“ CHLORINE NEXT ”

Metropolitan Waterworks Authority

การประปานครหลวง
METROPOLITAN WATERWORKS AUTHORITY

ANDROID APP ON Google play

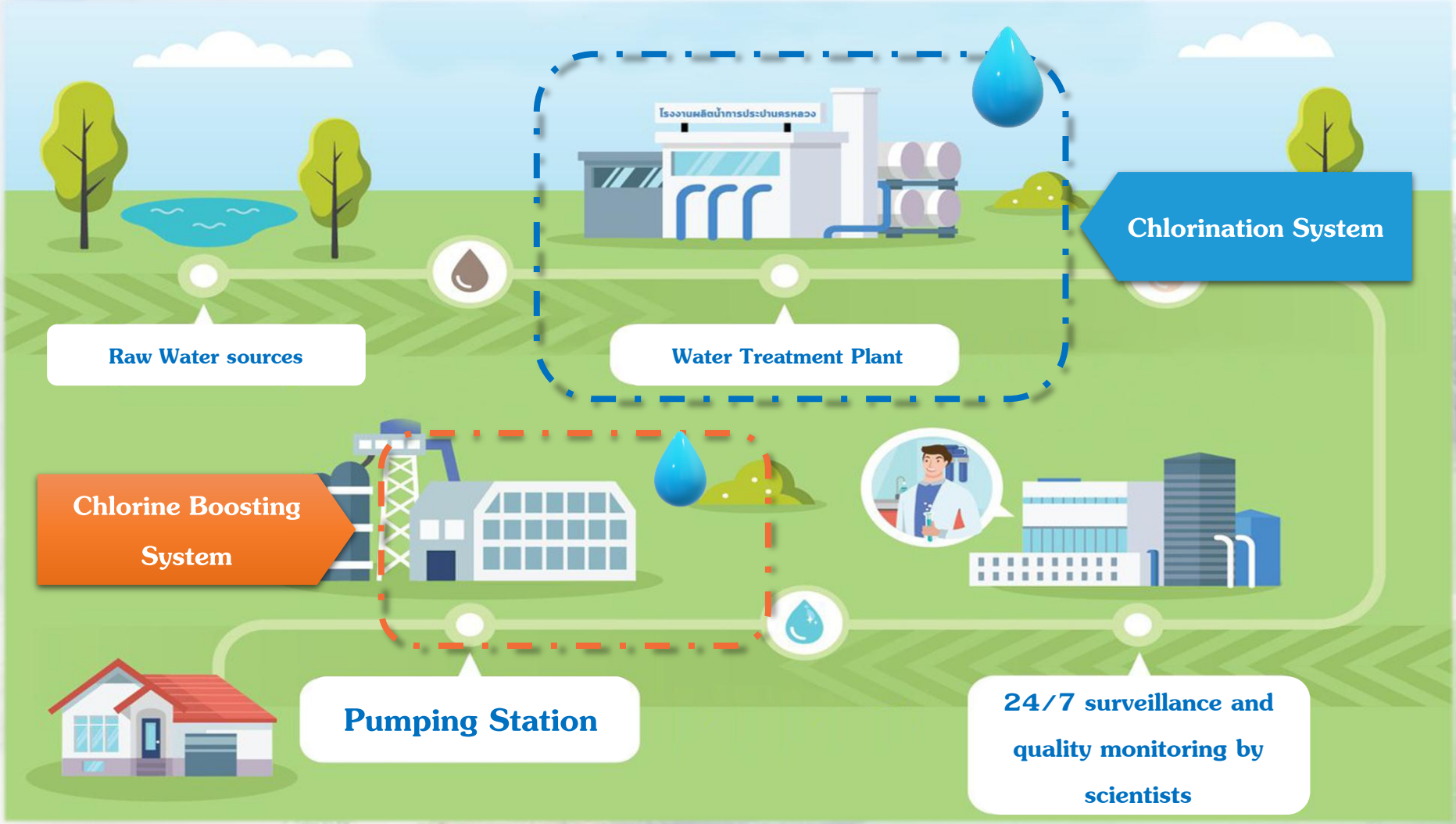
Available on the App Store

Metropolitan Waterworks Authority

การประปานครหลวง
METROPOLITAN WATERWORKS AUTHORITY

Metropolitan Waterworks Authority ,Thailand (MWA) is a State enterprise under Ministry of Interior, established since August 16 , 1967. By Metropolitan Waterworks Authority act., MWA is responsible for providing and producing water supply in Bangkok, Nonthaburi, and Samutprakan provinces

