PROJECT TEAM | ATR

Water Purification Project in Indonesia

ATR

PROJECT **TEAM**

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Project Team ATR

Project Team ATR is an environmental consulting firm that works with public corporations and eco-friendly technology companies to **combat climate change and promote sustainable development** since 2020. We specialize in consulting for all processes (development, registration, monitoring, etc.) related to the offset project and strive to discover eco-friendly technology companies to cooperate with on these processes.

Projects

Offset Project Development & Consulting

ATR actively responds to international carbon market trends

1) ATR provides **consulting on the entire process of the overseas offset project** (development, registration, and monitoring etc.)

2) Guide domestic companies on emission reduction technology so they can respond to the K-ETS (Korean Emission Trade System). We provide integrated consulting such as policy response and the development of emission reduction projects.

3) We strive for a cleaner environment through various national R&D projects such as climate adaptation and climate change response strategies.

Business Partners

LH KOREA LAND & HOUSING CORPORATION

KOREA EAST-WEST POWER CO.,LTD.

SBB

IAE Institute for Advanced Engineering

SYNOPEX

Business Partner - **Synopex**

SYNOPEX

Synopex has been **researching and developing high-performance filters for decades and has expanded investments in the water business** to prepare for an impending water shortage crisis in the future. From simple water treatment facilities that have difficulty supplying household water at the regional level to global issues, such as advanced water treatment fields in seawater desalination, **Synopex is leaping forward by securing unrivalled technology and know-how in all fields of the water business**.

Synopex Business Performance

- ✓ Filter Domestic M/S 1st : Supplying high performance filters for slurry filtration to Samsung Semiconductor
- ✓ Supply filters to domestic slurry manufacturers: KC Tech, Soulbrain, Samsung SDI, Dongjin Semichem, Youngchang Chemical, etc.
- ✓ Taiwan Powerchip Technology Corp.
- ✓ Exported filters to US Global FoundExported POU (point of use) filters to ries

Awards & Patents

[ISO 9001 / 14001]

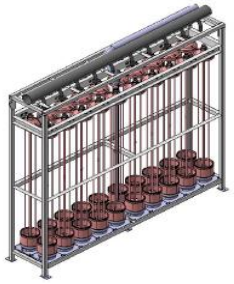
[TS16949]

[Research institute]

[Venture Business]

Products(example)

[G-Brane]



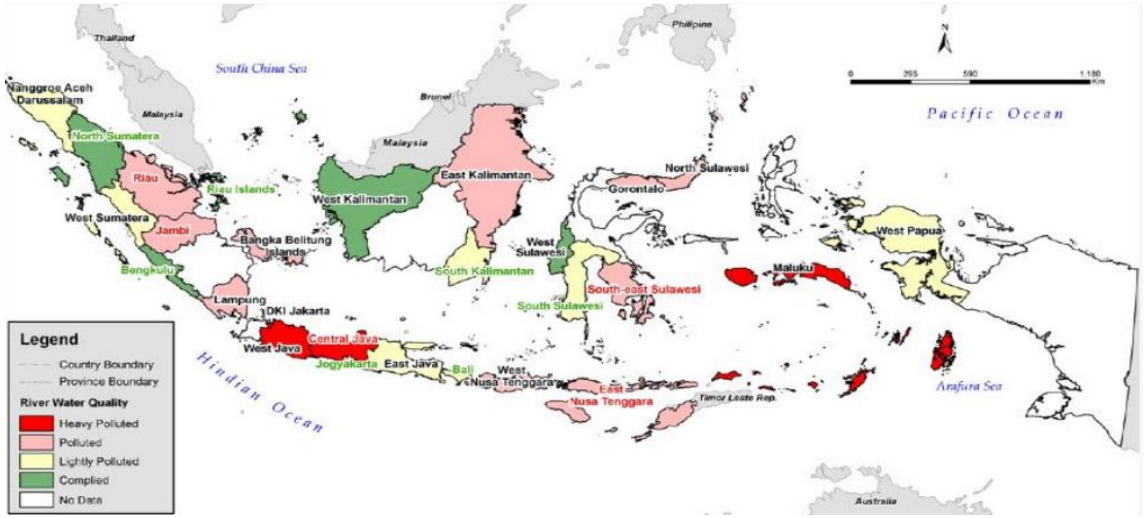
[S-Series]

[GS Membrane]

[NF Membrane]

Water Use in Indonesia

Indonesia possesses **21%** of the total freshwater available in the Asia-Pacific region



2,838 km³

5,590 Rivers

1,035 Lakes

20 Dams

2,042 Reservoir

However, as a result of rapid development, **increased waste,** and a **lack of wastewater treatment** groundwater is being seriously contaminated.

