6. Undang-Undang Nomor 28 Tahun 2009 tentang Pajak	**Given:** 1. Law No. 17 Year 2003 on State Finance; 2. Law No. 25 Year 2004 on National Development Planning System; 3. Law No. 26 Year 2007 on Spatial Planning; 4. Law No. 29 Year 2007 concerning the Government of Special Province of Jakarta as the Capital of the Republic of Indonesia; 5. Law No. 25 of 2009 on Public Service; 6. Law No. 28 Year 2009 on Regional Taxes and Levies; 7. Law No. 32 of 2009 on the Protection and Environmental Management;

Daerah dan Retribusi Daerah; 7. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup; 8. Undang-Undang Nomor 36 Tahun 2009 tentang Kesehatan; 9. Undang-Undang Nomor 1 Tahun 2011 tentang Perumahan dan Kawasan Permukiman; 10. Undang-Undang Nomor 12 Tahun 2011 tentang Pembentukan Peraturan Perundang-undangan; 11. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah sebagaimana telah beberapa kali diubah terakhir dengan Undang-Undang Nomor 9 Tahun 2015; 12. Peraturan Pemerintah Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air; 13. Peraturan Pemerintah Nomor 27 Tahun 2012 tentang Izin Lingkungan; 14. Peraturan Menteri Pekerjaan Umum Nomor 16 Tahun 2008 tentang Kebijakan dan Strategis Nasional Pengembangan Sistem Pengelolaan Air Limbah Permukiman (KSNP-SPALP); 15. Keputusan Menteri Lingkungan Hidup Nomor 112 Tahun 2003 tentang Baku Mutu Air Limbah Domestik; 16. Peraturan Daerah Nomor 10 Tahun 1991 tentang Perusahaan Daerah Pengelolaan Air Limbah Daerah Khusus Ibukota Jakarta sebagaimana telah diubah dengan Peraturan Daerah Nomor 7 Tahun 2014; 17. Peraturan Daerah Nomor 5 Tahun 2007 tentang Pokok-pokok Pengelolaan Keuangan Daerah; 18. Peraturan Daerah Nomor 7 Tahun 2010 tentang Bangunan Gedung; 19. Peraturan Daerah Nomor 1 Tahun 2012 tentang Rencana Tata Ruang Wilayah 2030; 20. Peraturan Daerah Nomor 3 Tahun 2012 tentang Retribusi Daerah sebagaimana telah diubah dengan Peraturan Daerah Nomor 1 Tahun 2015; 21. Peraturan Daerah Nomor 7 Tahun 2012 tentang Prasarana, Sarana dan Utilitas Umum; 22. Peraturan Daerah Nomor 3 Tahun 2013 tentang Pengelolaan Sampah; 23. Peraturan Daerah Non-ior 1 Tahun 2014 tentang Rencana Detail Tata Ruang dan Peraturan Zonasi; 24. Peraturan Daerah Nomor 12 Tahun 2014 tentang Organisasi Perangkat Daerah; 25. Peraturan Gubernur Nomor 122H Tahun 2005 tentang Pengelolaan Air Limbah Domestik di Provinsi Daerah Khusus Ibukota Jakarta; 26. Peraturan Gubernur Nomor 69 Tahun 2013 tentang Baku Mutu Air Limbah; 27. Peraturan Gubernur Nomor 230 Tahun 2014 tentang Organisasi dan Tata Kerja Badan Pengelola Lingkungan Hidup; 28. Peraturan Gubernur Nomor 257 Tahun 2014 tentang	8. Law No. 36 Year 2009 on Health; 9. Law No. 1 of 2011 on Housing and Settlement Region; 10. Law No. 12 Year 2011 on the Establishment of Legislation; 11. Law No. 23 Year 2014 concerning Regional Government as amended by Law No. 9 of 2015; 12. Government Regulation No. 82 Year 2001 on the Management of Water Quality and Water Pollution Control; 13. Government Regulation No. 27 Year 2012 regarding the Environmental Permit; 14. Regulation of the Minister of Public Works No. 16 Year 2008 on National Policy and Strategic Development Wastewater Management Systems Settlements (KSNP-SPALP); 15. Minister of Environment Decree No. 112 of 2003 concerning Domestic Wastewater Quality Standard; 16. Regional Regulation No. 10 Year 1991 on the Company Wastewater Jakarta Special Capital Region, as amended by Regional Regulation No. 7 of 2014; 17. Regional Regulation No. 5 of 2007 on the Principles of Financial Management; 18. Regional Regulation No. 7 of 2010 on Building; 19. Regional Regulation No. 1 Year 2012 on Spatial Planning in 2030; 20. Regional Regulation No. 3 of 2012 on regional levies as amended by Regional Regulation No. 1 of 2015; 21. Regional Regulation No. 7 of 2012 on Infrastructure, Infrastructure and Public Utilities; 22. Regional Regulation No. 3 of 2013 on Waste Management; 23. Non-ior Local Regulation 1 of 2014 on Detailed Spatial Plan and Zoning Regulations; 24. Regional Regulation No. 12 of 2014 concerning the regional Organization; 25. Governor Regulation No. 122H Year 2005 on Domestic Waste Water Management in the Special Province of Jakarta; 26. Governor Regulation No. 69 Year 2013 on Wastewater Quality Standard; 27. Governor Regulation No. 230 of 2014 on the Organization and Work Environment Management Agency; 28. Governor Regulation No. 257 of 2014 on the Organization and Work Agency for Water Management; 29. Governor Regulation No. 273 of 2014 on the Organization and Work Procedure Wastewater Company Jakarta Special Capital Region;

Organisasi dan Tata Kerja Dinas Tata Air; 29. Peraturan Gubernur Nomor 273 Tahun 2014 tentang Organisasi dan Tata Kerja Perusahaan Daerah Pengelolaan Air Limbah Daerah Khusus Ibukota Jakarta;	
MEMUTUSKAN : Menetapkan: PERATURAN GUBERNUR TENTANG RENCANA INDUK PENGEMBANGAN PRASARANA DAN SARANA PENGELOLAAN AIR LIMBAH DOMESTIK.	**DECIDED:** REGULATION OF THE GOVERNOR OF THE MASTER PLAN FOR THE DEVELOPMENT OF INFRASTRUCTURE AND FACILITIES MANAGEMENT OF DOMESTIC WASTE WATER.
BAB I **KETENTUAN UMUM** **Pasal 1** Dalam Peraturan Gubernur ini yang dimaksud dengan : 1. Daerah adalah Provinsi Daerah Khusus Ibukota Jakarta. 2. Pemerintah Daerah adalah Gubernur dan Perangkat Daerah sebagai unsur penyelenggara Pemerintahan Daerah. 3. Gubernur adalah Kepala Daerah Provinsi Daerah Khusus Ibu Kota Jakarta. 4. Badan Pengelola Lingkungan Hidup Daerah yang selanjutnya disingkat BPLHD adalah Badan Pengelola Lingkungan Hidup Daerah Provinsi Daerah Khusus Ibukota Jakarta. 5. Dinas Tata Air adalah Dinas Tata Air Provinsi Daerah Khusus Ibukota Jakarta. 6. Satuan Kerja Perangkat Daerah yang selanjutnya disingkat SKPD adalah Satuan Kerja Perangkat Daerah Provinsi Daerah Khusus Ibukota Jakarta. 7. Air Limbah adalah air yang berasal dari sisa kegiatan proses produksi dan usaha lainnya yang tidak dimanfaatkan kembali. 8. Grey Water adalah air limbah non toilet yang berasal dari dapur (tempat cuci piring), air bekas cuci pakaian (air dari saluran pembuangan mesin cuci) dan air mandi (bukan dari toilet). 9. Black Water adalah air limbah toilet yang mengandung kotoran manusia. 10. Air Limbah Domestik adalah air limbah yang berasal dari kegiatan rumah tangga, perumahan, rumah susun, apartemen, perkantoran, rumah sakit, mall, pasar, swalayan, hotel, industri, sekolah baik berupa grey water ataupun air limbah toilet black water. 11. Pengelolaan Air Limbah Domestik adalah upaya memperbaiki kualitas air limbah agar memenuhi baku mutu air limbah yang ditetapkan sehingga layak untuk dibuang ke saluran kota/ drainase. 12. Instalasi Pengolahan Air Limbah yang selanjutnya disingkat IPAL adalah suatu perangkat peralatan teknik beserta perlengkapannya untuk mengolah air limbah. 13. Instalasi Pengolahan Air Limbah Komunal yang selanjutnya disebut IPAL Komunal adalah IPAL yang melayani beberapa sambungan rumah dalam satu kawasan dan bersifat lokal. 14. Instalasi Pengolahan Lumpur Tinja yang selanjutnya	**PART I** **GENERAL REQUIREMENTS** **Article 1** Governor Regulation have the following meanings: 1. The area is a Special Province of Jakarta. 2. Local Government is the Governor and the Region as part of administrators of Regions. 3. The Governor is the Chief Provincial Jakarta Special Capital Region. 4. Badan Pengelola Lingkungan Hidup Daerah hereinafter abbreviated BPLHD is the Regional Environmental Management Agency of Special Province of Jakarta. 5. Dinas Tata Air is the Office of Water Management for Special Province of Jakarta. 6. Satuan Kerja Perangkat Daerah hereinafter abbreviated SKPD is SKPD Special Province of Jakarta. 7. Wastewater is water that comes from the rest of the production process and other businesses that are not used again. 8. Grey Water is a non-toilet waste water coming from the kitchen (dishwasher), water used to wash clothes (water from the drain washer) and a water bath (not on the toilet). 9. Black Water is toilet waste water containing human waste. 10. Domestic waste water is wastewater generated from domestic activities, houses, flats, apartments, offices, hospitals, mall, markets, supermarkets, hotels, industries, schools either gray water or black water toilet waste water. 11. Domestic Waste Water Management is the effort to improve the quality of waste water in order to meet the water quality standards set so that proper sewage to be discharged into the channel town / drainage. 12. Instalasi Pengolahan Air Limbah hereinafter abbreviated IPAL is a device engineering equipment and equipment to treat wastewater. 13. Instalasi Pengolahan Air Limbah Komunal, hereinafter referred IPAL Komunal is serving multiple connections houses in one neighborhood and local. 14. Treatment Plants for sewerage hereinafter

disingkat IPLT adalah suatu perangkat peralatan teknik beserta perlengkapannya untuk mengolah lumpur tinja yang berasal dari tangki septik. 15. Sistem Setempat adalah sistem pengolahan air limbah dimana sumber air limbah, instalasi pengumpul dan pengolahannya terletak dalam satu lokasi, seperti tangki septik, IPAL yang permanen, maupun yang berpindah-pindah (mobilc). 16. Sistem Terpusat adalah sistem pengelolaan air limbah dimana air limbah dari tiap sumbernya terhubung melalui jaringan pipa pengumpul, yang untuk kemudian disalurkan melalui pipa pembawa menuju instalasi pengolahan bersama/terpusat. 17. Izin Linkungan adalah izin yang diberikan kepada setiap orang yang melakukan usaha dan/atau kegiatan yang wajib Amdal atau Upaya Pengelolaan Lingkungan dan Upaya Pemantauan Lingkungan (UKL-UPL) dalam rangka perlindungan dan pengelolaan lingkungan hidup sebagai prasyarat untuk memperoleh izin usaha dan/atau kegiatan. 18. National Capital Integrated Coastal Development yang selanjutnya disingkat NCICD adalah program perlindungan wilayah pesisir berupa pembangunan tanggul yang terintegrasi dengan pengembangan kawasan Pantura Jakarta. 19. Perusahaan Daerah Pengelolaan Air Limbah yang selanjutnya disebut PD PAL Jaya adalah Perusahaan Daerah yang mempunyai bidang usaha dalam pengolahan air limbah di Provinsi Daerah Khusus Ibukota Jakarta. 20. Public Private Partnership yang selanjutnya disingkat PPP merupakan suatu kerja sama antara sektor publik (pemerintah) dengan pihak swasta dalam konteks pembangunan infrastruktur dan pelayanan.	abbreviated IPLT is a device engineering equipment and supplies for treating sludge from the septic tank. 15. Local System is a wastewater treatment system where the source of the waste water, collecting and processing plant located in a single location, such as septic tanks, wastewater permanent, as well as nomadic (mobile). 16. Centralized System is a waste water management system where waste water from any source connected through a network of collection pipes, which is then piped to the treatment plant carrier joint / centralized. 17. Permit environments is a license granted to any person doing business and / or activity requiring Amdal or Environmental Management Effort and Environmental Monitoring Effort (UKL-UPL) in the framework of environmental protection and management as a prerequisite for obtaining a business license and / or activity. 18. National Capital Integrated Coastal Development hereinafter abbreviated NCICD is a program of protection of coastal areas such as construction of dikes that are integrated with the development of Jakarta North region. 19. Perusahaan Daerah Pengelolaan Air Limbah, hereinafter referred PD PAL Jaya is a Regional company that has business in the field of wastewater treatment in the Special Province of Jakarta. 20. 20. Public Private Partnership hereinafter abbreviated as PPP is a partnership between the public sector (government) with the private sector in the context of the development of infrastructure and services.
BAB II **MAKSUD DAN TUJUAN** **Pasal 2** Peraturan Gubernur ini dimaksudkan sebagai pedoman bagi aparat pelaksana dalam upaya pengembangan prasarana dan sarana pengelolaan air limbah. Pasal 3 Tujuan Peraturan Gubernur ini adalah untuk meningkatkan akses fasilitas pengelolaan air limbah domestik yang berkelanjutan di Daerah.	**CHAPTER II** **PURPOSE AND OBJECTIVES** **Article 2** Governor Regulation is intended as a guide for the implementing agency in the development of infrastructure and facilities for waste water management. Article 3 The purpose of this Governor Regulation is to improve access to domestic waste water management facilities are sustainable in the Region.
BAB III **RUANG LINGKUP** **Pasal 4** (1) Ruang lingkup rencana induk pengembangan prasarana dan sarana Pengelolaan Air Limbah Domestik mencakup pengolahan sistem terpusat dan pengolahan sistem setempat yang mengacu pada Master Plan Pengelolaan	**CHAPTER III** **SCOPE** **Article 4** (1) The scope of the master plan for development of infrastructure and facilities Domestic Wastewater processing system includes a centralized and local system processing which