- Responsible Area : 3,195 km^2
- Serviced Area : 2,450 km^2 (76.7%)
- Population : 12 million
- Production Capacity : 6 million CMD


Raw Water sources
Water Treatment Plant
Chlorination System
Chlorine Boosting System
Pumping Station
24/7 surveillance and quality monitoring by scientists

Chlorine Boosting at 9 Pumping Stations

Via SCADA System

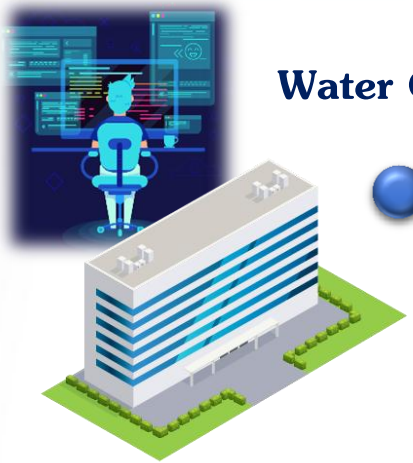
Control At pumping stations : 0.5 - 1.2 mg./L

At users end : 0.2 mg./L (WHO guideline for drinking water)

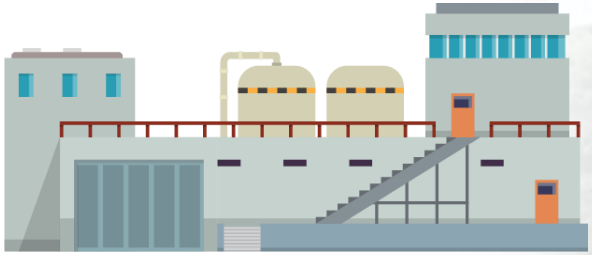
10.00 AM

2.00 PM

8.00 PM

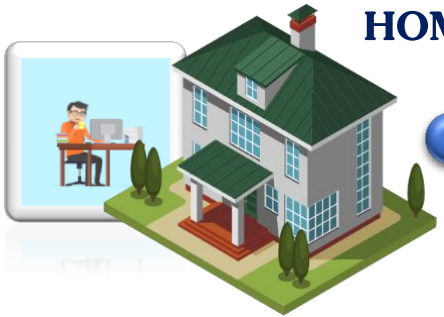


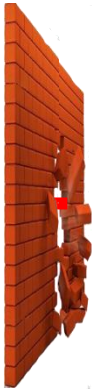
Water Quality Integrated Center



9 Pumping Stations

HOME





adjustments according to time period

cannot supply chlorine afterhours as well as when the raw water quality is poor.

Water quality is not up to the criteria

May be contaminated

Chlorine Boosting procedure

STEP 01

Predict the water quality from Water Treatment Plant

STEP 02

Calculate the chlorine dosage rate

OC น้ำดิบ (mg/L)	% การลดปริมาณ free Res. Cl_2					
	ระยะสัญญาณ 2 (TR 2)			ระยะสัญญาณ 3 (TR 3)		
	ค่าเฉลี่ย	ค่าสูงสุด	ค่าต่ำสุด	ค่าเฉลี่ย	ค่าสูงสุด	ค่าต่ำสุด
20-30	30	25	30	40	35	60
31-55	45	50	50	65	50	70
56-70	60	55	60	70	55	75

$$\frac{Litre}{Hour}\ NaOCl\ used = \frac{Inlet Flow\left(\frac{m^3}{hr}\right) \times Desired\ NaOCl\ dose\left(\frac{mg}{l}\right)}{Specific\ Gravity\ of\ NaOCl\left(\frac{kg}{l}\right) \times NaOCl\ Concentration(\%)} \times 3$$

STEP 03

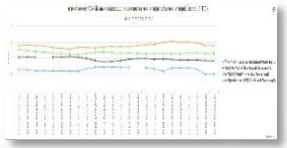
Adjust the chlorine dosage at the pumping station.