In addition, **high water loss rates** and **aging water treatment facilities** are making water resources in Indonesia even more scarce.

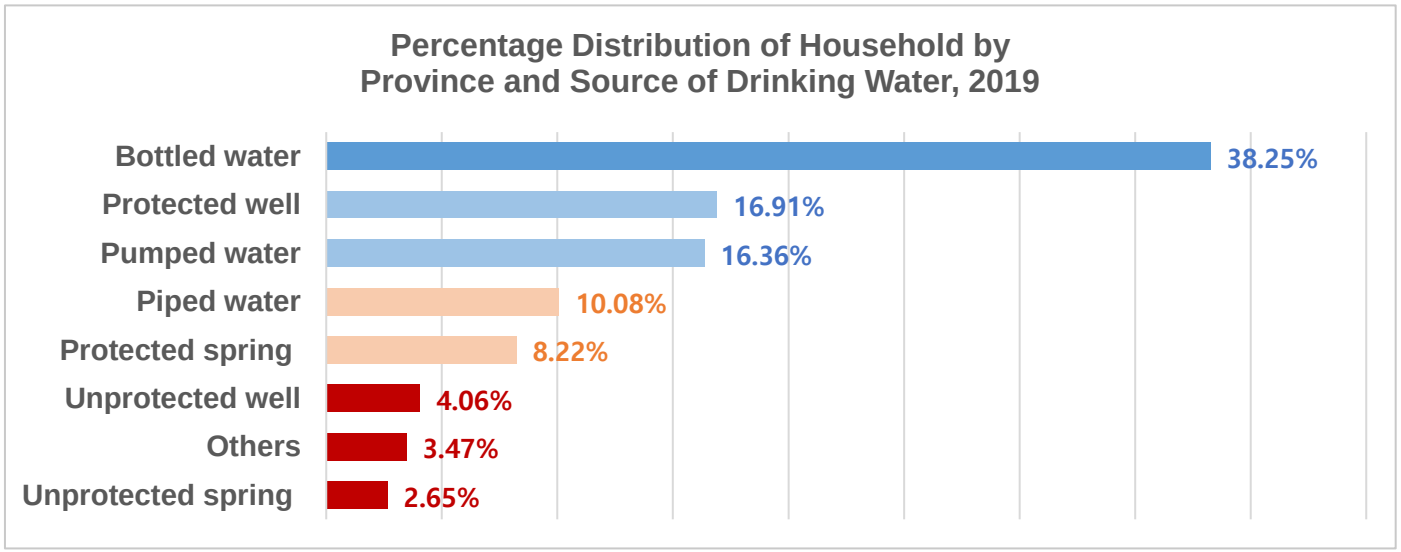
Water Use in Indonesia

Indonesia's drinking water service rate was about 73.68%

(Statistik Indonesia 2020, Badan Pusat Statistik)

"2.7 out of 10 people lack access to drinking water"

Only 10.08% of piped water is used as drinking water, 38% of the population uses bottled water for guaranteed water quality.



People who drink water through water pipes at home usually boil it once before drinking.

The drawbacks of boiling water :

1. Requires **lots of fuel** and cooking equipment
2. The water can still contain **some particles**
3. Boiling water does not eliminate **chemical pollutants and heavy metals**

Project Goal

Water Purification System

Safe drinking water for people

✔ Prevention of waterborne diseases

Using safe and clean drinking water, **waterborne diseases such as cholera, diarrhea, and typhoid fever can be prevented**.