Air Limbah Tahun 2012. (2) Target pengembangan prasarana dan sarana Pengelolaan Air Limbah Domestik sebagaimana dimaksud pada ayat (1) adalah dengan upaya percepatan pengelolaan air limbah untuk mendukung program NCICD. (3) Rencana induk pengembangan prasarana dan sarana Pengelolaan Air Limbah Domestik sebagaimana dimaksud pada ayat (1), disusun dengan mempertimbangkan kondisi fisik dan lingkungan, kependudUkan, sosial budaya serta ekonomi.	refers to the Wastewater Management Master Plan in 2012. (2) Target the development of infrastructure and facilities Domestic Wastewater Management referred to in paragraph (1) is the efforts to accelerate the wastewater management to support program NCICD. (3) The master plan development of infrastructure and facilities Domestic Wastewater Management referred to in paragraph (1), prepared by considering the physical and environmental conditions, demographic, socio-cultural and economic.
BAB IV **PENGELOLAAN AIR LIMBAH** **Bagian Kesatu** **Umum** **Pasal 5** Pengelolaan air limbah domestik sebagaimana dimaksud dalam Pasal 4 ayat (1) terdiri atas pengolahan : a. Sistem Terpusat; dan b. Sistem Setempat.	**CHAPTER IV** **WASTE WATER MANAGEMENT** **Part One** **General** **Article 5** Domestic waste water management as referred to in Article 4 paragraph (1) shall consist of processing: a. Centralized system; and b. Local system.
Bagian Kedua **Pengolahan Sistem Terpusat**	**The second part** **Centralized Processing System**
Pasal 6 (1) Zona pengelolaan air limbah domestik dengan Pengolahan Sistem Terpusat terbagi dalam 15 (lima belas) zona yang meliputi 14 (empat belas) zona baru dan 1 (satu) zona eksisting yaitu zona 0 (nol) sebagaimana tercantum dalam Lampiran Peraturan Gubernur ini. (2) Zona baru pengelolaan air limbah domestik sebagaimana dimaksud pada ayat (1) memiliki IPAL pada lokasi berikut : a. Zona 1 (satu) di sisi barat Waduk Pluit dengan luas 4 ha (empat hektar); b. Zona 2 (dua) di Muara Angke dengan luas 0,8 ha (nol koma delapan hektar); c. Zona 3 (tiga) di Kawasan Hutan Kota Srengseng dan/atau lahan sekitarnya dengan luas 4 ha (empat hektar); d. Zona 4 (empat) dan Zona 10 (sepuluh) di Pulo Gebang dengan luas 8,7 ha (delapan koma tujuh hektar); e. Zona 5 (lima) di Hutan Kota Waduk Sunter Utara dengan luas 4,6 ha (empat koma enam hektar); f. Zona 6 (enam) di Duri Kosambi dengan luas 6 ha (enam hektar); g. Zona 7 (tujuh) di Rencana Lahan Pemakaman Kamal-Pegadungan dengan luas 3,9 ha (tiga koma sembilan hektar); h. Zona 8 (delapan) di Waduk Ma.runda dengan luas 6 ha (enam hektar); i. Zona 9 (sembilan) di Situ Rawa Rorotan dengan luas 2,9 ha (dua koma sembilan hektar);	**Article 6** (1) Zoneing domestic waste water management with the Processing System Centralized divided in 15 (fifteen) zone covering 14 (fourteen) new zones and 1 (one) zones existing a zone 0 (zero) as contained in Appendix Rules This governor. (2) The new zone domestic waste water management as referred to in paragraph (1) has a WWTP in the following locations: a. Zone 1 (one) on the west side Pluit reservoir with an area of 4 ha (four hectares); b. Zone 2 (two) in Muara Angke with an area of 0.8 ha (zero point eight hectares); c. Zone 3 (three) in the area of Forest City Srengseng and / or adjacent land with an area of 4 ha (four hectares); d. Zone 4 (four) and Zone 10 (ten) in Pulo Gebang with an area of 8.7 ha (eight point seven hectares); e. Zone 5 (five) in Sunter Utara Reservoir Forest City with an area of 4.6 hectares (four point six hectares); f. Zone 6 (six) in Duri Kosambi with an area of 6 ha (six hectares); g. Zone 7 (seven) in the Plan of Land Cemetery Kamal- Pegadungan with an area 3.9 ha (three point nine hectares); h. Zone 8 (eight) in Reservoir Ma.runda with an area of 6 ha (six hectares);

j. Zona 11 (sebelas) a di Waduk Ulujami dengan luas 5,9 ha (lima koma sembilan hektar); k. Zona 11 (sebelas) b di Taman Bendi dengan luas 3 ha (tiga hektar); l. Zona 12 (dua belas) di Kawasan Kebun Binatang Ragunan dengan luas 3,1 ha (tiga koma satu hektar); m. Zona 13 (tiga belas) di Waduk Kampung Dukuh dengan luas 5,7 ha (lima koma tujuh hektar); dan n. Zona 14 (empat belas) di Waduk RW 05 Ceger dengan luas 3,6 ha (tiga koma enam hektar). o. Rencana percepatan pengelolaan air limbah domestik Sistem Terpusat sebagaimana dimaksud pada ayat (1) terdiri dari : a. Tahap 1 (satu) periode 2015-2022 meliputi pembangunan 1. zona 1 (satu); 2. zona 2 (dua); 3. zona 3 (tiga); 4. zona 4 (empat); 5. zona 5 (lima); 6. zona 6 (enam); 7. zona 7 (tujuh); 8. zona 8 (delapan); dan 9. zona 10 (sepuluh). b. Tahap 2 (dua) periode 2023-2030 meliputi pembangunan 1. zona 9 (sembilan); 2. zona 11 (sebelas) a; 3. zona 11 (sebelas) b; 4. zona 12 (dua belas); 5. zona 13 (tiga belas); dan 6. zona 14 (empat belas).	i. Zone 9 (nine) in Situ Rawa Rorotan with an area of 2.9 hectares (two point nine hectares); j. Zone 11 (eleven) in Reservoir Ulujami with a spacious 5.9 ha (five point nine hectares); k. Zone 11 (eleven) b in Taman Bendi with an area of 3 ha (three hectares); l. Zone 12 (twelve) in Region Ragunan Zoo with an area of 3.1 ha (three point one hectare); m. Zone 13 (thirteen) in Kampung Dukuh reservoir with an area of 5.7 ha (five point seven hectares); and n. Zone 14 (fourteen) in RW 05 Ceger reservoir with an area of 3.6 ha (three point six hectares). Plan to accelerate domestic waste water management Centralized System as referred to in paragraph (1) shall consist of: a. Phase 1 (one) in the period 2015-2022 includes the construction 1. Zone 1 (one); 2. Zone 2 (two); 3. Zone 3 (three); 4. Zone 4 (four); 5. Zone 5 (five); 6. Zone 6 (six); 7. Zone 7 (seven); 8. Zone 8 (eight); and 9. zone 10 (ten). b. Phase 2 (two) in the period 2023-2030 includes the construction 1. Zone 9 (nine); 2. Zone 11 (eleven) a; 3. Zone 11 (eleven) b; 4. Zone 12 (twelve); 5. Zone 13 (thirteen); and 6. Zone 14 (fourteen).
Pasal 7 (1) Luas lahan IPAL Zona Baru sebagaimana dimaksud dalam Pasal 6 ayat (2) disesuaikan dengan hasil kajian dan apabila penggunaan lahan kurang dari ketentuan sebagaimana dimaksud dalam Pasal 6 ayat (2), maka sisa lahannya harus dijadikan sebagai Ruang Terbuka Hijau (RTH) atau Ruang Terbuka Biru (RTB). (2) IPAL yang dibangun sebagaimana dimaksud dalam Pasal 6 ayat (2) akan dilengkapi dengan instalasi pengolahan lumpur tangki septik. (3) Pembangunan tahap 1 (satu) sebagaimana dimaksud dalam Pasal 6 ayat (3) huruf a diprioritaskan untuk mendukung Program NCICD. (4) Teknologi IPAL Sistem Terpusat mempertimbangkan ketersediaan lahan, kemudahan operasional dan perawatan serta baku mutu air di masa depan. (5) Pembangunan IPAL berikut prasarana dan sarana pendukungnya di lokasi sebagaimana dimaksud dalam Pasal 6 ayat (2) harus memperhatikan ketentuan sebagai berikut : a. melengkapi izin lingkungan; b. mempertahankan fungsi utama Ruang Terbuka Hijau (RTH) pada lokasi sub zona H.2 (Taman Kota); c. mempertahankan kapasitas Waduk pada lokasi sub zona B.1 (Ruang Terbuka Biru);	**Article 7** (1) The land area WWTP New Zone as referred to in Article 6 paragraph (2) adjusted to the results of the study and if the land use is less than the provisions referred to in Article 6 paragraph (2), then the rest of the land should be used as a green open space (RTH) or Open space Blue (RTB). (2) WWTP built as referred to in Article 6 paragraph (2) shall be equipped with septic tank sludge treatment plant. (3) Construction of phase 1 (one) as referred to in Article 6 paragraph (3) letter a priority to support NCICD Program. (4) Technology Centralized System WWTP consider land availability, ease of operation and maintenance and water quality standards in the future. (5) Development of infrastructure and facilities WWTP following supporters in the location referred to in Article 6 paragraph (2) shall observe the following provisions: a. complete the environmental permit; b. retain the main function of Green Open Space (RTH) in the sub zone location H.2 (Park City); c. maintain the capacity of reservoirs on the

d. terkamuflase; dan e. diselenggarakan oleh Pemerintah dan/atau Badan Usaha Milik Daerah (BUMD)/Badan Usaha Milik Negara (BUMN) pada sub zona P.3 (Pemerintahan Daerah). (6) Target rasio pelayanan pengelolaan air limbah domestik melalui pengolahan Sistem Terpusat sampai tahun 2022 sebesar 65% (enam puluh lima persen).	location of the sub zone B.1 (Open Space Blue); d. camouflaged; and e. organized by the Government and / or Regional-Owned Enterprises (BUMN) / State Owned Enterprises (SOEs) in the sub zone P.3 (Local Government). (6) Target ratio of domestic waste water management services through a centralized system of processing up to 2022 of 65% (sixty five percent).
Bagian Ketiga **Pengolahan Sistem Setempat**	**part three** **Processing Local System**
Pasal 8 (1) Pengelolaan air limbah domestik melalui pengolahan Sistem Setempat terdiri dari : a. memodifikasi tangki septik konvensional yang dapat mengolah sekaligus Black Water dan Grey Water dengan desain yang memudahkan untuk penyedotan lumpur; b. pembangunan IPAL Komunal; c. melaksanakan penyedotan lumpur tinja secara berkala di seluruh zona; d. mengintegrasikan IPLT Duri Kosambi dan IPLT Pulo Gebang dengan IPAL yang baru dibangun; dan e. mengintegrasikan pengolahan lumpur tinja dari fasilitas setempat dengan IPAL di seluruh zona. (2) Target rasio pelayanan pengelolaan air limbah domestik melalui pengolahan Sistem Setempat sampai tahun 2022 sebesar 35% (tiga puluh lima persen).	**Article 8** (1) The management of domestic wastewater through the treatment system The local consists of: a. modifying a conventional septic tank which can process at once Black Water and Grey Water with a design that makes it easy to suction sludge; b. Communal WWTP construction; c. implement sludge suction periodically throughout the zone; d. integrating IPLT Duri Kosambi and Pulo Gebang waste treatment plant with a newly built WWTP; and e. integrating the sludge treatment of local WWTP facilities throughout the zone. (2) Target ratio of domestic waste water management services through the Local System processing until 2022 of 35% (thirty five percent).
BAB V **PELAKSANA** **Bagian Kesatu** **Pelaksana SKPD**	**CHAPTER V** **IMPLEMENTING** **part One** **Implementing SKPD**
Pasal 9 (1) BPLHD bertugas sebagai pembina dan pengawas kualitas air buangan ke badan air penerima hasil pengolahan air limbah. (2) Dinas Tata Air bertugas sebagai regulator, instansi teknis, pengawas dan pengendali pengelolaan air limbah dan kualitas hasil pengolahan air limbah yang dilaksanakan oleh operator serta pengamanan prasarana dan sarana pengelolaan air limbah. (3) Pemerintah Daerah dapat bekerja sama dengan instansi pemerintah/instansi lainnya terkait dengan pengelolaan air limbah.	**Article 9** (1) BPLHD served as manager and supervisor of the wastewater to a quality of receiving water bodies results wastewater treatment. (2) Water Manageing Office serves as a regulator, technical institutions, supervisory and controlling the management of waste water and the quality of the waste water treatment is carried out by the operator as well as the security infrastructure and facilities for waste water management. (3) local governments can work together with government agencies / institutions related to wastewater management.
Bagian Kedua **Pelaksana Badan Usaha Milik Daerah**	**The second part** **Implementing Regional-Owned Enterprises**
Pasal 10 (1) PD PAL Jaya bertugas sebagai operator pengelolaan air limbah di Daerah. (2) Pemerintah Daerah dapat menugaskan Badan Usaha Milik Daerah untuk membantu proyek pembangunan	**Article 10** (1) PD PAL Jaya served as an operator of water management waste in the Region. (2) The regional government may assign Local Owned Enterprises to assist Wastewater