STEP 04

Adjustment report

STEP 05

Check adjustment performance



Objectives

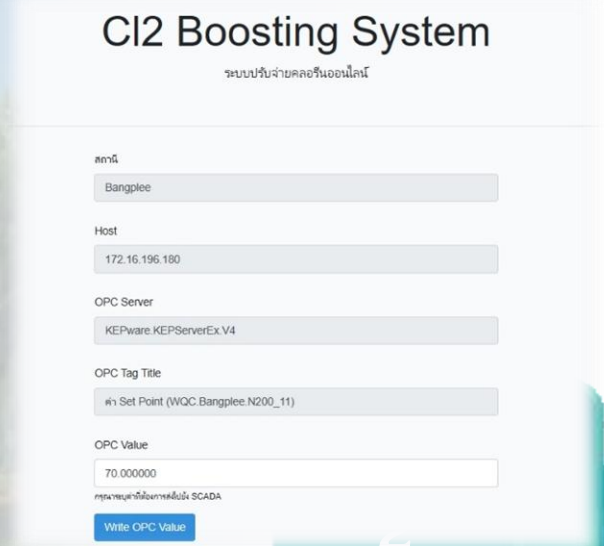
01

To control free residual chlorine at the reference points.

02

To bring technology to increase the efficiency of chlorine boosting management.

Improvement Steps



- Any Where
- Any Time

- Many Step
- Inconvenient

Mobile Application

STEP 1

Web application “Cl2 Boosting System”

Development Period

OCT-DEC 18	Jan 19	Feb 19	Feb-Mar 19	Mar 19	May 19
Analyze problem and user requirement	- Assess the readiness of the networking and security of MWA. - System design	System Development	Install and Test the system	Improvements and fixes for system defects	Implementation

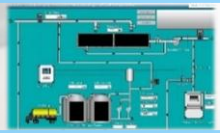
Innovation Development Plan & Possibilities

Departments Information

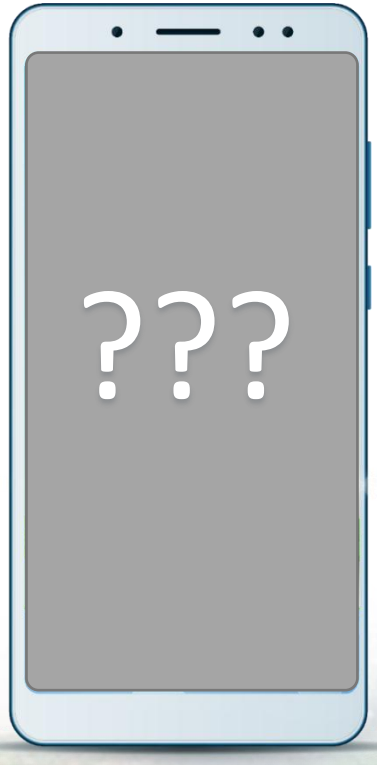
Real Time Water Quality Information

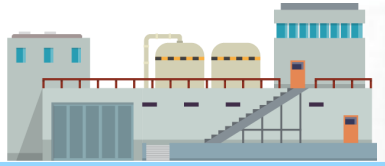
Chlorine Plus

(Free Residual Chlorine forecasting web application)