✔ Eco Friendly

By providing safe and clean drinking water, **greenhouse gas emissions can be eliminated** for those boiling water at home.

✔ Job Creation

The project activity will help develop a section of Indonesia's economy through the **installation and maintenance of Water purification systems**, and jobs related to monitoring of the Carbon Reduction Project Activity.

Project Activity Summary & Construction Status

Project Activity Summary

Objective Install water purification systems to provide safe drinking water in Indonesia in areas where there are no public distribution networks providing safe drinking water.

Target Individual households and communities within Indonesia

Technology Projects will be operate as POE (Point of Entry)[1] systems that use a combination of filter types depending on the condition of the local water quality.

Filter type	Main function	Filter system	Replacement cycle
Ultra Filter	Turbidity and microbial removal	Hollow fiber membrane	5 years
Micro Filter	Turbidity and microbial removal	Hollow fiber membrane	5 years
Nano Filter	Chromaticity, Divalent ions, taste, smell removal	Hollow fiber membrane or spiral wound membrane	3 years
Reverse Osmosis Filter	Chromaticity, ions, taste, smell removal	Spiral wound membrane	3 years
Sediment Filter	Relatively large particle removal	Cartridge type (depth filter)	1~5 weeks
Sand Filter	Relatively large particle removal	Gravel, sand	4 years

1) Point of Entry (POE) treatment devices: typically installed to treat all water entering a single homes, businesses, schools, or facilities; vs. Point of Use (POU) devices that treat only the water intended for direct consumption, typically at a single tap or limited number of taps

Project Activity Summary

Project Start Date The start date is set as 2020.11.06, the date the application was submitted to VERRA.

Project Period 28 years

Applied Methodology AMS-III.AV "Low greenhouse gas-emitting safe drinking water production systems" (Ver 08.0)

"This methodology comprises introduction of low greenhouse gas emitting water purification systems to provide safe drinking water (SDW). Water purification technologies that involve point-of use (POU) or point-of-entry (POE)."

Baseline: Households boil water to create SDW



Project: Water is purified via the purification facilities and supplied to homes.


Benefits

Environmental	Reduce green house gas emissions from the use of non-renewable biomass/fossil fuel to boil water
Social	Reduce the purchasing of firewood or fossil fuels, reduce foraging for firewood, reduce polluted indoor air
Economic	Help to develop a section of Indonesia's rural economy through the purification systems

The project expects to contribute an annual average of **0.1-0.2 tCO2 emission reductions per person per Project**

Project Activity Summary

Applied Methodology AMS-III.AV "Low greenhouse gas-emitting safe drinking water production systems" (Ver 08.0)

- ✓ There should be no public distribution network supplying safe drinking water
- ✓ The technology/equipment applied to the project must meet the national drinking water standards via laboratory test results.
- ✓ If the lifespan of the water treatment facility doesn't last until the Project Expiration date, End Users must have access to a water purification system of similar quality.
- ✓ Drinking water supplied by the project must be demonstrated to be microbiologically safe through tests (at least one pathogen and microbial) conducted on samples before and after treatment.

Emissions	About
Baseline Emissions (BE_y)	• GHG emissions prior to the Project Activity • Emissions calculations from fuel (fossil fuels, biomass, etc.) used to boil water • Assume that the emissions are relative to the amount of drinking water produced **BE_y** = Amount of Purified water (L/yr) x SDW ratio (%) x Energy required to boil 1 Liter of water (KJ/L) x Displaced fuel emission factor (tCO_2/TJ) x 10^{-9}
Project Emissions (PE_y)	• Calculation of emissions from fuel used to operate the purification facilities **PE_y** = [Fossil Fuel consumption x Fuel emission factor] + [Power Consumption x Power emission factor]
Emissions Reductions (ER_y)	• GHG emissions reductions from the Project Activity **ER_y** = Baseline Emissions (BE_y) * 0.95[1] – Project Emissions(PE_y)

1) Baseline Emissions will be multiplied by a net to gross adjustment factor of 0.95 to account for leakages.

