Water Reclamation Plant Industry Engagement



Organised By

PUB SINGAPORE'S NATIONAL WATER AGENCY

SWA SINGAPORE WATER ASSOCIATION

Jacobs
Challenging today.
Reinventing tomorrow.

binnies AECOM
ELEVATE · ADVANCE · SECURE
CHANGI WRP PHASE 3

Programme

13 November 2026

Friday, 10.00am – 12.00pm

MSE Hall, Level 25, Environment Building
40 Scotts Road, Singapore 228231

Briefing on PUB's upcoming Water Reclamation Plant projects.

REGISTRATION FROM 9.30AM
Session from 10.00am

OPENING

Welcome Address
Singapore Water Association

Opening Address & Overview of Water Reclamation Plants
Mr Yong Wei Hin, Director, Water Reclamation (Plants) Department, PUB

PROJECT BRIEFINGS

Project 1: New Kranji WRP
Mr Gerry McCrossan, Project Director, Jacobs

Project 2: Changi WRP Phase 3 Expansion
Mr William Yong, Project Director, Binnies & AECOM Joint Venture

Project 3: Changi WRP Phase 1 M&E Asset Replacement
Mr Lim Guo Wei, Senior Engineer, Water Reclamation (Plants) Department, PUB

CLOSING

Q&A Session

Closing Remarks
Dr Kelvin Koh, Director, Industry & Technology Collaboration, PUB

Networking & Refreshments

Welcome Address

Mr Vinod Singh
Vice President, Singapore Water Association
Senior Director, Jacobs