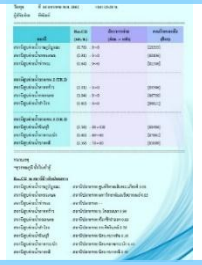


Chlorine Boosting System





Chlorine Boosting at Pumping Stations

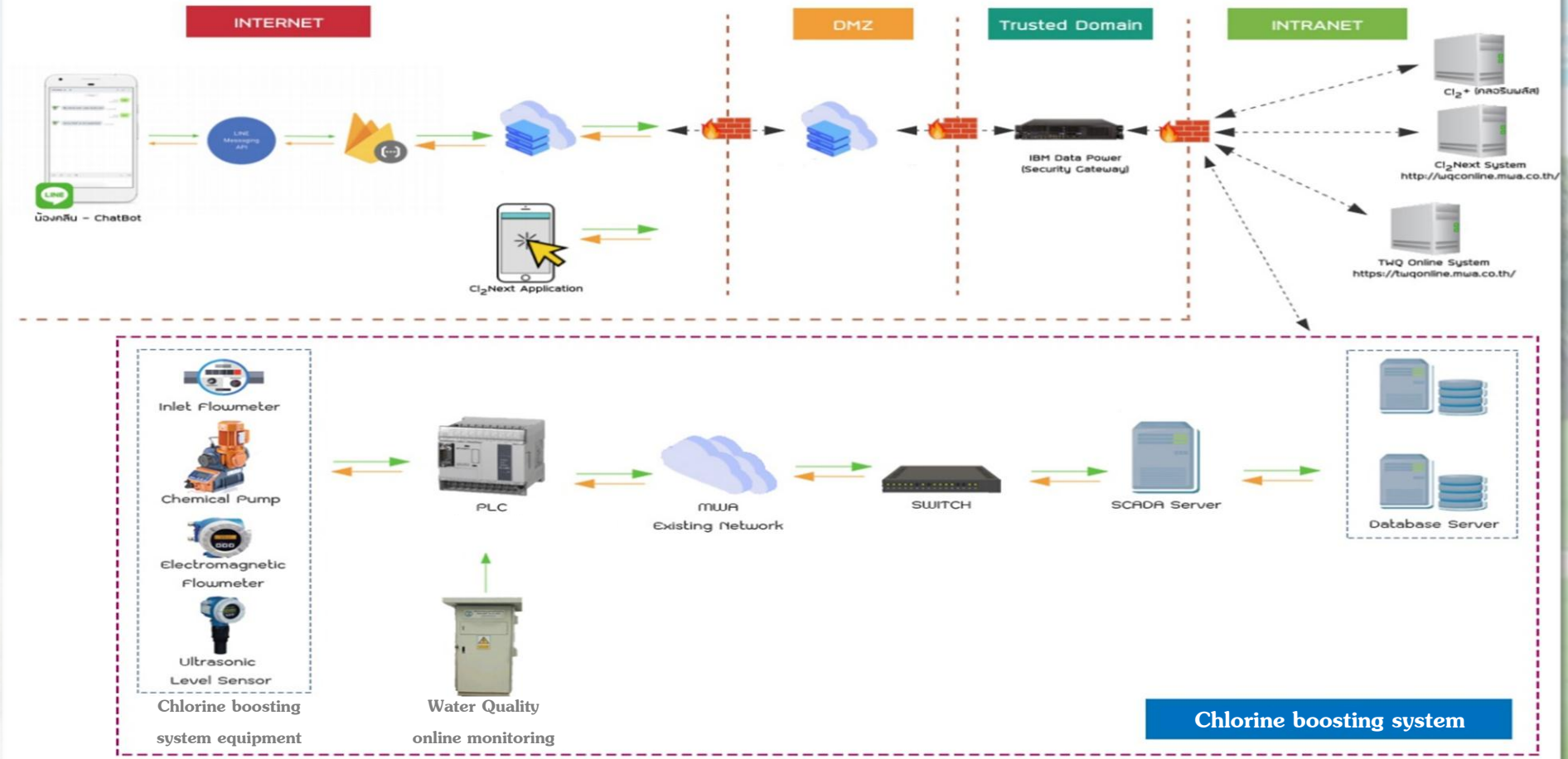


Chlorine Boosting Report

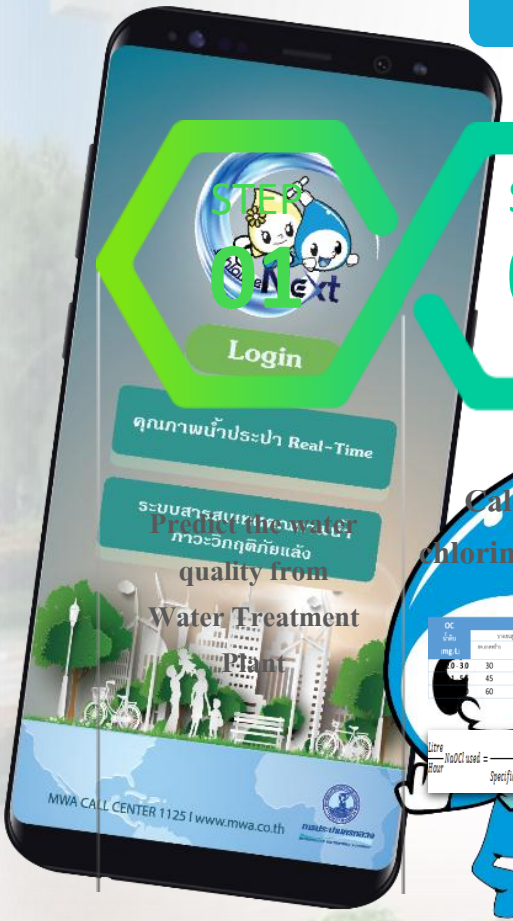
Water Quality Report

สถาปัตยกรรมระบบ Cl2Next :

Cl_2Next – System Architecture :



Chlorine Next

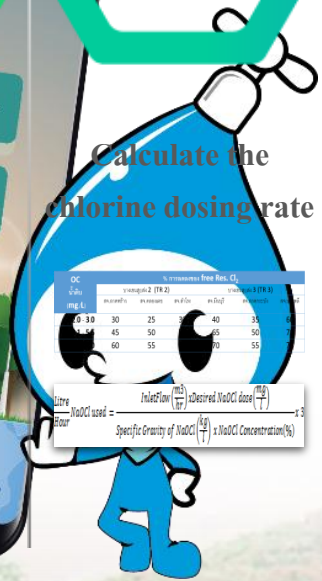


STEP 01

Predict the water quality from Water Treatment Plant

STEP 02