Project Activity Summary

Emissions Reductions

To determine Emissions Reductions, Project Emissions and Leakage emissions are subtracted from Baseline Emissions

ER_y = Baseline Emissions (BE_y) – Project Emissions (PE_y) – Leakage Emissions (LE_y)*

Emissions	About
Baseline Emissions (BE_y)	• Emissions calculations from fuel (fossil fuels, biomass, etc.) used to boil water • Assume that the emissions are relative to the amount of drinking water produced **BE_y** = Amount of Purified water (L/yr) x SDW ratio (%) x Energy required to boil 1 Liter of water (KJ/L) x Displaced fuel emission factor (tCO_2/TJ) x 10^{-9}
Project Emissions (PE_y)	• Calculation of emissions from fuel used to operate low greenhouse gas emitting water purification facilities **PE_y** = [Fossil Fuel consumption x Fuel emission factor] + [Power Consumption x Power emission factor]
Emissions Reductions (ER_y)	**ER_y** = Baseline Emissions (BE_y) * 0.95 – Project Emissions (PE_y)

Project Activity Summary

Operating Method

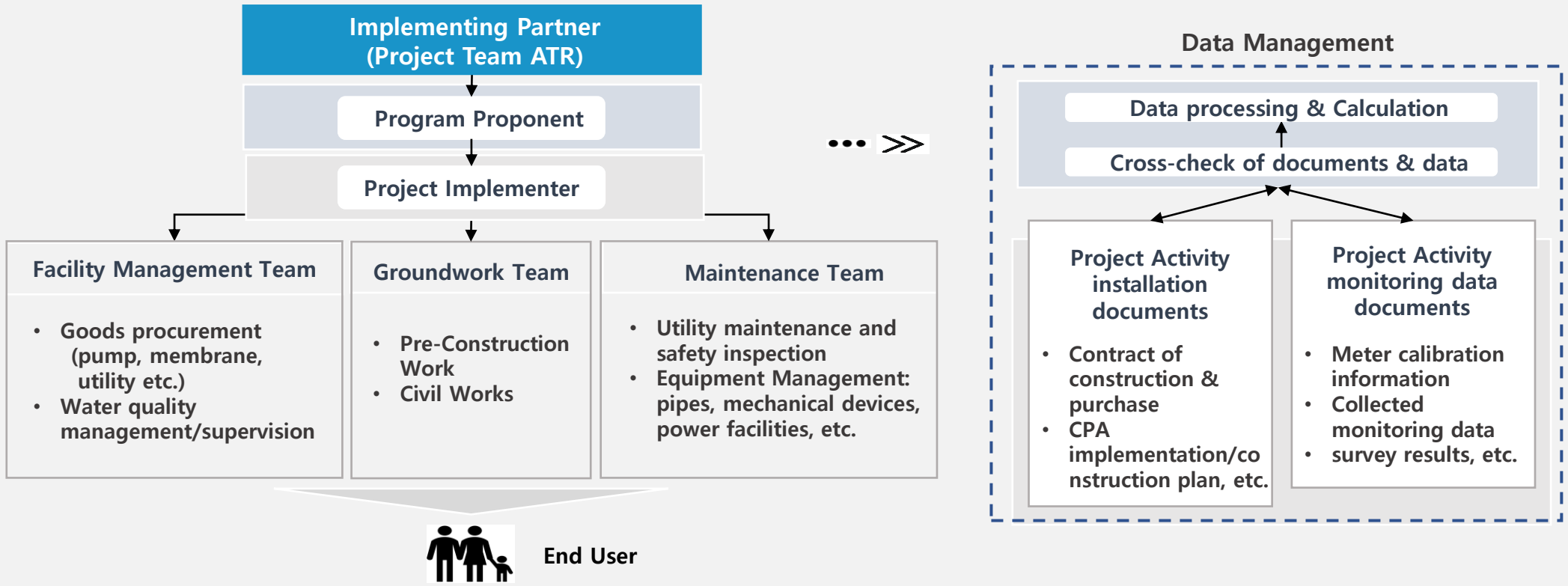
- The drinking water will be provided at a minimum cost that will be determined in advance with the host country.
- The drinking water treatment standards will follow the Indonesian National Standards (Decree of Minister No. 492 of 2010 on drinking water quality) and the standards set by WHO.