SINGAPORE WATER ASSOCIATION

Opening Address & Overview of WRP

Mr Yong Wei Hin
Director, Water Reclamation (Plants) Department, PUB

Need for Used Water Management and Treatment

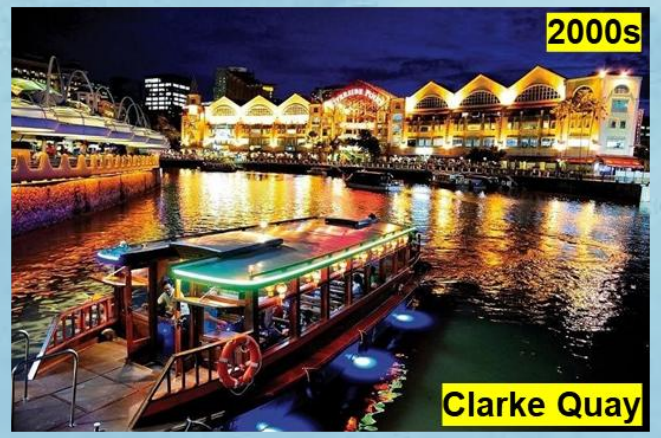
Public Health Protection & Sanitation





Watercourse Protection





Augmentation of Our Water Resources



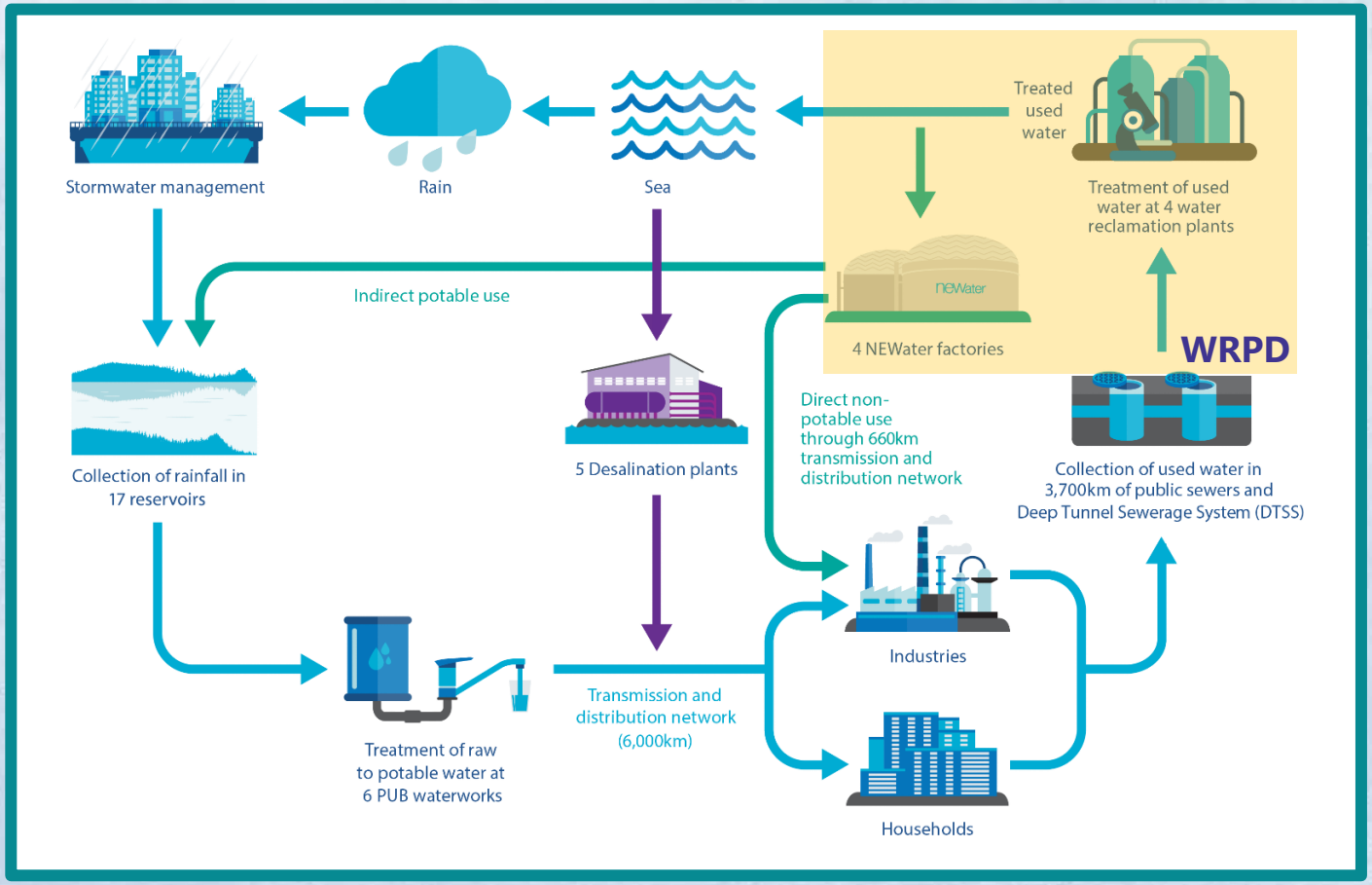


Our Mission

To treat all used water collected efficiently for reclamation and safe discharge into the seas

Water Reclamation Plants (WRP) treat used water from homes, industries and commercial buildings to produce effluent.

NEWater Factories use this effluent as feedstock for NEWater production, while the excess effluent is discharged to sea.



Water Reclamation Plants (Today)

Kranji WRP
151 MLD (33 MGD)



Changi WRP
1,120 MLD (246 MGD)



Total UW Treatment Capacity
of 1,926 MLD (422 MGD)

Jurong WRP
260 MLD (57 MGD)

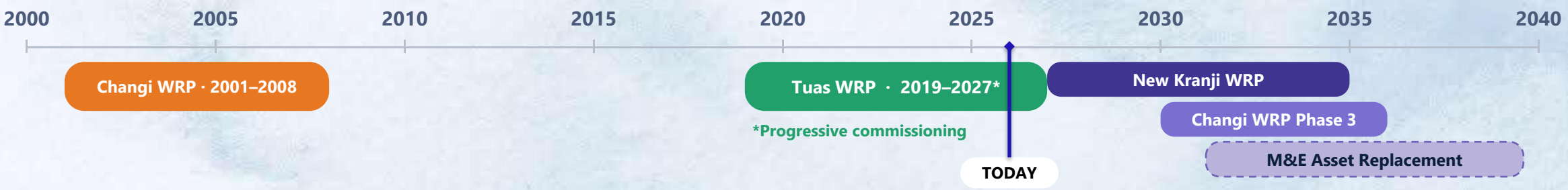


STP1 - 23.5 MLD (5 MGD)
STP2 - 10 MLD (2 MGD)

Ulu Pandan WRP
361 MLD (79 MGD)