Calculate the chlorine dosing rate

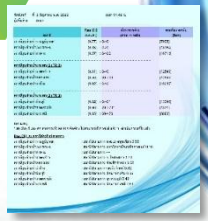


STEP 03

Adjust the chlorine dosing at the pumping station

STEP 04

Adjustment report

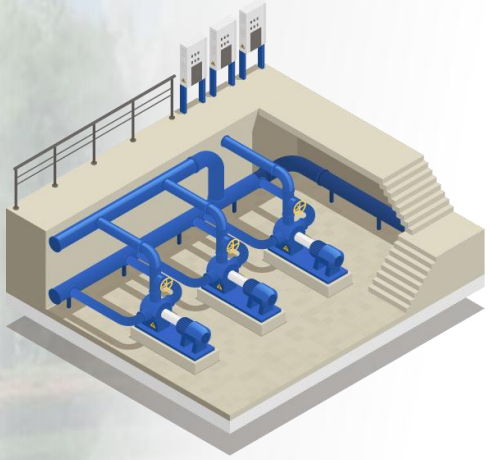


STEP 05

Check adjustment performance

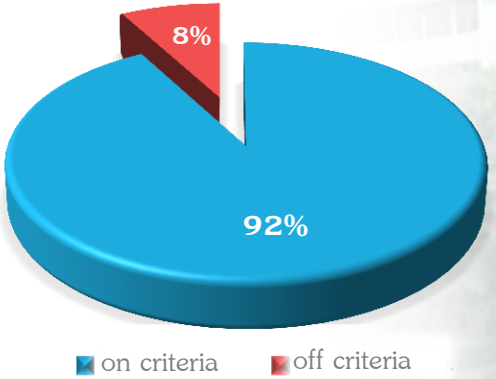
Free Residual Chlorine Percentage at Bang Phli Pumping Station ≥ 0.5 mg/l

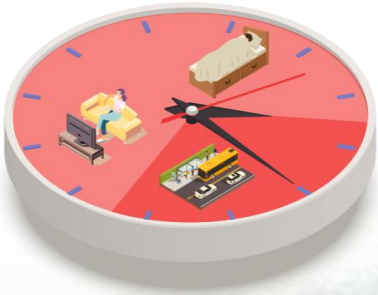
(Control Criteria at Pumping Station)