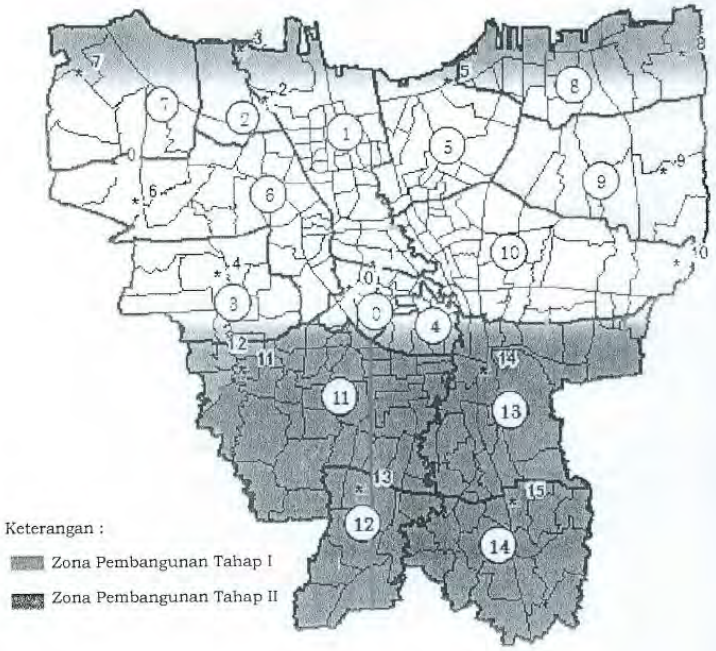
Infrastruktur Air Limbah termasuk persiapan lelang. (3) Tata membantu cara penugasan proyek Infrastruktur Badan Usaha Air Limbah Milik Daerah sebagaimana untuk dimaksud pada ayat (2), dilaksanakan sesuai dengan ketentuan peraturan perundangan-undangan.	Infrastructure development projects including tender preparation. (3) Tata assists with project assignments Wastewater Infrastructure Owned Enterprises of the region's referred to in paragraph (2) shall be administered in accordance with the provisions of legislation.
BAB VI **PEMBIAYAAN**	**CHAPTER VI** **FINANCING**
Pasal 11 Pembiayaan untuk pengelolaan air limbah domestik bersumber dari a. APBN (Anggaran Pendapatan dan Belanja Negara); b. APBD (Anggaran Pendapatan dan Belanja Daerah); c. pinjaman, d. hibah; e. PPP; dan f. sumber pendanaan lain yang sah dan tidak mengikat sesuai dengan ketentuan peraturan perundang-undangan.	**Article 11** Financing for the management of domestic waste water sourced from a. APBN (Budget of the State); b. APBD (Regional Budget); c. Loan; d. grant; e. PPP; and f. Other funding sources are legitimate and are not binding in accordance with the provisions of the legislation.
BAB VII **KETENTUAN PENUTUP**	**CHAPTER VII** **CLOSING**
Pasal 12 Pada saat Peraturan Gubernur ini mulai berlaku, ketentuan Pasal 6 dan Lampiran I Peraturan Gubernur Nomor 122 Tahun 2005 tentang Pengelolaan Air Limbah Domestik,dicabut dan dinyatakan tidak berlaku.	**Article 12** At the time of Governor Regulation comes into force, the provisions of Article 6 and Annex I of Governor Regulation No. 122 Year 2005 on Domestic Waste Water Management, revoked and declared invalid.
Pasal 13 Peraturan Gubernur ini mulai berlaku pada tanggal diundangkan. Agar setiap orang mengetahuinya, memerintahkan pengundangan Peraturan Gubernur ini dengan penempatannya dalam Berita Daerah Provinsi Daerah Khusus Ibukota Jakarta.	**Article 13** Governor Regulation comes into force on the date of promulgation. For public cognizance, the governor of this Regulation is promulgated in the Regional Special Province of Jakarta.
Ditetapkan di Jakarta pada tanggal 25 Februari 2016 GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA, ttd. BASUKI T. PURNAMA	Stipulated in Jakarta on February 25, 2016 GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA, Signed. BASUKI T. PURNAMA
Diundangkan di Jakarta pada tanggal 4 Maret 2016 SEKRETARIS DAERAH PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA, ttd. SAEFULLAH BERITA DAERAH PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA TAHUN 2016 NOMOR 63001	Promulgated in Jakarta on March 4, 2016 SECRETARY OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA, Signed. Saefullah NEWS OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA NO. 63001 2016
Salinan sesuai dengan aslinya KEPALA BIRO HUKUM SEKRETARIAT DAERAH PROVINSI DAERAH K US /". IBUKOTA JAKARTA,	Copies of the original BUREAU CHIEF LEGAL SECRETARY OF PROVINCIAL REGIONAL K US / ".

Y AN YUHANAH NIP 196508241994032003	JAKARTA CAPITAL, Y AN YUHANAH NIP 196508241994032003
Lampiran : Peraturan Gubernur Provinsi Daerah Khusus Ibukota Jakarta Nomor 41 TAHUN 2016 Tanggal 25 Februari 2016 LOKASI IPAL DAN LUAS SETIAP ZONA PENGOLAHAN AIR LIMBAH **Keterangan :** Zona Pembangunan Tahap I Zona Pembangunan Tahap II LOKASI DAN LUAS SETIAP ZONA Zona No. No. IPAL Lokasi IPAL Area (ha) 0 0 Kali Krukut Rencana 1 Waduk Setiabudi Eksisting 1 2 Waduk Pluit 4 2 3 Muara Angke 0,8 3 4 Hutan Kota Srengseng 4 4 Transfer ke IPAL Zona 10 1,6 5 5 Hutan Kota Waduk Sunter Utara 4,6 6 6 Duri Kosambi 6 7 7 Kamal-Pegadungan 3,9 8 8 Rencana Waduk Marunda 6 9 9 Rencana Situ Rawa Rorotan 2,9 10 10 Pulo Gebang 8,7 11 11 Taman Bendi 3 12 Rencana Waduk Ulujami 5,9 12 13 Kebun Binatang Ragunan 3, 1 13 14 Rencana Waduk Kampung Dukuh 5,7 14 15 Rencana Waduk RW 05 Ceger 3,6	**Appendix:** Special Province Governor Regulation Capital Jakarta No. 41 OF 2016 Date of February 25, 2016 LOCATION AND AREA OF EACH ZONE WWTP WASTE WATER TREATMENT **Information :** Development Zone Phase I Phase II Development Zone LOCATION AND AREA OF EACH ZONE Zone No. No. WWTP WWTP Location Area (ha) 0 0 Krukut Plan 1 Existing Setiabudi Reservoir 1 2 4 Pluit Reservoir 2 3 Muara Angke 0.8 3 4 4 Srengseng Forest City 4 Transfer to the WWTP Zone 10 1.6 5 5 Forest City North Sunter Reservoir 4.6 6 6 Duri Kosambi 6 7 7 Kamal-Pegadungan 3.9 8 8 Reservoir Plan Marunda 6 9 9 plan Situ Rawa Rorotan 2.9 10 10 8.7 Pulo Gebang 11 11 Taman Bendi 3 12 Reservoir Plan Ulujami 5.9 12 13 Ragunan Zoo 3, 1 13 14 Reservoir Plan Kampung Dukuh 5.7 14 15 RW 05 Ceger Reservoir Plan 3.6
GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA, ttd. BASUKI T. PURNAMA	GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA, Signed. BASUKI T. PURNAMA

Lampiran : Peraturan Gubernur Provinsi Daerah Khusus Ibukota Jakarta

Nomor 41 TAHUN 2016
Tanggal 25 Februari 2016

LOKASI IPAL DAN LUAS SETIAP ZONA PENGOLAHAN AIR LIMBAH



LOKASI DAN LUAS SETIAP ZONA

No. Zona	No. IPAL	Lokasi IPAL	Area (ha)
0	0	Kali Krukut	Rencana
	1	Waduk Setiabudi	Eksisting
1	2	Waduk Pluit	4
2	3	Muara Angke	0,8
3	4	Hutan Kota Srengseng	4
4		Transfer ke IPAL Zona 10	1,6
5	5	Hutan Kota Waduk Sunter Utara	4,6
6	6	Duri Kosambi	6
7	7	Kamal-Pegadungan	3,9
8	8	Rencana Waduk Marunda	6
9	9	Rencana Situ Rawa Rorotan	2,9
10	10	Pulo Gebang	8,7
11	11	Taman Bendi	3
	12	Rencana Waduk Ulujami	5,9
12	13	Kebun Binatang Ragunan	3,1
13	14	Rencana Waduk Kampung Dukuh	5,7
14	15	Rencana Waduk RW 05 Ceger	3,6

GUBERNUR PROVINSI DAERAH KHUSUS
IBUKOTA JAKARTA,

ttd.

BASUKI T. PURNAMA

Appendix-6 GOVERNOR REGULATION ON PIU NUMBER 1658 YEAR 2016

Bahasa	English
GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA KEPUTUSAN GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA NOMOR 1658 TAHUN 2016 TENTANG PENETAPAN KEPALA DINAS TATA AIR SEBAGAI PROJECT IMPLEMENTATION UNIT PELAKSANA PENGEMBANGAN PENGELOLAAN AIR LIMBAH SISTEM TERPUSAT DENGAN RAHMAT TUHAN YANG MAHA ESA GUBERNUR PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA,	GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA DECISION OF THE GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA NUMBER 1658 YEAR 2016 ABOUT DETERMINATION OF WATER AS THE HEAD OFFICE OF GOVERNANCE PROJECT IMPLEMENTATION UNIT IMPLEMENTING DEVELOPMENT SYSTEM WASTEWATER MANAGEMENT FOCUS BY THE GRACE OF GOD ALMIGHTY GOVERNOR OF THE SPECIAL CAPITAL PROVINCE OF JAKARTA,
Menimbang: a. bahwa berdasarkan Peraturan Gubernur Nomor 41 Tahun 2016 telah diatur mengenai Rencana Induk Pengembangan Prasarana dan Sarana Pengelolaan Air Limbah Domestik: b. bahwa berdasarkan Keputusan Gubernur Nomor 944 Tahun 2014, telah ditetapkan Direktur Utama PD PAL Jaya sebagai Project Implementation Unit Pelaksana Pengembangan Pengelolaan Air Limbah Sistem Terpusat di Provinsi Daerah Khusus Ibukota Jakarta; c. bahwa dalam rangka peningkatan pengembangan pengelolaan air limbah sistem terpusat di Provinsi Daerah Khusus Ibukota Jakarta serta perkembangan pelaksanaan dan pengelolaan air limbah, perlu perkembangan pelaksanaan dan pengelolaan air limbah, maka Keputusan Gubernur sebagaimana dimaksud dalam huruf b perlu disempurnakan; d. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a, huruf b dan huruf c, perlu menetapkan Keputusan Gubernur tentang Penetapan Kepala Dinas Tata Air sebagai Project Implementation Unit Pelaksana Pengembangan Pengelolaan Air Limbah Sistem Terpusat; **Mengingat:**	**Considering**: a. that based on Governor Regulation No. 41 Year 2016 has been set on the Master Plan for Infrastructure Development of Domestic Waste Water Management: b. that by Decree No. 944 of 2014, have been assigned Director of PD PAL Jaya as a Project Implementation Unit Development Implementing Centralized Wastewater Management System in the Special Province of Jakarta; c. that in order to increase the development of wastewater management in a centralized system of Special Province of Jakarta as well as the development and implementation of wastewater management, necessary development and implementation of wastewater management, the Decision of the Governor referred to in point b must be improved; d. Based on the considerations referred to in paragraphs a, b and c, is necessary to stipulate Decree of the Governor of the Establishment of the Head of Department of Water Administration as a Project Implementation Unit Development Implementing Centralized Wastewater Management System; **In view of:**

1. Undang-Undang Nomor 29 Tahun 2007 tentang Pemerintahan Provinsi Daerah Khusus Ibukota Jakarta sebagai Ibukota Negara Kesatuan Republik Indonesia; 2. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup; 3. Undang-Undang Nomor 12 Tahun 2011 tentang Pembentukan Peraturan Perundang-undangan; 4. Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah sebagaimana telah beberapa kali diubah terakhir dengan Undang-Undang Nomor 9 Tahun 2015; 5. Peraturan Pemerintah Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air; 6. Peraturan Presiden Nomor 38 Tahun 2015 tentang Kerjasama Pemerintah dengan Badan Usaha Dalam Penyediaan Infrastruktur; 7. Peraturan Daerah Nomor 1 Tahun 2012 tentang Rencana Tata Ruang Wilayah 2030; 8. Peraturan Daerah Nomor 6 Tahun 2012 tentang Rencana Pembangunan Jangka Panjang Daerah 2005-2025; 9. Peraturan Daerah Nomor 2 Tahun 2013 tentang Rencana Pembangunan Jangka. Menengah Daerah 2013-2017; 10. Peraturan Daerah Nomor 12 Tahun 2014 tentang Organisasi Perangkat Daerah; 11. Peraturan Gubernur Nomor 257 Tahun 2014 tentang Organisasi dan Tata Kerja Dinas Tata Air; 12. Peraturan Gubernur Nomor 41 Tahun 2016 tentang Rencana Induk Pengembangan Prasarana dan Sarana Pengelolaan Air Limbah Domestik; **MEMUTUSKAN :** **Menetapkan :** KEPUTUSAN GUBERNUR TENTANG PENETAPAN KEPALA DINAS TATA AIR SEBAGAI PROJECT IMPLEMENTATION UNIT PELAKSANA PENGEMPANGAN PENGELOLAAN AIR LIMBAH SISTEM TERPUSAT. **KESATU:**	1. Law Number 29 Year 2007 concerning the Government of Special Province of Jakarta as the Capital of the Republic of Indonesia; 2. Law Number 32 of 2009 on the Protection and Environmental Management; 3. Law Number 12 Year 2011 on the Establishment of Legislation; 4. Law Number 23 Year 2014 concerning Regional Government as amended by Law No. 9 of 2015; 5. Government Regulation No. 82 of 2001 on the Management of Water Quality and Water Pollution Control; 6. Presidential Regulation No. 38 Year 2015 concerning Government Cooperation with Business Entities in the Provision of Infrastructure; 7. Regional Regulation No. 1 Year 2012 on Spatial Planning in 2030; 8. Regional Regulation No. 6 of 2012 on Regional Long Term Development Plan 2005-2025; 9. Regional Regulation No. 2 of 2013 on-Term Development Plan. Medium 2013-2017; 10. Regional Regulation No. 12 of 2014 concerning the regional Organization; 11. Governor Regulation No. 257 of 2014 on the Organization and Work Agency for Water Management; 12. Governor Regulation No. 41 Year 2016 on Master Plan Development Infrastructure Domestic Waste Water Management; **DECIDED:** **Assign:** DECREE CONCERNING THE ESTABLISHMENT OF THE HEAD OFFICE OF THE GOVERNOR OF WATER SYSTEM AS PROJECT IMPLEMENTATION UNIT IMPLEMENTING PENGEMPANGAN WASTEWATER MANAGEMENT SYSTEM FOCUS. **FIRST:** Establish Head of Water Administration as a Project Implementation Unit Development Implementing Centralized Wastewater Management System. **SECOND :**