Delivering Singapore's Water Reclamation Plants





PART OF DTSS PHASE 1 · 2001–2008

Changi WRP

176 mgd — **Treatment capacity**
Phase 1; now 246 mgd

19 — **Plant contract packages**
12 civil, 7 equipment

PROJECT COST
S$2.2 billion



PART OF DTSS PHASE 2 · COMMISSIONING FROM 2027

Tuas WRP

176 mgd — **Treatment capacity**
143 mgd domestic + 33 mgd industrial

20 — **Plant contract packages**
16 awarded to date

PROJECT COST
Over S$3 billion



NEXT WAVE · THREE PROJECTS · FROM 2027

Build, Expand and Renew

120 mgd — **New Kranji WRP**
replaces 33 mgd KWRP

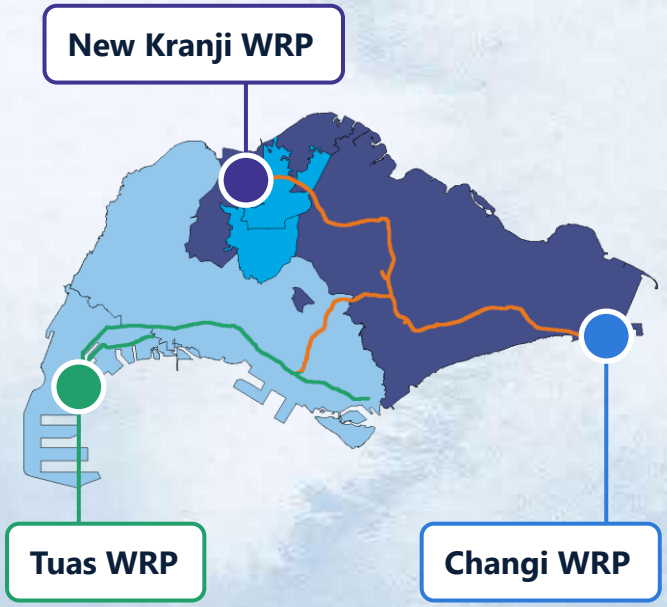
+96 mgd — **Changi WRP Phase 3**
expansion, up to 96 mgd

Changi WRP Phase 1
M&E asset replacement

mgd: million gallons per day.
Capacities and timelines are indicative and subject to change.

Meeting Future Demand: Build, Expand and Renew

Three major projects to meet Singapore's long-term used water needs, from 2027 to the late 2030s





BUILD

New Kranji WRP

Redevelopment of Kranji WRP

USED WATER CAPACITY

33 mgd → 120 mgd

NEWater **22 mgd → 50 mgd**

WHAT'S INCLUDED

- Influent pumping station
- MBR liquids modules
- NEWater factory
- Biosolids and digesters

Consultant: Jacobs

CONSTRUCTION

2027 → 2035



EXPAND

Changi WRP Phase 3

Expansion of existing plant

ADDED CAPACITY

up to +96 mgd

Existing plant **246 mgd**

WHAT'S INCLUDED

- Influent pumping station
- Liquids treatment modules
- Biosolids and digesters

Consultant: Binnies & AECOM JV

CONSTRUCTION

2030 → mid-2030s



RENEW

Changi WRP Phase 1

M&E asset replacement

RENEWAL

End-of-life assets

ASSETS INCLUDED

- Pumps and screens
- MBR membranes
- Centrifuges and dryers
- Electrical and controls