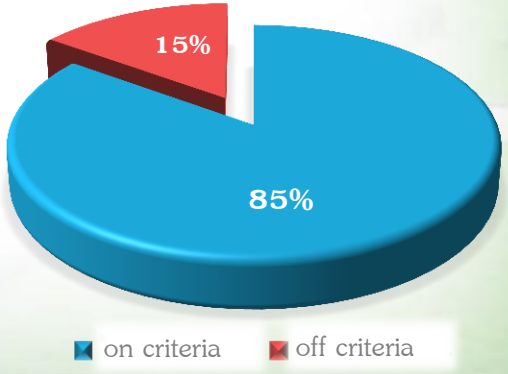
Pumping Stations

On Duty (8.30 AM – 4.30 PM)



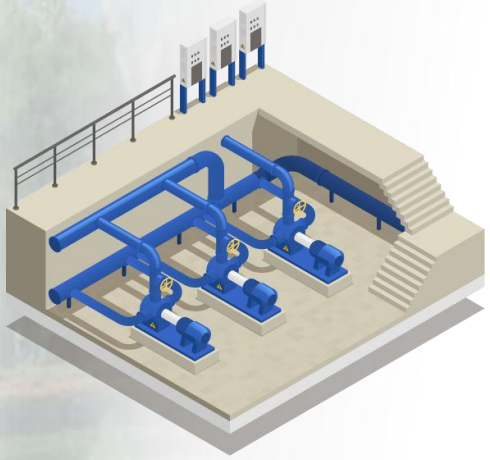


Off Duty (4.30 PM – 8.30 AM)



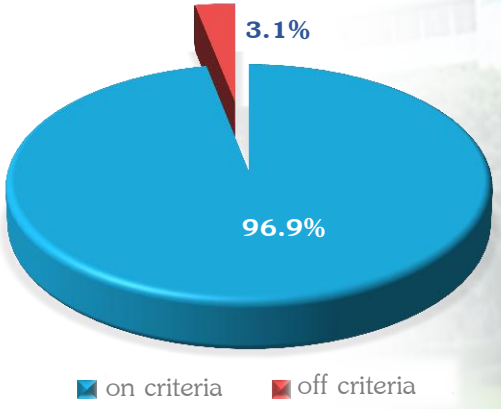
Free Residual Chlorine Percentage at Bang Phli Pumping Station ≥ 0.5 mg/l

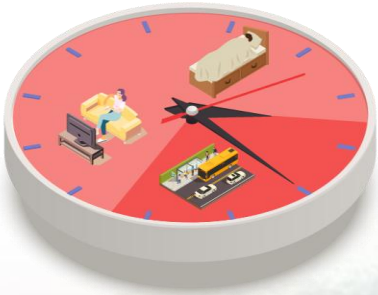
(Control Criteria at Pumping Station)



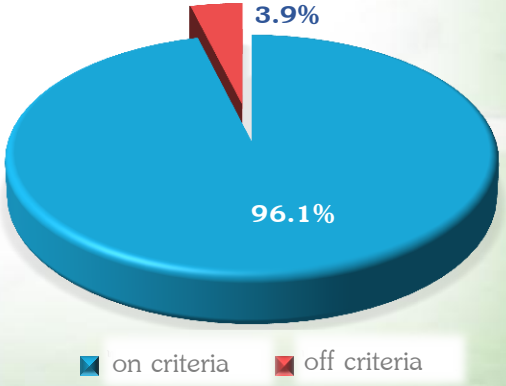
Pumping Stations

On Duty (8.30 AM – 4.30 PM)