Project Participants

Synopex Co.,Ltd.

Project team ATR Co., Ltd.

- Implementing Partner (ATR-PT, Manage Project operations)
- Project Proponent (Synopex, Manage Project Operations)
- Project Implementer (Synopex Indonesia, Manage the Water Purification Plant)



Construction Status of the Purification Plant

History & Plan

2017.03
PT. Synopex Tirta Indonesia Establishment

2018.12
Candidate Company Due Diligence

2019.7
MOU signed

2019.11
Contract signed (BOT)

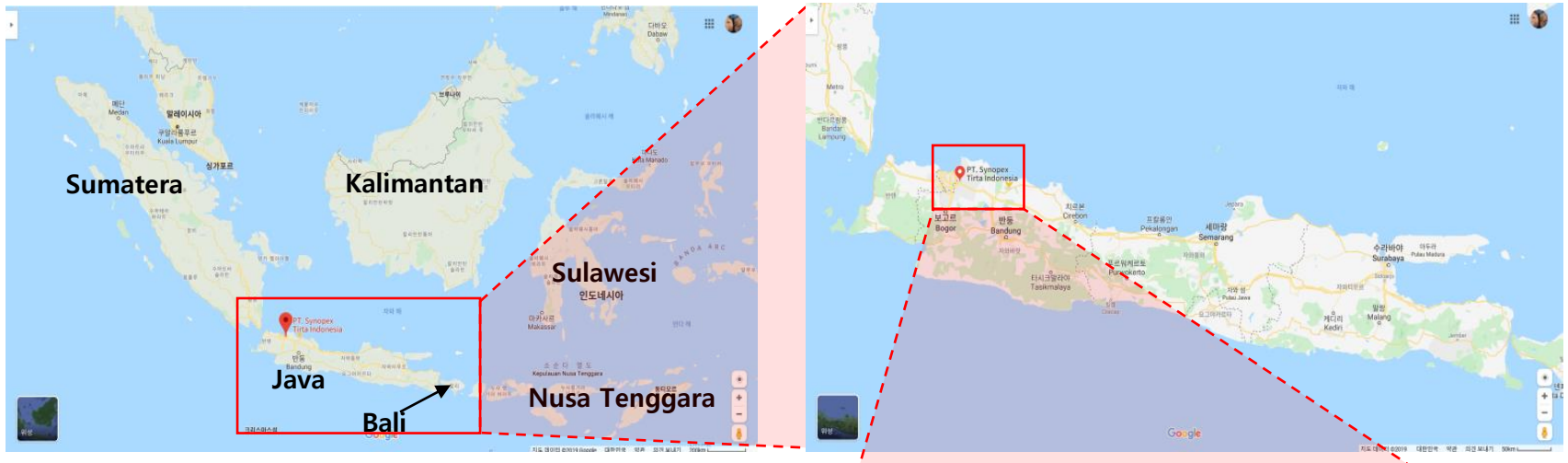
2020.4
Construction start

2021.2
Completion 1st stage(NEW) (3,400 CMD)

2021.5
Completion 2nd stage (Retrofitting, (5,200 CMD)

Construction Status of the Purification Plant

Location Sukamandijaya, Ciasem, Subang Regency, West Java 41256



Distance

Jakarta - STI :
About 20km (about 1 hour by car)

STI - Ciasem WTP :
About 100km (about 3 hours by car)

Construction Status of the Purification Plant

WTP Status

Capacity : 20L/sec x 2ea = 40L/sec, 3,456m^3/day

Coagulation/Clarifier

Lamella Clarifier
(Broken Lamella : over than 50%)