Menetapkan Kepala Dinas Tata Air sebagai Project Implementation Unit Pelaksana Pengembangan Pengelolaan Air Limbah Sistem Terpusat.	Project Implementation Unit (PIU) as referred to in the FIRST dictum has the task:
KEUDA:	
Project Implementation Unit (PIU) sebagaimana dimaksud pada diktum KESATU mempunyai tugas :	
a. memastikan bahwa seluruh pelaksanaan Proyek Pengembangan Air Limbah Sistem Terpusat (Sewerage System Development Project) di Provinsi Daerah Khusus Ibukota Jakarta sesuai dengan prosedur pengelolaan dan ketentuan peraturan perundang-undangan;	a. ensure that the entire implementation of the Development Project Centralized Wastewater Systems (Sewerage System Development Project) in the Province of Jakarta Special Capital Region in accordance with the management procedures and the provisions of the legislation;
b. melaksanakan koordinasi, monitoring dan pengawasan pelaksanaan kegiatan;	b. coordinating, monitoring and supervision of the implementation of activities;
c. melaksanakan persiapan, pengorganisasian dan penganggaran kegiatan;	c. carry out the preparation, organization and budgeting activities;
d. melaksanakan penyiapan lahan terkait Proyek Pengembangan Air Limbah Sistem Terpusat;	d. carry out land preparation related Development Project Centralized Wastewater Systems;
e. memberikan fasilitasi dan pendampingan teknis bagi kegiatan penyusunan DED, perizinan yang dibutuhkan dan pelaksanaan konstruksi Pengembangan Pengelolaan Air Limbah Sistem Terpusat;	e. provides facilitation and technical assistance for the preparation of DED activities, licensing is required and construction Development Centralized Wastewater Management System;
f. melaksanakan peyusunan kajiand/okumen lingkungan Proyek Pengembangan Air Limbah Sistem Terpusat (Sewerage System Development Project) di Provinsi Daerah Khusus Ibukota Jakarta;	f. provides implement assessment / environmental documentation Development Project Centralized Wastewater Systems (Sewerage System Development Project) in the Special Province of Jakarta;
g. melaksanakan kegiatan-kegiatan pendukung dalam pengimplementasian proyek;	g. carrying out support activities in the implementation of the project;
h. melaksanakan perencanaan teknis dan penyiapan dokumen pengadaan barang/ jasa;	h. carrying out technical planning and preparation of documents procurement of goods / services;
i. melaksanakan pengoperasian, pengelolaan dan pelaporan hasil kegiatan;	i. carry out the operation, management and reporting of results of operations;
j. melakukan identifikasi, pengolahan bahan terkait aspek pengendalian dampak lingkungan dan sosial; dan	j. the identification, processing of materials related control aspects of environmental and social impacts; and
k. memberikan saran dan masukan terhadap pelaksanaan Proyek Pengembangan Air Limbah Sistem Terpusat (Sewerage System Development Project) di Provinsi Daerah Khusus Ibukota Jakarta dari aspek lingkungan dan sosial.	k. provides advice and input to the implementation of the Development Project Centralized Wastewater Systems (Sewerage System Development Project) in the Province of Jakarta Special Capital Region of environmental and social aspects.
KETIGA :	**THIRD:**
Unit Pelaksana Proyek sebagaimana dimaksud pada diktum KESATU bertanggung jawab kepada Gubernur serta sebagai Penanggung Jawab Proyek Kerjasama (PJPK) Air Limbah Sistem Terpusat di	Project Implementation Unit referred to in the FIRST dictum shall be responsible to the Governor as well as the Responsible Partnership Project (PJPK) Wastewater Systems Centered in the Special Province of Jakarta, which is under the coordination of the Regional Secretary and in charge since the

Provinsi Daerah Khusus Ibukota Jakarta yang berada di bawah koordinasi Sekretaris Daerah dan bertugas sejak masa persiapan, perencanaan hingga pelaksanaan Proyek Pengembangan Air Limbah Sistem Terpusat (Sewerage System Development Project).

KEEMPAT:

Biaya yang diperlukan dalam rangka kelancaran pelaksanaan tugas Unit Pelaksana Proyek sebagaimana dimaksud pada diktum KESATU dibebankan pada Anggaran Pendapatan dan Belanja Daerah (APBD) melalui Dokumen Pelaksanaan Anggaran (DPA) Dinas Tata Air Provinsi Daerah Khusus Ibukota Jakarta serta sumber-sumber lain yang sah.

KELIMA:

Pada saat Keputusan Gubernur ini mulai berlaku, Keputusan Gubernur Nomor 944 Tahun 2014 tentang Penetapan Direktur Utama PD PAL Jaya sebagai Project Implementation Unit Pelaksana Pengembangan Pengelolaan Air Limbah Sistem Terpusat di Provinsi Daerah Khusus Ibukota Jakarta, dicabut dan dinyatakan tidak berlaku.

KEENAM :

Keputusan Gubernur ini mulai berlaku pada tanggal ditetapkan.

Ditetapkan di Jakarta

pada tanggal 18 Juli 2016

GUBERNUR POVINSI DAERAH KHUSUS IBUKOTA JAKARTA

BASUKI T. PURNAMA

Tembusan :

1. Wakil Gubernur Provinsi DKI Jakarta , Sekretaris Daerah Provinsi DKI Jakarta
2. Sekretaris Daerah Provinsi DKI Jakarta
3. Asisten Pembangunan dan Lingkungan Hidup Sekda Provinsi DKI Jakarta
4. Inspektur Provinsi DKI Jakarta
5. Kepala Badan Perencanaan Pembangunan Daerah Provinsi DKI Jakarta
6. Kepala Badan Pengelola Keuangan dan Aset Daerah Provinsi DKI Jakarta
7. Kepala Dinas Tata Air Provinsi DKI Jakarta
8. Kepala Dinas Penataan Kota Provinsi DKI Jakarta

time of preparation, planning and execution of the Project Centralized Wastewater Systems development (Sewerage System development Project).

FOURTH:

Fee required in order to smooth the implementation of the Project Implementation Unit tasks referred to in the FIRST dictum charged to the Income and Expenditure Budget (APBD) through the Budget Implementation Document (DPA) Air Planning Office of Special Province of Jakarta as well as other sources are legitimate.

FIFTH:

At the time of the governor's decision comes into force, Decree No. 944 of 2014 on the Establishment of Director of PD PAL Jaya as a Project Implementation Unit Development Implementing Centralized Wastewater Management System in the Special Province of Jakarta, is revoked and declared invalid.

SIXTH:

Decree comes into force on the date specified.

Set in Jakarta

on July 18, 2016

GOVERNOR OF THE CAPITAL POVINSE JAKARTAA

CC:

1. Vice Governor of DKI Jakarta, Jakarta Provincial Secretary
2. The Provincial Secretary of Jakarta
3. Development and Environment Assistant Secretary of Jakarta
4. Inspector Jakarta
5. Head of Regional Development Planning Agency of Jakarta
6. Head of the Financial Management Board and Asset Jakarta
7. Head of Jakarta Water Administration
8. The Head of Jakarta City Planning
9. Head of the Legal Secretariat DKI Jakarta Province
10. Head of City Planning and the Environment Secretariat of the Province of Jakarta

9. Kepala Biro Hukum Setda Provinsi DKI Jakarta 10. Kepala Biro Penataan Kota dan Lingkungan Hidup Setda Provinsi DKI Jakarta	

Appendix-7 Wastewater Discharge Standard-No.68/2016

Wastewater Discharge Standard-No.68/201 Ministry of Environment and Forestry

MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN **REPUBLIK INDONESIA** PERATURAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA NOMOR P. 68/Menlhk/Setjen/Kum.1/8/2016 TENTANG BAKU MUTU AIR LIMBAH DOMESTIK DENGAN RAHMAT TUHAN YANG MAHA ESA MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA,	MINISTER of ENVIRONMENT and FORESTRY of the REPUBLIC of INDONESIA REGULATION of the MINISTER of ENVIRONMENT and FORESTRY REPUBLIC of INDONESIA Number P. 68/Menlhk/Secretariat/Kum. 1/8/2016 ABOUT The QUALITY of THE RAW DOMESTIC WASTE WATER with THE GRACE of GOD ALMIGHTY MINISTER of ENVIRONMENT and FORESTRY of the REPUBLIC of INDONESIA,
Menimbang	Whereas
a. bahwa untuk melaksanakan ketentuan Pasal 20 ayat (2) huruf b Undang-undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, Menteri mengatur ketentuan mengenai baku mutu air limbah; b. bahwa air limbah domestik yang dihasilkan dari skala rumah tangga dan usaha dan/atau kegiatan berpotensi mencemari lingkungan, sehingga perlu dilakukan pengolahan air limbah sebelum dibuang ke media lingkungan; c. bahwa berdasarkan ketentuan sebagaimana dimaksud dalam huruf a dan huruf b, perlu menetapkan Peraturan Menteri Lingkungan Hidup dan Kehutanan tentang Baku Mutu Air Limbah Domestik;	a. that to implement the provisions of article 8 paragraph (2) letter b Act No. 32 of 2009 on the protection and management of the environment, the Ministers set conditions regarding the quality of raw waste water; b. that the domestic wastewater generated from household and business scale and/or activities could potentially pollute the environment, so that the waste water treatment needs to be done before it is dumped into the environmental media; c. that based on the provisions referred to letter a and letter b, need to establish the regulation of the Minister of Environment and Forestry of Raw Domestic Wastewater Quality;
Mengingat	Recalling
1. Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup (Lembaran Negara Republik Indonesia Tahun 2009 Nomor 140, Tambahan Lembaran Negara Republik Indonesia Nomor 5059); 2. Peraturan Pemerintah Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air (Lembaran Negara Republik Indonesia Tahun 2001 Nomor 153, Tambahan Lembaran Negara Republik Indonesia Nomor 4161); 3. Peraturan Presiden Nomor 16 Tahun 2015 tentang Kementerian Lingkungan Hidup dan Kehutanan (Lembaran Negara Republik Indonesia Tahun 2015 Nomor 17);	1. Act No. 32 of 2009 on the Protection and Management of Environment (State Gazette of the Republic of Indonesia Number 140 in 2009, an additional Sheet of the Republic of Indonesia Number 5059); 2. Government Regulation Number 82 in 2001 about water quality Management and Control of Water Pollution (State Gazette of the Republic of Indonesia Number 153 in 2001, an additional Sheet of the Republic of Indonesia Number 4161); 3. Presidential Regulation number 16 by 2015 of the Minister of Environment and Forestry (State Gazette of the Republic of Indonesia by 2015 number 17); 4. Regulation of the Minister of Environment and Forestry Number p. 18/MenLHK-II/2015 about the Organization and the work of the Minister of Environment and Forestry (Republic Indonesia by