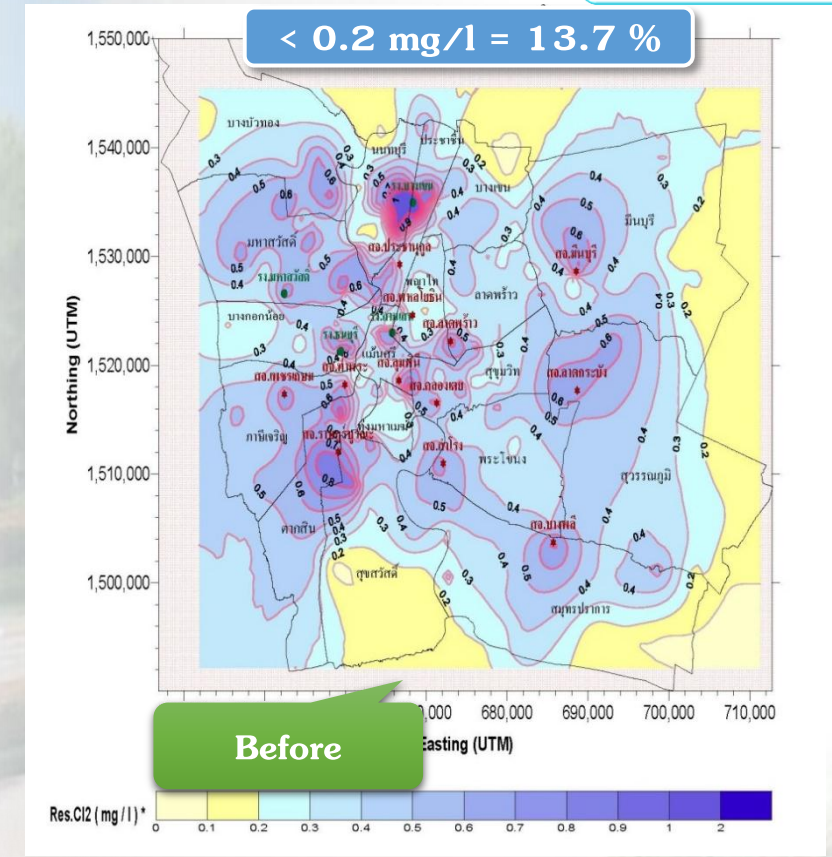


Off Duty (4.30 PM – 8.30 AM)