Clear well

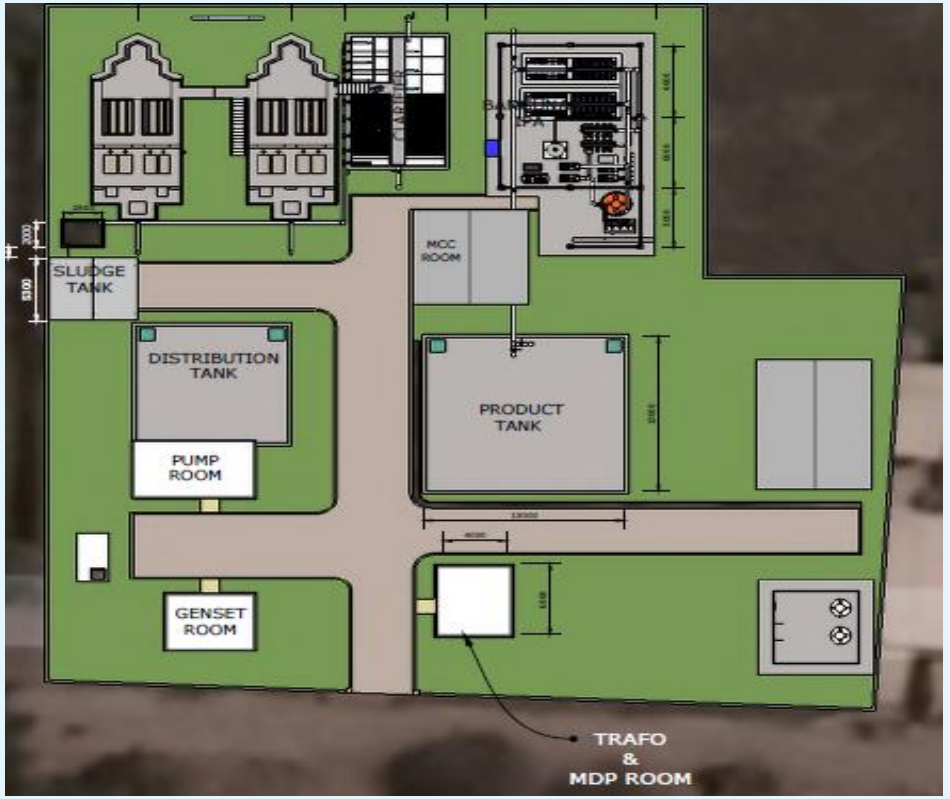
Clear well

Raw Water (River) → Mix/ Coagulation → Sedimentation → Disinfection → Supply

Turbidity < 5NTU

Retrofitting Plan

Capacity : 50L/sec x 2ea = 100L/sec, 8,640m^3/day



Raw Water (River) → Mix/ Coagulation → Sedimentation → Membrane (G-Brane P series) → Disinfection → Supply

Module : 88EA
$J_{inst.}$=1.55m/d
$J_{net.}$ = 1.31m/d
Recovery = 94.0%

Turbidity < 0.1NTU

Construction Status of the Purification Plant

Demolition of existing facilities

Foundation work of the plant

UF Rack Frame manufacturing

Floor construction of the membrane filter area

Sedimentation tank installation

Connect pipes from the existing purification plant

Finish laying tiles inside plant

Purification plant

Project Registration Progress

ID	Name	Proponent	Project Type	Methodology	Status	Countr...
4103	Water Purification System for Safe Drinking Water (SDW) in Indonesia	Synopex Inc.	Energy demand	AMS-III.AV.	Registration requested	Indonesia

COMPLETED

PDD* Development → Pipeline Listing Review → PDD Validation & Project Registration

IN PROGRESS

PDD & MR** Verification → VERRA Verification & Project Registration Complete → Application for Carbon Credit (VCU) Issuance → Issuance of VCU & Trading

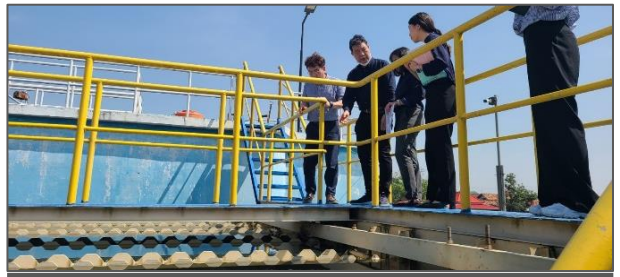
Expecting 2024.07~08

* Project Design Document

** Monitoring Report

Community Consultation

Meeting with PDAM



Water Plant Visit

Baseline Survey

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