4. Peraturan Menteri Lingkungan Hidup dan Kehutanan Nomor P.18/ MenLHK-II/2015 tentang Organisasi dan Tata Kerja Kementerian Lingkungan Hidup dan Kehutanan (Berita Negara Republik Indonesia Tahun 2015 Nomor 713);	2015 Number 713);
MEMUTUSKAN: PERATURAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN TENTANG BAKU MUTU AIR LIMBAH DOMESTIK.	DECIDED: REGULATION OF THE MINISTER OF ENVIRONMENT AND FORESTRY OF RAW DOMESTIC WASTE WATER QUALITY.
Pasal 1	Article 1
Dalam Peraturan Menteri ini yang dimaksud dengan: 1. Air limbah adalah air sisa dari suatu hasil usaha dan/ atau kegiatan. 2. Air limbah domestik adalah air limbah yang berasal dari aktivitas hidup sehari-hari manusia yang berhubungan dengan pemakaian air. 3. Baku mutu air limbah adalah ukuran batas atau kadar unsur pencemar dan atau jumlah unsur pencemar yang ditenggang keberadaannya dalam air limbah yang akan dibuang atau dilepas ke dalam sumber air dari suatu usaha dan atau kegiatan. 4. Izin'lingkungan adalah izin yang diberikan kepada setiap orang yang melakukan Usaha dan/atau Kegiatan yang wajib Amdal atau UKL-UPL dalam rangka perlindungan dan pengelolaan lingkungan hidup sebagai prasyarat memperoleh izin Usaha dan/atau Kegiatan. 5. Surat Pernyataan Kesanggupan Pengelolaan dan Pemantauan Lingkungan Hidup yang selanjutnya disebut SPPL adalah pernyataan kesanggupan dari penanggung jawab usaha dan/atau kegiatan untuk melakukan dan pemantauan lingkungan hidup atas dampak lingkungan hidup dari usaha dan/atau kegiatannya di luar Usaha dan/atau kegiatan yang wajib amdal atau UKL-UPL. 6. Daya tampung beban pencemaran air adalah kemampuan air pada suatu sumber air untuk menerima masukan beban pencemaran tanpa mengakibatkan air tersebut menjadi cemar. 7. Alokasi beban pencemaran air adalah besaran beban pencemar yang masih diperbolehkan untuk dibuang atau besaran beban pencemar yang harus diturunkan di wilayah administrasi dan/atau DAS dari masing-masing sumber pencemar. 8. Sumber air adalah wadah air yang terdapat di atas dan di bawah permukaan tanah, termasuk dalam pengertian ini akuifer, mata air, sungai, rawa, danau, situ, waduk, dan muara. 9. Badan Usaha adalah Badan Usaha Milik Negara, Badan Usaha Milik Daerah, badan usaha swasta yang berbentuk Perseroan Terbatas, badan hukum asing, atau koperasi.	In this ministerial regulation is: 1. Wastewater is water left over from a business results and/or activities. 2. Domestic wastewater is wastewater that comes from daily living activities related to human use of water. 3. The quality of the raw wastewater is the size limit or the levels of contaminant elements and elements or the number of polluters that tolerated its existence in wastewater will be disposed or discharged into the water source from a business or activity. 4. Izin' lingkungan is a permission that is granted to any person who is doing business and/or activities that are mandatory or UKL AMDAL-UPL in order protection and environmental management as prerequisites to obtain a business license and/or activities. 5. Affidavit of capable management and monitoring of the environment hereinafter called SPPL is a statement of willingness of the person in charge of business and/or activity to conduct environmental monitoring and environmental impact over the life of the business and/or its activities outside of the Business and/or activities that are mandatory or UKL AMDAL-UPL. 6. Water pollution load capacity is the ability of the water at a water source to receive the input of the load without resulting in contamination of the water becomes blackened. 7. The allocation of the burden of water pollution is the magnitude of the burden of polluters who are still allowed to be discarded or the magnitude of the burden of the polluters must be unloaded in the territory of the Administration and/or DAS from each source polluters. 8. The source of water is the water containers found above and below the surface of the ground, including in the sense of these aquifers, springs, rivers, swamps, lakes, reservoirs, and the estuary. 9. Business entity is a State-owned enterprise, Regional-owned enterprises, private businesses in the form of a limited liability company, a legal entity, foreign or cooperative. 10. Point of compliance is one or more locations that made reference to monitoring in order to comply the raw quality of leachate.

10. Titik penaatan adalah satu lokasi atau lebih yang dijadikan acuan untuk pemantauan dalam rangka penaatan baku mutu lindi. 11. Pemerintah Daerah adalah gubernur, bupati atau walikota dan perangkat daerah sebagai unsur penyelenggara pemerintah daerah. 12. Pemerintah Pusat adalah Presiden Republik Indonesia yang memegang kekuasaan pemerintahan negara Republik Indonesia yang dibantu oleh Wakil Presiden dan menteri sebagaimana dimaksud dalam Undang-Undang Dasar Negara Republik Indonesia Tahun 1945. 13. Menteri adalah menteri yang menyelenggarakan urusan pemerintahan di bidang perlindungan dan pengelolaan lingkungan hidup.	11. Local Government is the Governor, Regent or mayor and other areas as the organizer of the local government. 12. The Central Government is the President of the Republic of Indonesia that holds the powers of the Government of the Republic of Indonesia that is assisted by the Vice President and Secretary as stipulated in the Constitution of the Republic of Indonesia in 1945. 13. The Minister is the Minister of the organizing affairs of the Government in the field of the protection and management of the environment.
Pasal 2	Article 2
Peraturan Menteri ini bertujuan untuk memberikan acuan mengenai baku mutu air limbah domestik kepada: a. Pemerintah Daerah provinsi dalam menetapkan baku mutu air limbah domestik yang lebih ketat; b. Pemerintah Pusat, Pemerintah Daerah provinsi, dan Pemerintah Daerah kabupaten/kota, dalam menerbitkan izin lingkungan, SPPL dan/atau izin pembuangan air limbah; dan c. penanggung jawab usaha dan/ atau kegiatan pengolahan air limbah domestik dalam menyusun perencanaan pengolahan air limbah domestik, dan penyusunan dokumen lingkungan hidup.	Regulation of the Minister aims to provide guidance regarding domestic waste water quality standards to: a. Provincial Local Government in setting water quality standards more strict domestic waste water area; b. Central Government, Local Government Provincial and Local Government district / city, in issuing environmental permits, SPPL and / or wastewater discharge permit; and c. Responsibility of a business and / or activities of domestic wastewater in planning domestic wastewater, and the preparation of environmental documents.
Pasal 3	Article 3
(1) Setiap usaha dan/atau kegiatan yang menghasilkan air limbah domestik wajib melakukan pengolahan air limbah domestik yang dihasilkannya. (2) Pengolahan air limbah domestik sebagaimana dimaksud pada ayat (1) dilakukan secara: a. tersendiri, tanpa menggabungkan dengan pengolahan air limbah dari kegiatan lainnya; atau b. terintegrasi, melalui penggabungan air limbah dari kegiatan lainnya ke dalam satu sistem pengolahan air limbah. (3) Pengolahan air limbah secara tersendiri sebagaimana dimaksud pada ayat (2) huruf a wajib memenuhi baku mutu air limbah sebagaimana tercantum dalam Lampiran I yang merupakan bagian tidak terpisahkan dari Peraturan Menteri ini. (4) Perrgolahan air limbah secara terintegrasi sebagaimana dimaksud pada ayat (2) huruf b wajib memenuhi baku mutu air limbah yang dihitung berdasarkan ketentuan sebagaimana tercantum dalam Lampiran II yang merupakan bagian tidak terpisahkan dari Peraturan Menteri ini. (5) Baku mutu air limbah domestik sebagaimana dimaksud pada ayat (3) dan ayat (4) setiap saat tidak boleh terlampaui.	(1) *Every effort and/or activities that generate domestic wastewater treatment obligatory domestic it generates.* (2) Domestic wastewater treatment as referred to subsection (1) is carried out: a. The individual, without combining with waste water treatment from the other activities; or b. Integrated, through the merger of the waste water from other activities into one wastewater treatment system. (3) Individual wastewater treatment as referred to paragraph (2) letter a compulsory meet quality raw water waste as listed in Annex I which is part an integral part of the regulation of the Minister. (4) Integrated waste water treatment as referred to paragraph (2) letter b is obligated to meet the raw quality of waste water are calculated based on conditions as listed in annex II which are part an integral part of the regulation of the Minister. (5) Quality of raw domestic waste water as referred to paragraph (3) and paragraph (4) at any time must not be exceeded.
Pasal 4	Article 4
(1) Terhadap pengolahan air limbah domestik, wajib	(1) Domestic wastewater treatment required monitoring

dilakukan pemantauan untuk mengetahui pemenuhan ketentuan baku mutu air limbah. (2) Pemantauan sebagaimana dimaksud pada ayat (1) dilakukan untuk memenuhi ketentuan persyaratan teknis antara lain: a. menjamin seluruh air limbah domestik yang dihasilkan masuk ke instalasi pengolahan air limbah domestik; b. menggunakan instalasi pengolahan air limbah domestik dan saluran air limbah domestik kedap air sehingga tidak terjadi perembesan air limbah domestik ke lingkungan; c. memisahkan saluran pengumpulan air limbah domestik dengan saluran air hujan; d. melakukan pengolahan air limbah domestik, sehingga mutu air limbah domestik yang dibuang ke sumber air tidak melampaui baku mutu air limbah domestik; e. tidak melakukan pengenceran air limbah domestic ke dalam aliran buangan air limbah domestik; f. menetapkan titik penaatan untuk pengambilan contoh uji air limbah domestik dan koordinat titik penaatan; dan g. memasang alat ukur debit atau laju alir air limbah domestik di titik penaatan. (3) Hasil pemantauan sebagaimana dimaksud pada ayat (2) disusun secara tertulis yang mencakup: a. catatan air limbah domestik yang diproses harian; b. catatan debit dan pH harian air limbah domestik;dan c. hasil analisa laboratorium terhadap air limbah domestik yang dilakukan paling sedikit 1 (satu) kali dalam 1 (satu) bulan. (4) Hasil pemantauan sebagaimanan dimaksud pada ayat (3) dilaporkan secara berkala paling sedikit 1 (satu) kali dalam 3 (tiga) bulan kepada bupati/walikota dengan tembusan gubernur, Menteri dan instansi terkait sesuai dengan ketentuan peraturan perundangan-undangan.	to find out the fulfillment of the conditions of raw waste water quality. (2) Monitoring as referred to subsection (1) to comply with the technical requirements, among others: a. Ensure the entire generated domestic wastewater goes into domestic wastewater treatment plant b. Using the installation of wastewater treatment of domestic waste water and domestic water-proofed so there happen permeation of domestic waste water into the environment; c. Separating domestic waste-water collection channel with channel rain water; d. Conduct of domestic wastewater treatment, so that the quality of domestic wastewater are dumped into a water source is not beyond raw domestic waste water quality; e. Do not do waste water dilution of domestic waste water to flow into the domestic waste; f. Set point of compliance to test sampling of domestic wastewater and the coordinates of the point of compliance; and g. Install the gauge discharge or flow rate of the domestic waste water at the point of compliance. (3) The results of the monitoring referred to paragraph (2) was compiled in writing which includes: a. Record domestic waste water being processed daily; b. Debit notes and the daily domestic waste water pH; and c. analysis the laboratory against domestic wastewater which is done at least 1 (one) time within 1 (one) month. (4) Results of the monitoring of referred to paragraph (3) is reported at regular intervals of at least 1 (one) time in 3 (three) months to the Regent/Mayor with copy Governor, Minister and relevant agencies in accordance with the provisions of regulation.
Pasal 5	Article 5
(1) Setiap usaha dan/atau kegiatan pengolahan air limbah domestik, wajib memiliki prosedur operasional standar pengolahan air limbah domestik dan sistem tanggap darurat. (2) Dalam hal terjadi pencemaran akibat kondisi tidak normal, penanggungjawab usaha dan/atau kegiatan pengolahan air limbah domestik sebagaimana dimaksud pada ayat (1) wajib melaporkan dan menyampaikan kegiatan penanggulangan pencemaran kepada bupati/walikota, dengan tembusan kepada gubernur dan Menteri paling lama 1 x 24 (satu kali dua puluh empat) jam.	(1) Every effort and/or domestic wastewater treatment, is required to have standard operating procedures for domestic wastewater treatment and emergency response system. (2) In the event of pollution due to abnormal conditions, responsible business and/or domestic waste water treatment activities as referred to paragraph (1) mandatory reporting of pollution prevention activities and convey to the Regent/Mayor, with copy to the Governor and Secretary of the longest 1 x 24 (one of twenty-four) hours.
Pasal 6	Article 6
Dalam hal setiap usaha dan/atau kegiatan yang menghasilkan air limbah domestik sebagaimana dimaksud dalam Pasal 3 ayat (1) tidak mampu mengolah air limbah domestik yang dihasilkannya,	In case of any business and/or activities that generate domestic wastewater as stipulated in article 3 paragraph (1) is not capable of processing domestic wastewater it generates waste water treatment,

pengolahan air limbah domestic wajib diserahkan kepada pihak lain yang usaha dan/atau kegiatannya mengolah air limbah domestik.	domestic mandatory submission to the other party the effort and/or domestic waste water processing activities.
Pasal 7	Article 7
(1) Pihak lain yang usaha dan/atau kegiatannya mengolah air limbah domestik sebagaimana dimaksud dalam Pasal 6 wajib memiliki izin lingkungan dan izin pembuangan air limbah. (2) Ketentuan lebih lanjut mengenai tatacara perizinan lingkungan dan perizinan pembuangan air limbah sebagaimana dimaksud pada ayat (1) dilaksanakan sesuai ketentuan peraturan perundang-undangan.	(1) The other party's business and/or domestic waste water processing activities referred to article 6 required to have environmental permits and permit disposal of wastewater. (2) The provisions on the procedures of licensing and licensing environment wastewater disposal as referred to paragraph (1) was carried out in accordance with the legislation.
Pasal 8	Article 8
(1) Pemerintah Pusat dan/atau Pemerintah Daerah menyediakan dan mengelola sarana dan prasarana pengolahan air limbah domestik yang berasal dari skala rumah tangga. (2) Penyediaan dan pengelolaan sarana dan prasarana pengolahan air limbah domestik sebagaimana dimaksud pada ayat (1) dapat dilakukan melalui kerjasama dengan badan usaha. (3) Penanggung jawab sarana dan prasarana pengolahan air limbah domestik sebagaimana dimaksud pada ayat (1) dan ayat (2) wajib memenuhi ketentuan: a. memiliki izin lingkungan atau SPPL; b. memiliki izin pembuangan air limbah; dan c. baku mutu air limbah domestik sebagaimana tercantum dalam Lampiran I Peraturan Menteri ini. (4) Ketentuan lebih lanjut mengenai tata cara perizinan lingkungan atau SPPL, dan perizinan pembuangan air limbah sebagaimana dimaksud pada ayat (3) huruf a dan huruf b dilaksanakan sesuai dengan ketentuan peraturan perundang-undangan.	(1) Central Government and/or provincial governments provide and manage infrastructure and facilities of domestic wastewater treatment derived from a household scale. (2) Provision and management of facilities and infrastructure of domestic wastewater treatment as referred to paragraph (1) can be done through cooperation with business entities. (3) In charge of the infrastructure of the domestic wastewater treatment as referred to paragraph (1) and paragraph (2) is obligated to comply with: a. environmental clearances or SPPL; b. wastewater disposal have permission; and c. the raw water quality domestic waste as listed in Annex I of the regulation of the Minister. (4) Further Provisions regarding environmental licensing Ordinance or licensing the disposal of SPPL, and water waste as referred to paragraph (2) letter a and letter b are implemented in accordance with the provisions of the legislation.
Pasal 9	Article 9
(1) Pemerintah Daerah provinsi dapat menetapkan baku mutu air limbah domestik daerah yang lebih ketat. (2) Dalam menetapkan baku mutu air limbah domestik yang lebih ketat sebagaimana dimaksud pada ayat (1), Pemerintah Daerah provinsi wajib melakukan kajian ilmiah yang memuat paling sedikit: a. ketersediaan teknologi paling baik yang ada untuk mengolah air limbah domestik; b. karakteristik air limbah domestik; c. daya tampung beban pencemaran air dan alokasi beban pencemaran air; dan d. nilai baku mutu air limbah domestik baru.	(1) Government of the provinces can establish more strict area of raw domestic wastewater quality. (2) In determining the more strict area of raw domestic waste water quality referred to subsection (1), the regional Government of the province is obligated to do a scientific study containing at least: a. the availability of the best existing technology to process domestic waste water; b. characteristics of domestic waste water; c. a capacity load of water pollution and the allocation of the burden of water pollution; and d. the value of raw domestic sewage water quality recently.
Pasal 10	Article 10
(1) Daya tampung beban pencemaran air dan alokasi beban pencemaran air sebagaimana dimaksud dalam Pasal 9 Ayat (2) huruf c dihitung dengan memperhatikan laporan	(1) Load capacity of water pollution and water pollution load allocation referred to article 9 paragraph (2) Letter c is calculated having regard to the report of local government district/municipality which consists of:

Pemerintah Daerah kabupaten/kota yang terdiri dari: a. inventarisasi jenis dan jumlah air limbah domestic di wilayah administrasinya; b. inventarisasi jenis dan jumlah air limbah domestic yang diproses di pengolahan air limbah domestik; c. inventarisasi teknologi pengolahan air limbah domestik; dan d. pengawasan terhadap pemrosesan air limbah domestik, pengolahan air limbah domestik dan pemenuhan baku mutu air limbah domestik. (2) Laporan sebagaimana dimaksud pada ayat (1) disampaikan kepada Pemerintah Daerah provinsi dengan tembusan kepada Menteri paling sedikit 1 (satu) kali dalam 1 (satu) tahun.	a. an inventory of types and number of domestic wastewater in its administrative territory; b. inventory of types and number of domestic wastewater are processed in the processing of domestic waste water; c. inventory of domestic waste water processing technology; and d. supervision towards the processing of domestic wastewater, domestic wastewater treatment and the fulfilment of quality raw domestic wastewater. (2) The report referred to subsection (1) is submitted to the regional Government of the province with a copy to the Secretary at least one (1) times within 1 (one) year
Pasal 11	Article 11
Baku mutu air limbah domestik yang ditetapkan oleh Pemerintah Daerah provinsi sebagaimana dimaksud dalamPasal 9, wajib digunakan oleh Pemerintah Daerah provinsi dan Pemerintah Daerah kabupaten/kota dalam menerbitkan izin lingkungan dan/atau izin pembuangan air limbah, kecuali diperoleh baku mutu air limbah domestik lain yang lebih ketat melalui hasil kajian dokumen lingkungan.	Raw water quality of domestic waste water established by the local Government of the province referred to Chapter 9, mandatory use by local authorities of the province and the local government in the district/city issued the environmental permit and/or waste water disposal permit, unless the raw water quality is obtained domestic waste more strictly through the results of the study of environmental documents
Pasal 12	Article 12
(1) Menteri dan/atau Pemerintah Daerah provinsi melakukan pembinaan dan pengawasan kepada Pemerintah Daerah kabupaten/kota terhadap penerapan ketentuan baku mutu air limbah domestik. (2) Dalam melakukan pembinaan dan pengawasan sebagaimana dimaksud pada ayat (1): a. Menteri dapat memberikan mandat kepada eselon I di lingkungan Kementerian Lingkungan Hidup dan Kehutanan; dan b. Pemerintah Daerah provinsi dapat memberikan mandat kepada instansi yang bertanggungjawab di bidang lingkungan hidup tingkat provinsi. (3) Hasil pembinaan dan pengawasan sebagaimana dimaksud pada ayat (1) digunakan sebagai bahan evaluasi baku mutu air limbah domestik.	(1) Minister and/or provincial governments do coaching and supervision to the local government district/city against the application of the provisions of the water quality of the raw domestic waste water. (2) In doing coaching and supervision as referred to paragraph (1): a. Minister may give a mandate to the Echelon I at the Minister of Environment and Forestry; and b. Provincial government can give a mandate to the responsible agencies in the field of the environment the provincial level. (3) Result of coaching and supervision as referred to subsection (1) is used as an ingredient of raw water quality evaluation of domestic waste.
Pasal 13	Article 13
Pada saat Peraturan Menteri ini berlaku: a. Keputusan Menteri Negara Lingkungan Hidup Nomor 112 Tahun 2003 tentang Baku Mutu Air Limbah Domestik;dan b. Peraturan Menteri Negara Lingkungan Hidup Nomor 05 Tahun 2014 tentang Baku Mutu Air Limbah, Lampiran XLIII Usaha dan/atau kegiatan Perhotelan, Lampiran XLIV huruf A bagi Kegiatan Fasilitas Pelayanan Kesehatan dan Lampiran XLVI tentang Baku Mutu Air Limbah bagi Usaha dan/atau Kegiatan Domestik (Berita Negara Republik Indonesia Tahun 2014 Nomor 1815), dicabut dan dinyatakan tidak berlaku.	By the time the Ministerial regulation is applicable: a. Decision of the Minister of State for the Environment Number 112 in 2003 about the Raw Domestic Waste Water Quality; and b. Regulation of the Minister of State for the environment number 05 2014 about Raw waste water Quality, Appendix XLIII Efforts and/or activities of hospitality, Appendix XLIV letter A for health care Facilities and Activities Appendix XLVI of Raw waste water Quality for business and/or Domestic Activities (news of the Republic of Indonesia by 2014 the number 1815) , revoked and declared inapplicable.

Pasal 14	Article 14
Peraturan Menteri ini mulai berlaku pada tanggal diundangkan.	This Ministerial Regulation comes into force on the date of promulgation.
Agar setiap mengetahuinya, memerintahkan pengundangan Peraturan Menteri ini dengan penempatannya dalam Berita Negara Republik Indonesia. Ditetapkan di Jakarta pada tanggal 9 Agustus 2016 MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA, ttd. SITI NURBAYA	Everyone knows it, ordered the enactment of this Ministerial Regulation with its placement in the news of the Republic of Indonesia. Ditetapkan di Jakarta pada tanggal 9 Agustus 2016 MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA, ttd. SITI NURBAYA
Diundangkan di Jakarta pada tanggal 2 September 2016 DIREKTUR JENDERAL PERATURAN PERUNDANG-UNDANGAN KEMENTERIAN HUKUM DAN HAK ASASI MANUSIA REPUBLIK INDONESIA, ttd. WIDODO EKATJAHJANA BERITA NEGARA REPUBLIK INDONESIA TAHUN 2016 NOMOR 1323	Enacted in Jakarta on September 2, 2016 GENERAL DIRECTOR Legislation MINISTER OF LAW and HUMAN RIGHTS REPUBLIC of INDONESIA, ttd. WIDODO EKATJAHJANA NEWS REPUBLIC of INDONESIA YEAR 2016 NUMBER 1323
Salinan sesuai dengan asli KEPALA BIRO HUKUM, KRISNA RYA	
LAMPIRAN I PERATURAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA NOMOR P.68/Menlhk/Setjen/Kum.1/8/2016 TENTANG BAKU MUTU AIR LIMBAH DOMESTIK	**ANNEX I** The Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P. 68/Menlhk/Secretariat/Kum. 1/8/2016 About the Quality of the Raw Domestic Wastewater
BAKU MUTU AIR LIMBAH DOMESTIK TERSENDIRI	**THE RAW QUALITY OF DOMESTIC WASTEWATER**

Parameter	Satuan	Kadar maksimum*
pH	-	6 – 9
BOD	mg/L	30
COD	mg/L	100
TSS	mg/L	30
Minyak & lemak	mg/L	5
Amoniak	mg/L	10
Total Coliform	jumlah/100mL	3000
Debit	L/orang/hari	100

Keterangan: *= Rumah susun, penginapan, asrama, pelayanan kesehatan, lembaga pendidikan, perkantoran, perniagaan, pasar, rumah makan, balai pertemuan, arena rekreasi, permukiman, industri, IPAL kawasan, IPAL permukiman, IPAL perkotaan, pelabuhan, bandara, stasiun kereta api,terminal dan lembaga pemasyarakatan.	Description: * = flats, lodgings, dormitories, health services, educational institutions, offices, Commerce, markets, restaurants, meeting hall, arena leisure, settlements, industrial areas, IPAL, IPAL settlements, IPAL urban, ports, airports, railway stations, terminals and correctional institutions.
LAMPIRAN II PERATURAN MENTERI LINGKUNGAN HIDUP DAN KEHUTANAN REPUBLIK INDONESIA NOMOR P.68/Menlhk/Setjen/Kum.1/8/2016 TENTANG BAKU MUTU AIR LIMBAH DOMESTIK	**ANNEX II** REGULATION of the MINISTER of ENVIRONMENT and FORESTRY of the REPUBLIC of INDONESIA NUMBER P. 68/Menlhk/Secretariat/Kum. 1/8/2016 ABOUT the QUALITY of the RAW DOMESTIC WASTE WATER
PENGHITUNGAN BAKU MUTU AIR LIMBAH DOMESTIK TERINTEGRASI Penentuan Baku Mutu air limbah domestik pada instalasi pengolahan air limbah terintegrasi dihitung dengan menggunakan rumusan sebagai berikut:	COUNTING the RAW DOMESTIC WASTE WATER QUALITY Determination of raw water quality integrated domestic waste in wastewater treatment installation is calculated by using the formula as follows:
1. Debit air limbah paling tinggi Debit air limbah paling tinggi adalah jumlah debit tertinggi air limbah domestik senyatanya (bila ada) atau berdasarkan prakiraan dari masing-masing kegiatan dan air limbah dari kegiatan lainnya, seperti yang dinyatakan dalam persamaan berikut:	1. Wastewater Discharge height Discharge most waste water is highest is the number of the highest discharge of domestic waste water as it is (if any) or based on forecasts of individual activities and waste water from other activities, as expressed in the following equation:

$$Q_{max} = \sum_i^n Qi + \cdots . Qm$$

Keterangan

Q_{max} : Debit air limbah paling tinggi, dalam satuan m^3/waktu

Qi : Debit air limbah domestik paling tinggi dari kegiatan i, dalam satuan m^3/waktu

Qm : Debit air limbah paling tinggi dari kegiatan m, dalam satuan m^3/waktu

Keterangan Qmax : Debit air limbah paling tinggi, dalam satuan m^3 / waktu Qi: Debit air limbah domestik paling tinggi dari kegiatan dalam satuan m^3/waktu Qm: Debit air limbah paling tinggi dari kegiatan m, dalam	Description Qmax: waste water Discharge m^3/hour in units of Qi: domestic wastewater Discharge height of most of the activities in unit m^3/hour Qm: most Wastewater Discharge height of m, in units of m^3/hour

satuan m^3 / waktu	
2. Kadar air limbah gabungan paling tinggi Penentuan kadar paling tinggi pada parameter yang sama dapat ditentukan dengan cara sederhana, yaitu dengan menggunakan metoda neraca massa dengan perhitungan sebagai berikut:	2. The rate of the combined wastewater of high levels of the most Determination most high on the same parameters can be determined by simple way, namely by using the mass balance method with calculation as follows:
$C_{max} = \sum_{i}^{n} \cdot \frac{CiQi+CnQn}{Qi+Qn}$	
Keterangan Cmax kadar paling tinggi setiap parameter, dalam satuan mg/1 Ci Kadar paling tinggi setiap parameter dalam baku mutu air limbah dome stik untuk kegiatan i , dalam satuan mg/1 Qi Debit paling tinggi air limbah domestic kegiatan i, dalam satuan m^3 / waktu en Kadar paling tinggi setiap parameter dalam baku mutu air limbah untuk kegiatan n, dalam satuan mg/1 Qn Debit paling tinggi air limbah kegiatan n, dalam satuan m^3 / waktu	Description The highest levels of Cmax of each parameter, in units of mg/1 Ci high levels of most every parameter in the raw wastewater quality dome sticks to the activities i, in units of mg/1 Qi highest Discharge waste water domestic activities i, in units of m^3/hour most high Levels every parameter in the raw waste water quality for n, in units of mg/1 Qn Discharge most waste water high activity n , in units of m^3/hour
Untuk kadar parameter yang berbeda: 1. Parameter dari salah satu kegiatan lain yang tidak diatur di dalam baku mutu air limbah domestik dalam lampiran I Peraturan Menteri ini maka parameter tersebut wajib ditambahkan dalam baku mutu air limbah yang ditetapkan dalam izin.	For the levels of different parameters: 1. The parameters of one of the other activities that are not regulated in the raw water quality of domestic waste in Annex I to this regulation of the Minister the mandatory parameters are then added to the raw quality of waste water specified in the permit.
2. Dalam hal terdapat Parameter yang sama dari beberapa kegiatan lain yang tidak diatur di dalam baku mutu air limbah domestik dalam lampiran I Peraturan Menteri ini maka parameter tersebut wajib ditambahkan dalam baku mutu air limbah yang ditetapkan dalam izin dengan kadar yang paling ketat.	2. In case there is the same parameters of some of the other activities that are not regulated in the raw water quality of domestic waste in Annex I to this regulation of the Minister the mandatory parameters are then added to the raw quality of waste water specified in the permission with the most restrictive levels.