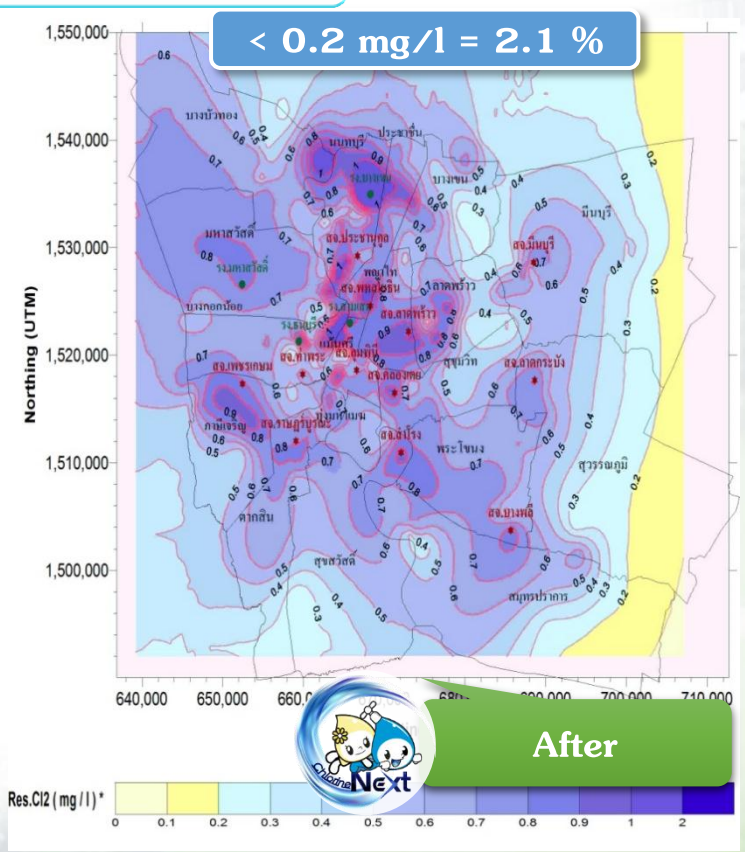
Chlorine Contours

< 0.2 mg/l = 13.7 %



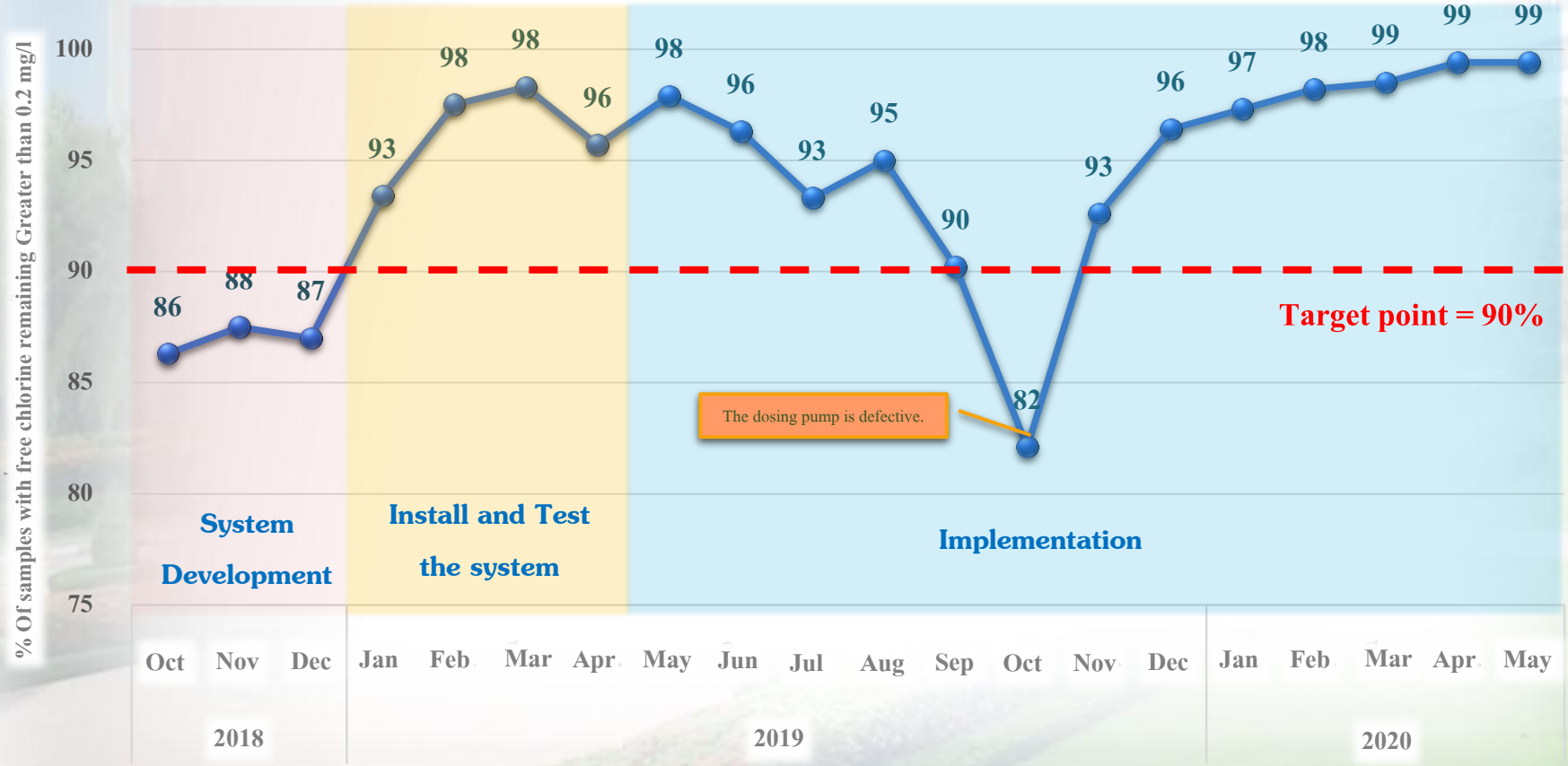
Before

< 0.2 mg/l = 2.1 %



After

% of Samples with Free Chlorine Remaining Greater than 0.2 mg/l (Oct. 2018 - May 2020)



Benefits

Get new innovation to control the free residual chlorine level in the water supply system.

Reduce steps and work time.

Reduce expenses approximately (Over-Time)

1.8 million baht / year

Benefits

Control the chlorine at the end of the line to be in the criteria regularly.

Responding to Water Safety plans of MWA.

Build a good quality of life. People received safe and clean tap water.

World Health Organization

THANK YOU