Appendix-8 The Greater Jakarta Governor Decree No. 1040 of 1997

Regarding Standard of Wastewater Quality to Sewerage in the Greater Jakarta

The Greater Jakarta Governor Decree
No. 1040 of 1997

Regarding

Standard of Wastewater Quality to Sewerage in the Greater Jakarta

The Greater Jakarta Governor

takes into account that

a. the Greater Jakarta, serving as the State Capital, leads accordingly to intensive development and population explosion in addition to growth in trade and industry, which generate subsequently solid waste as affluent from domestic, commercial building, and industry activities;
b. improper wastewater disposal disadvantages public health and affects human life security, and pollutes the environment;
c. in the frame to prevent from the environment pollution as generated by the improper wastewater disposal, preventive and mitigating measures such as among others limitation to quality and quantity of wastewater influent to the sewerage system are inevitably needed;
d. consistent with points a., b., and c. above, thereto it is mandatory to establish Standard Quality of Sewerage Wastewater in the Greater Jakarta.

bases on

1. Environment Hazard Law of 1926 (stbl 1962 No. 226);
2. Law No. 9 of 1960 regarding Health Principles;
3. Law No. 1 of 1962 regarding Hygiene for Business for Public;
4. Law No. 5 of 1974 regarding Local Government Principles;
5. Law No. 4 of 1982 regarding Basic Provisions for Living Environment Management;
6. Law No. 11 of 1990 regarding Local Government Structure of Jakarta as State Capital of Government of Republic of Indonesia;
7. Government Regulation No. 20 of 1990 regarding Wastewater Control;
8. Minister of Health Regulation No. 173/Menkes/Per/VIII/1977 regarding Water Pollution Control from Water Body for Various Uses Relating to Health;
9. Minister of Health Regulation No. 528/Menkes/Per/XII/1982 regarding Groundwater Quality Relating to Health;
10. Minister of Trade Decree No. 134/M/SK/4/1988 regarding Prevention and Protection as consequences of industry activities affecting living environment;
11. Minister of Population and Living Environment Decree No. KEP-03/Men.KLH/VI/1993 regarding Wastewater Quality Standard;
12. State Minister of Living Environment No. KEP-51/MENLH/10/1995 regarding Wastewater Quality Standard for Industry Activity;
13. State Minister of Living Environment No. KEP-52/MENLH/10/1995 regarding Wastewater Quality Standard for Hotel;
14. The Greater Jakarta Government Regulation No. 12 of 1971 regarding Air, Water, and Off-Shore Pollution Prevention in the Greater Jakarta Area;
15. The Greater Jakarta Government Regulation No. 5 of 1988 regarding Environment Hygiene in the Greater Jakarta Area;
16. The Greater Jakarta Government Regulation No. 10 of 1991 regarding Greater Jakarta Government Owned Wastewater Management Estate;

17. The Greater Jakarta Government Decree No. 1893 of 1991 regarding Administrative Penalty to Estate/Industry/Activity Generating Environment Pollution in the Greater Jakarta Area;
18. The Greater Jakarta Government Decree No. 1002 of 1985 regarding Environment Pollution Control Coordination and Mechanism in the Greater Jakarta Area;
19. The Greater Jakarta Government Decree No. 582 of 1995 regarding River Water/Water Body Quality Standard and Wastewater Quality Standard in the Greater Jakarta Area;
20. The Greater Jakarta Government Decree No. 211 of 1995 regarding Tariff Establishment for Wastewater Service in the Greater Jakarta Area.

enacts

to establish: THE GREATER JAKARTA GOVERNOR DECREE NO. 1040 OF 1997 REGARDING STANDARD QUALITY OF SEWERAGE WASTEWATER IN THE GREATER JAKARTA

CHAPTER I
GENERAL CONDITIONS

Article 1

Unless the context otherwise requires, the following terms whenever used in this Decree have the following meanings:

a. *Governor* means Governor for the Greater Jakarta Government;
b. *Local Government Owned Wastewater Management Estate* hereinafter called PD PAL Jaya means the Greater Jakarta Owned Wastewater Management Estate;
c. *Related Government Services* means institutions that have been authorized to-date to manage wastewater such as among others Public Works Service, KKPL (Kantor Pengkajian Perkotaan dan Lingkungan – City and Environment Study Office), City Cleanliness Service, and others;
d. *Public wastewater pipe system* means wastewater pipe network as managed by PD PAL Jaya;
e. *Wastewater* means all disposed wastewater from industry activity residue and others that can not be used anymore;
f. *Pipe system wastewater* means all disposed wastewater that enter into the public wastewater pipe system and comply with Quality Standard for Pipe System Wastewater in the Greater Jakarta area;
g. *Domestic wastewater* means activity water residue from household, office, hotel, restaurant, religious service site, entertainment site, market, shopping center, and hospital as a consequence of human activities at such places;
h. *Non domestic wastewater* means disposed water from industry activity residue as a consequence of production process;
i. *Wastewater structure* means physical structures as designated for wastewater management such as among others wastewater pipeline canal, supporting buildings, and wastewater treatment structures;
j. *Parcel wastewater pipe* means outlet pipes (from buildings to the public wastewater pipe system) that are constructed by owners/inhabitants/responsibility bearers of the buildings for closed-channeling wastewater;
k. *Implementer* means Business Institutions or Individuals that operate in service provision and building construction;

CHAPTER II
ENNECTION OF QUALITY STANDARD FOR PIPELINE SYSTEM WASTEWATER

Article 2

(1) The Quality Standard for Pipeline System Wastewater in the Greater Jakarta area is attached to this Decree.
(2) The Quality Standard for Pipeline System Wastewater displays the maximum wastewater quality standard as permitted to be disposed into the public wastewater pipeline system.

Article 3
The Quality Standard for Pipeline System Wastewater as stipulated under Article 2 above serves as an integral part of the water pollution control program in the Greater Jakarta area.

Article 4
Parameter to be tested to each type of activity shall refer to the parameter type as stipulated under the Greater Jakarta Governor Decree that enacts River Water/Water Body Quality Standard and Wastewater Quality Standard in the Greater Jakarta Area.

CHAPTER III
CONTROL

Article 5
Each owners/inhabitants/responsibility bearers of the buildings as located within the service area of installed public wastewater pipeline canals shall dispose their wastewater into such public wastewater pipeline canals.

Article 6
Each owners/inhabitants/responsibility bearers of the buildings as stipulated under Article 5 above shall construct parcel wastewater channeling structure and connect properly to the public wastewater pipeline canals under supervision of PD PAL Jaya and related Government Services.

Article 7
Each owners/inhabitants/responsibility bearers of the buildings as stipulated under Articles 5 and 6 above and have been using the public wastewater pipeline canals shall observe the disposed wastewater quality to comply with the pipeline system wastewater quality standard in order to prevent from disturbances to the wastewater canals and other structures.

CHAPTER IV
SUPERVISION AND MONITORING

Article 8
(1) Supervision and Monitoring against the Quality Standard of the Public Pipeline System Wastewater shall be executed by PD PAL Jaya.
(2) In execution of the supervision as stipulated under point (1) above of this Article, PD PAL Jaya shall coordinate with the related government services and report its supervision results to the Greater Jakarta Governor.
(3) The supervision task as stipulated under point (1) above of this Article include inter alia:
    c. monitoring and evaluation of quality standard of wastewater that enter into the pipeline system,
    d. collection and evaluation of data that relate to activities as stipulated under point a. above shall be executed by PD PAL Jaya.
(4) The supervision shall be conducted periodically and any time as required.
(5) If the results of the supervision and monitoring indicate quality standard deviation, the Government service in charge of guidance provision shall, on behalf of the Greater Jakarta Governor, request the owners/inhabitants/responsibility bearers of the buildings concerned to take needed measures and, if required, enforce penalties based on the pertaining provisions.
(6) Provisions on implementation procedure of the supervision and monitoring shall be established separately that include its implementation guidance and technical guidance.

CHAPTER V
PENALTY

Article 10
Violence to provisions as stipulated under this Decree shall bear administrative penalty below:
    a. Fine;

b. Closure of parcel canal to the public wastewater pipeline canals.

CHAPTER VI
CLOSURE

Article 12

(1) Other provisions that are not stipulated yet under this Decree will be established later.
(2) This Decree is effective on the date of signing.

Enacted in Jakarta
On the date of 21 July 1997

The Greater Jakarta Government
Governor,

Signed

Surjadi Soedirja

c.c.:
1. Minister of Home Affairs;
2. Minister of Public Works;
3. Minister of Industry;
4. Minister of Health;
5. State Minister of Population and Living Environment;
6. Management of Parliament of the Greater Jakarta;
7. Vice Governors of the Greater Jakarta;
8. Vice-Heads of Parliament of the Greater Jakarta;
9. Secretary of the Greater Jakarta Government;
10. Secretary Assistants of the Greater Jakarta Government;
11. Head of Development Planning of the Greater Jakarta Government;
12. Inspectorate of the Greater Jakarta Government;
13. Head of the Greater Jakarta Public Works;
14. Mayors of the Greater Jakarta Government;
15. Head of Socio-Politic Directorate of the Greater Jakarta Government;
16. Head of Community and Village Development Office of the Greater Jakarta Government;
17. Heads of Services of the Greater Jakarta Government;
18. Secretary of Parliament of the Greater Jakarta;
19. The Greater Jakarta Government Owned Estates;
20. Heads of Sub-Districts of the Greater Jakarta;
21. Village Heads of the Greater Jakarta;

ttachment to:	The Greater Jakarta Governor Decree
No.:	No. 1040 of 1997
Dated:	21 July 1997

I. Domestic Wastewater Quality Standard Permitted To Enter Into Pipeline System

No	Parameter	Permitted Quality Standard	Unit
I	PHYSICAL		
	Temperature	38	^{O}C
	Dissolved Solid	3000	mg/L
	Suspended Solid	850	mg/L
II	CHEMICAL		
	Ammonium	65	mg-N/L
	Arsenic	1	mg/L
	Iron (Fe)	5	mg/L
	Fluoride	2	mg/L
	Chlorine, Free	5	mg-C12/L
	Chromium, total	1	mg/L
	Chromium hexavalens	1	mg-Cr6/L
	Nitrate	10	mg/L
	Nitrite	1	mg/L
	pH	5 – 9	
	Zinc (Zn)	15	mg/L
	Selenium (Se)	0.05	mg-S/L
	Sulphide	2	mg/L
	Copper (Cu)	1	mg/L
	Manganese (Mn)	2	mg/L
	Phenol	1	mg/L
	Oil and fat	20	mg/L
	Methylene Blue Active Compound	30	mg/L
	Organic Hazard ($KMnO_4$)	550	mg/L
	BOD	400	mg/L
	COD	600	mg/L

II. Non Domestic Wastewater Quality Standard Permitted To Enter Into Pipeline System

No	Parameter	Permitted Quality Standard	Unit
I	PHYSICAL		
	Temperature	38	^{O}C
	Dissolved Solid	3000	mg/L
	Suspended Solid	850	mg/L
II	CHEMICAL		
	Mercury	0.002	mg/L
	Ammonium	65	mg-N/L
	Arsenic	1	mg/L
	Iron (Fe)	5	mg/L
	Fluoride	2	mg/L
	Cadmium (Cd)	0.05	mg/L
	Chromium, free	5	mg-C12/L
	Chromium, total	2	mg/L
	Chromium hexavalens	1	mg-Cr6/L
	Nickel (Ni)	0.1	mg/L
	Nitrate	10	mg/L
	Nitrite	1	mg/L
	pH	5 – 9	
	Zinc (Zn)	15	mg/L
	Selenium (Se)	0.05	mg-S/L
	Sulphide	2	mg/L
	Copper (Cu)	1	mg/L
	Lead (Pb)	0.1	mg/L
	Manganese (Mn)	10	mg/L
	Phenol	1	mg/L
	Oil and fat	20	mg/L
	Methylene Blue Active Compound	30	mg/L
	Cyanide (Cn)	0.1	mg/L
	Organic Hazard ($KMnO_4$)	550	mg/L
	BOD	400	mg/L
	COD	600	mg/L

The Greater Jakarta Government
Governor,
Signed
Surjadi Soedirja

Appendix 9 Tariff of PD PAL Jaya 2016

Penyambungan Pipa Air Limbah / Cost of Connecting Pipe Waste Water

A. Biaya Penyambungan Pipa Dinas sampai dengan Bak Kontrol /IC pada Kategori Pelanggan semua Kelompok yang sudah ada sistem setempat / STP
A. Cost of Connecting Pipe Service to I/C Control Chamber and Customer Groups of local system and STP

GOL	KATEGORI PELANGGAN / Customer	SATUAN	TARIF(Rp.)
I	RUMAH TANGGA/ Household		
1	Rumah Tangga Type A (Daya Listrik / Electric 450 Watt)	Unit	10,000
2	Rumah Tangga Type B (Daya Listrik / Electric 900 Watt)	Unit	10,000
3	Rumah Tangga Type C (Daya Listrik / Electric 1.300 Watt)	Unit	10,000
4	Rumah Tangga Type D (Daya Listrik / Electric ³ 2.200 Watt)	Unit	110,000
II	NIAGA KECIL/Small Commercial		
1	Toko / Shop	Per m² Luas Bangunan / per m^2 Area	1,000
2	Kantor (Bangunan s/d 3 lantai / Office up to Floors	Per m² Luas Bangunan	1,000
3	Gedung Pertemuan / Assembly hall	Per m² Luas Bangunan	1,000
4	Salon	Per m² Luas Bangunan	1,000
5	Restoran Kecil/Rumah Makan / Small restaurant	Per m² Luas Bangunan	1,500
6	Losmen / Inn	Per m² Luas Bangunan	1,500
7	Usaha Pendidikan (Sekolah Swasta/Kursus/Perguruan Tinggi) / School	Per m² Luas Bangunan	1,500
8	Niaga Kecil Lainnya (Termasuk Rusunawa/Rumah Sewa) / Others	Per m² Luas Bangunan	1,500
III	NIAGA BESAR/Large Commercial		
1	Kantor Bangunan Tinggi / High rise building	Per m² Luas Bangunan	1,750
2	Kantor Bangunan Tinggi (Termasuk Restoran/Fitnes) / High rise office with restauran	Per m² Luas Bangunan	1,925
3	Pusat Perbelanjaan/Mall/Super Market/Show Room / Shopping mall	Per m² Luas Bangunan	1,925
4	Hotel Bintang (Star) I, II, III	Per m² Luas Bangunan	1,925
5	Rumah Susun Milik (Rusunami) / Apartment	Per m² Luas Bangunan	1,925
6	Hotel Bintang IV / IV star hotel	Per m² Luas Bangunan	2,625
7	Apartemen/Kondominium	Per m² Luas Bangunan	2,625
8	Tempat Hiburan/Restoran Besar / Large Restauran	Per m² Luas Bangunan	2,800
9	Rumah Sakit Swasta / Private hospital	Per m² Luas Bangunan	2,800
10	Hotel Bintang V / V star hotel	Per m² Luas Bangunan	2,800
11	Niaga Besar Lainnya / Others	Per m² Luas Bangunan	2,800
IV	SOSIAL / Social		
1	Tempat Ibadah / Religious	Per m² Luas Bangunan	550
2	Sekolah Negeri / Public School	Per m² Luas Bangunan	850
3	Puskesmas / Community health center	Per m² Luas Bangunan	1,100
4	Instansi Pemerintah / Government institution	Per m² Luas Bangunan	1,100
5	Lain-lain Lembaga/Instansi / Other institution	Per m² Luas Bangunan	1,100
6	Rumah Sakit Pemerintah / Government hospital	Per m² Luas Bangunan	1,500
7	Klinik/Balai Pengobatan / Clinic	Per m² Luas Bangunan	1,500
8	Bangunan Sosial Lainya / Others	Per m² Luas Bangunan	1,500
V	INDUSTRI / Industry		
1	Kecil / Small	Per m² Luas Bangunan	1,100
2	Menengah / Medium	Per m² Luas Bangunan	4,200
3	Besar/ Large	Per m² Luas Bangunan	4,300

B. Biaya Penyambungan Pipa Dinas sampai dengan Bak Kontrol I/C pada Kategori pelanggan Kelompok IV yang belum ada sistem setempat/STP
B. Cost of Connecting Pipe Service to I/C Control Chamber and Customers Group IV of no local system/STP

GOL	KATEGORI PELANGGAN	SATUAN	TARIF(Rp.)
III	NIAGA BESAR / Large Commercial		
1	Kantor Bangunan Tinggi / High rise building	Per m² Luas Bangunan	3,500
2	Kantor Bangunan Tinggi (Termasuk Restoran/Fitnes) / High rise office with restauran	Per m² Luas Bangunan	3,850
3	Pusat Perbelanjaan/Mall/Super Market/Show Room / Shopping mall	Per m² Luas Bangunan	3,850
4	Hotel Bintang (Star) I, II, III	Per m² Luas Bangunan	3,850
5	Rumah Susun Milik (Rusunami) / Apartment	Per m² Luas Bangunan	3,850
6	Hotel Bintang IV / IV star hotel	Per m² Luas Bangunan	5,250
7	Apartemen/Kondominium	Per m² Luas Bangunan	5,250
8	Tempat Hiburan/Restoran Besar / Large Restauran	Per m² Luas Bangunan	5,600
9	Rumah Sakit Swasta / Private hospital	Per m² Luas Bangunan	5,600
10	Hotel Bintang V / V star hotel	Per m² Luas Bangunan	5,600
11	Niaga Besar Lainnya / Others	Per m² Luas Bangunan	5,600

Tarif Jasa Pelayanan Pembuangan Air Limbah
The Rate of Wastewater Disposal Services

GOL	KATEGORI PELANGGAN	TARIF(Rp.)
I	RUMAH TANGGA / Household	
1	Rumah Tangga Type A (Daya Listrik / Electric 450 Watt)	131
2	Rumah Tangga Type B (Daya Listrik / Electric 900 Watt)	184
3	Rumah Tangga Type C (Daya Listrik / Electric 1.300 Watt)	236
4	Rumah Tangga Type D (Daya Listrik / Electric ³ 2.200 Watt)	289
II	NIAGA KECIL / Small Scale Commercial	
1	Toko / Shop	525
2	Kantor (Bangunan s/d 3 lantai / Office up to Floors	525
3	Gedung Pertemuan / Assembly hall	525
4	Salon	525
5	Restoran Kecil/Rumah Makan / Small restaurant	525
6	Losmen / Inn	525
7	Usaha Pendidikan (Sekolah Swasta/Kursus/Perguruan Tinggi) / School	525
8	Niaga Kecil Lainnya (Termasuk Rusunawa/Rumah Sewa) / Others	525
III	NIAGA BESAR / Large Scale Commercial	
1	Kantor Bangunan Tinggi / High rise building	578
2	Kantor Bangunan Tinggi (Termasuk Restoran/Fitnes) / High rise office with restauran	604
3	Pusat Perbelanjaan/Mall/Super Market/Show Room / Shopping mall	604
4	Hotel Bintang (Star) I, II, III	604
5	Rumah Susun Milik (Rusunami) / Apartment	604
6	Hotel Bintang IV / IV star hotel	714
7	Apartemen/Kondominium	714
8	Tempat Hiburan/Restoran Besar / Large Restauran	840
9	Rumah Sakit Swasta / Private hospital	840
10	Hotel Bintang V / V star hotel	840
11	Niaga Besar Lainnya / Others	840
IV	SOSIAL / Social	
1	Tempat Ibadah / Religious	53
2	Sekolah Negeri / Public School	263
3	Puskesmas / Community health center	263
4	Instansi Pemerintah / Government institution	315

GOL	KATEGORI PELANGGAN	TARIF(Rp.)
5	Lain-lain Lembaga/Instansi / Other institution	315
6	Rumah Sakit Pemerintah / Governement hospital	315
7	Klinik/Balai Pengobatan / Clinic	315
8	Bangunan Sosial Lainya / Others	315
V	INDUSTRI / Industry	
1	Kecil / Small	548
2	Menengah / Medium	630
3	Besar / Large	788

Layanan Lumpur Tinja Terjadwal (LLTT)
Fecal Sludge Scheduled Service

No	KATEGORI PELANGGAN / Costumer	BIAYA (TERMASUK PPN / include Tax 10%)	KET
1	Pendaftaran Pelanggan Pertama /Registration fee	Rp. 330,000,-	
2	Tarif Bulanan / Monthly Tariff	Rp. 16,500,-	

Tarif Pemeriksaan Laboratorium
The Rate of Laboratory Examination

No	PARAMETER	HARGA SATUAN (Rp.)
1	pH	22,500
2	Organik ($KMnO_4$)	22,500
3	Zat Padat Tersuspensi / Suspended solid	22,500
4	Amonia	26,250
5	Minyak dan Lemak / Oil and Fat	135,000
6	Senyawa Aktif Biru Metilen (Detergen) / Methylene Blue Active Compounds	90,000
7	COD (Dichromat)	52,500
8	BOD 20° C, 5 hari	52,500

Appendix-10 Local Regulation of Sewerage Works, Denpasar

1. Questionee and Date

May 27, 2016 11:00- Mr. Uehara Project Manager, Denpasar Sewerage Development Project （II）（DSDP-II）
May 27, 2016 14:00- Ir. Wayan Budiarsa Dipl. SE. Head of Satker Pengembangan Sistem Penyehatan Lingkungan Permukiman Provinsi Bali (Project Office of CIPTA KARYA, DPUR)
May 28, 2016 16:00- Mr. Uehara Project Manager, Denpasar Sewerage Development Project （II）（DSDP-II）Site Visit

2. Local Regulations of Sewerage Works, Denpasar

(1) Local Regulation of Sewerage Works

- Decree of Sewerage Works, which stipulates a series of sewerage administration, is not promulgated in Bali Province.
- Ir. Wayan stresses regulations below, which are promulgated by Bali Provincial Government in advance of National Wastewater Management Law, implement and operate sewerage works.
  - (i) PERATURAN GUBERNUR BALI NOMOR 8 TAHUN 2007 TENTANG BAKU MUTU LINGKUNGAN HIDUP DAN KRITERIA BAKU KERUSAKAN LINGKUNGAN HIDUP, which stipulates the environmental standards on water quality, noise, ambient air and others.
  - (ii) PERATURAN DAERAH PROVINSI BALI NOMOR 2 TAHUN 2011 TENTANG RETRIBUSI JASA UMUM, which stipulates the sewerage tariff.
  - (iii) KEPUTUSAN GUBERNUR BALI NOMOR 663/01-F/HK/2016 TENTANG PENERAPAN BADAN LAYANAN UMUM DEAERAH UPT. PENGELOLAAN AIR LIMBAH DINAS PEKERJAAN UMUM PROVINSI BALI, which stipulates the project implementation unit of BLUD “Badan Layanan Umum Daerah (Public Service Agency)” on UPT-PAL (Division of wastewater management, Department of Public Works, Bali Provincial Government).

(2) Obligation of House Connection on Household

- Expense of house connection of household is financed by Provincial Government and City Government in accordance with Agreement of National Government, Bali Provincial Government and Municipal Governments on Denpasar Sewerage Development Project (DSDP-I and DSDP-II). Accordingly, House connection of household will be financed on and after completion of ODA Project. Individual household does not conscious of obligation on house connection.
- Expense of house connection of commercial building is financed by property owner.
- Ir. Wayan stresses sewerage works will fail in house connection if connection charge is levied to household.
- Whole municipalities in Central Jawa, where Ir. Wayan worked for project manager, provide expense of house connection. Bandung City exceptionally levies house connection charge, however residents may file a lawsuit.

(3) Obligation of Pre-treatment Facility of Industrial Wastewater Discharge

- Ir. Wayan recognizes Decree on “Industrial wastewater quality standard to discharge to public sewer” can be alternated by Governor Decree No.8 2007, which stipulates the environmental standards on water quality, noise, ambient air and others. Accordingly, this subject (3) is not mutually understood.
- JICA Study Team supposes that industrial wastewater is prohibited to discharge to public sewer and Decree No.8 2007 which stipulates to discharge wastewater into environment.

(4) Sewerage Tariff

- Levy on sewerage tariff is stipulated by Governor Decree No.2 2011 and tariff level is low

rate, accordingly sewerage tariff can be affordable to household.

- Cross subsidy tariff structure, which subsidizes to residents from commercial and high income, is important.
- Ir. Wayan stresses the merit of cross subsidy which provides sewerage service financially, and has reviewed the policy of CIPTA KARYA which focuses sanitation service of poverty resident.
- Cross subsidy tariff structure varies in conditions of municipalities. Bali Province applies tariff groups classified by width of road which individual house faces.

(5) Issues on Sewerage in Denpasar at Present

Ir. Wayan stresses public awareness or socialization as most important issue following.

- To reduce traffic suspension due to sewer construction.
- To apply clean construction technology
- To improve wastewater discharge manner of residents such as disposing garbage in order to prevent clogging of service pipe and discharging storm water in to sanitary sewer at inundation.

Sewerage Tariff of Bali Province

No.	Customer Classification	Rp./Month
I.	Social piping	
	-Social Foundation, Orphanage, School	10,000
II.	Households	
	Type A -Housing in the face there is a road that widens included berm drains and channels under 7 m	15,000
	Type B -Housing in the face there is a road that widens included berm drains and channels 7-10 m	20,000
	Type C -Housing in the face there is a road that widens included berm drains and channels above 10 m	25,000
III.	Agency / Office	70,000
IV.	Hotel	
	1. Star (Rates calculated for each room)	100,000
	2. Non Star (Rates calculated for each room)	50,000
	3. Lodging / Inns	150,000
V.	Restaurant / diner	
	1. have a maximum of 50 seats	400,000.00
	2. have a seat between 50 to 100 seats	500,000.00
	3. have a seat in the top 100 seats	700,000.00
VI.	Commercial/Commerce	
	1. Small (Small Business License)	45,000
	2. Medium (Medium Scale Business License)	100,000
	3.Large (Large Scale Business License)	150,000
VII.	Public facilities	40,000
B.	Non Piping	
	1. Drain Services Septic Tank with Sludge Trucks per m^3	150,000
	2. Fee to be charged to the drain service truck which throws Domestic Waste in WWTP per m^3	25,000

Sewerage Tariff of Bali Province

No.	Customer Classification	Rp./Month
I.	Social piping	
	-Social Foundation, Orphanage, School	10,000
II.	Households	
	Type A -Housing in the face there is a road that widens included berm drains and channels under 7 m	15,000
	Type B -Housing in the face there is a road that widens included berm drains and channels 7-10 m	20,000
	Type C -Housing in the face there is a road that widens included berm drains and channels above 10 m	25,000
III.	Agency / Office	70,000
IV.	Hotel	
	1. Star (Rates calculated for each room)	100,000
	2. Non Star (Rates calculated for each room)	50,000
	3. Lodging / Inns	150,000
V.	Restaurant / diner	
	1. have a maximum of 50 seats	400,000.00
	2. have a seat between 50 to 100 seats	500,000.00
	3. have a seat in the top 100 seats	700,000.00
VI.	Commercial/Commerce	
	1. Small (Small Business License)	45,000
	2. Medium (Medium Scale Business License)	100,000
	3.Large (Large Scale Business License)	150,000
VII.	Public facilities	40,000
B.	Non Piping	
	1. Drain Services Septic Tank with Sludge Trucks per m^3	150,000
	2. Fee to be charged to the drain service truck which throws Domestic Waste in WWTP per m^3	25,000