PES tender: ~2027

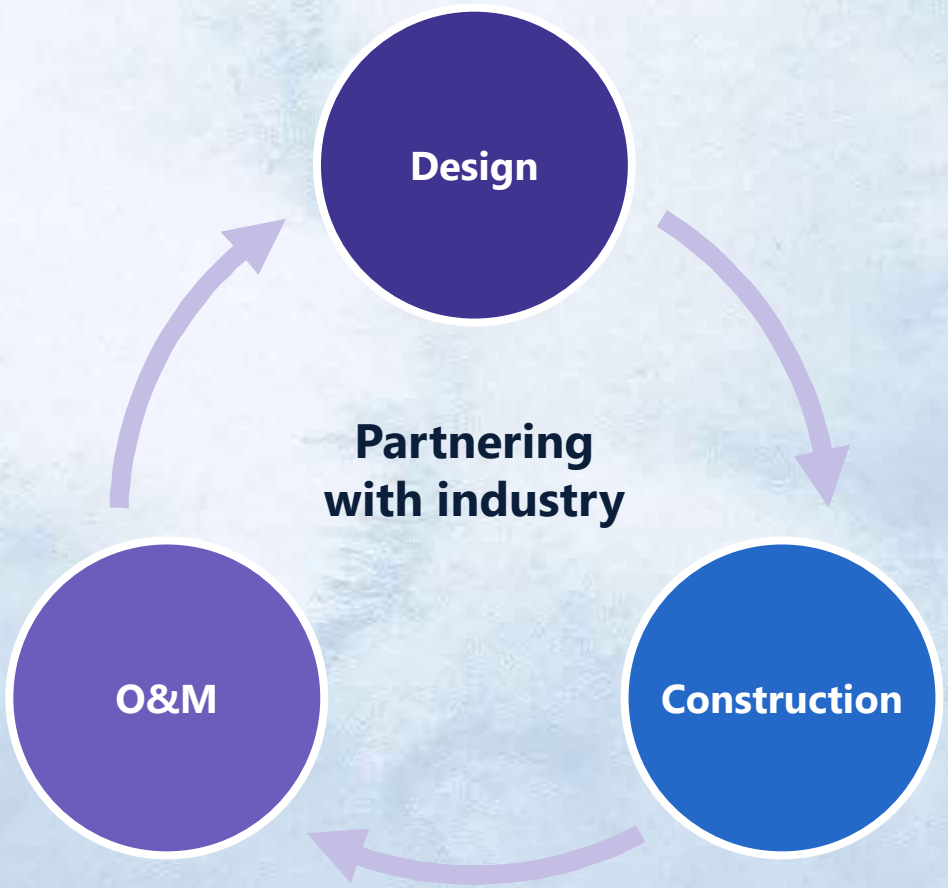
REPLACEMENT WORKS

Early 2030s → late 2030s

mgd: million gallons per day.
Capacities and timelines are indicative and subject to change.

PUB

Partnering with Industry



Collaborative Design

- Early industry engagement and feedback
- Exploring alternative procurement approaches, including ECI
- Constructability and maintainability considerations in design

Safe and Productive Delivery

- Safety as the top priority
- Effective coordination across multiple contracts
- Prefabrication, automation and innovation for productivity

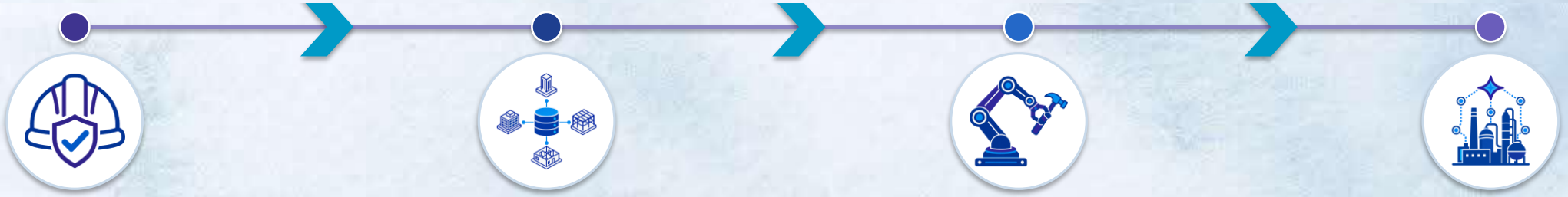
Reliable and Efficient Operations

- Reliable equipment and systems
- Energy-efficient plant operation
- Predictive maintenance and automation

PUB looks forward to partnering with industry on these upcoming projects and values your views and feedback.

ECI: Early Contractor Involvement.
O&M: Operation & Maintenance

Digital Delivery and SMART Plant



01 SAFE

Health & Safety

- Design-for-Safety and constructability reviews to minimise construction risks
- CCTV for real-time site progress monitoring
- Manpower management via biometric, facial recognition or RFID
- Web-based real-time automated instrumentation & monitoring

02 CONNECTED

Common Data Environment

- Consistent asset data and digital handover for integration with digital twins
- Construction integrated delivery and BIM
- Shared cloud construction database for PUB, consultants & contractors to coordinate delivery

03 AUTOMATED

Robotics & Automation

- Improve productivity, reduce construction time and enhance safety
- Construction prefabrication and robotics opportunities
- Remote inspection & monitoring

04 INTELLIGENT

SMART Plant

- Interoperable, cybersecure systems supporting the vision of a Smart AI-Enabled PUB
- Digital twins
- Industrial copilots
- Collaborative robotics

Project Organisation Chart



Mr Yong Wei Hin
Director, Water Reclamation (Plants), PUB

New Kranji WRP



Ms Low Pei Chin
Senior Deputy Director, PUB



Mr Siow Siong Lon
Deputy Director, PUB

Consultant



Mr Gerry McCrossan
Project Director, Jacobs

NKWRPteam@jacobs.com

Changi WRP Phase 3 Expansion



Ms Low Pei Chin
Senior Deputy Director, PUB



Ms Angela Chang
Deputy Director, PUB

Consultant



Mr William Yong
Project Director, Binnies & AECOM JV

cp3industryengagement@
binniesaecomjv.com

Changi WRP Phase 1 M&E Asset Replacement



Mr Ganesan Narayanan
Senior Deputy Director, PUB



Mr Lou Pang Boon
Senior Deputy Director, PUB

Consultant

To Be Appointed
Consultant

PROJECT 1

New Kranji WRP

Mr Gerry McCrossan

Project Director, Jacobs



Surrounding Developments



3D Model Fly Through



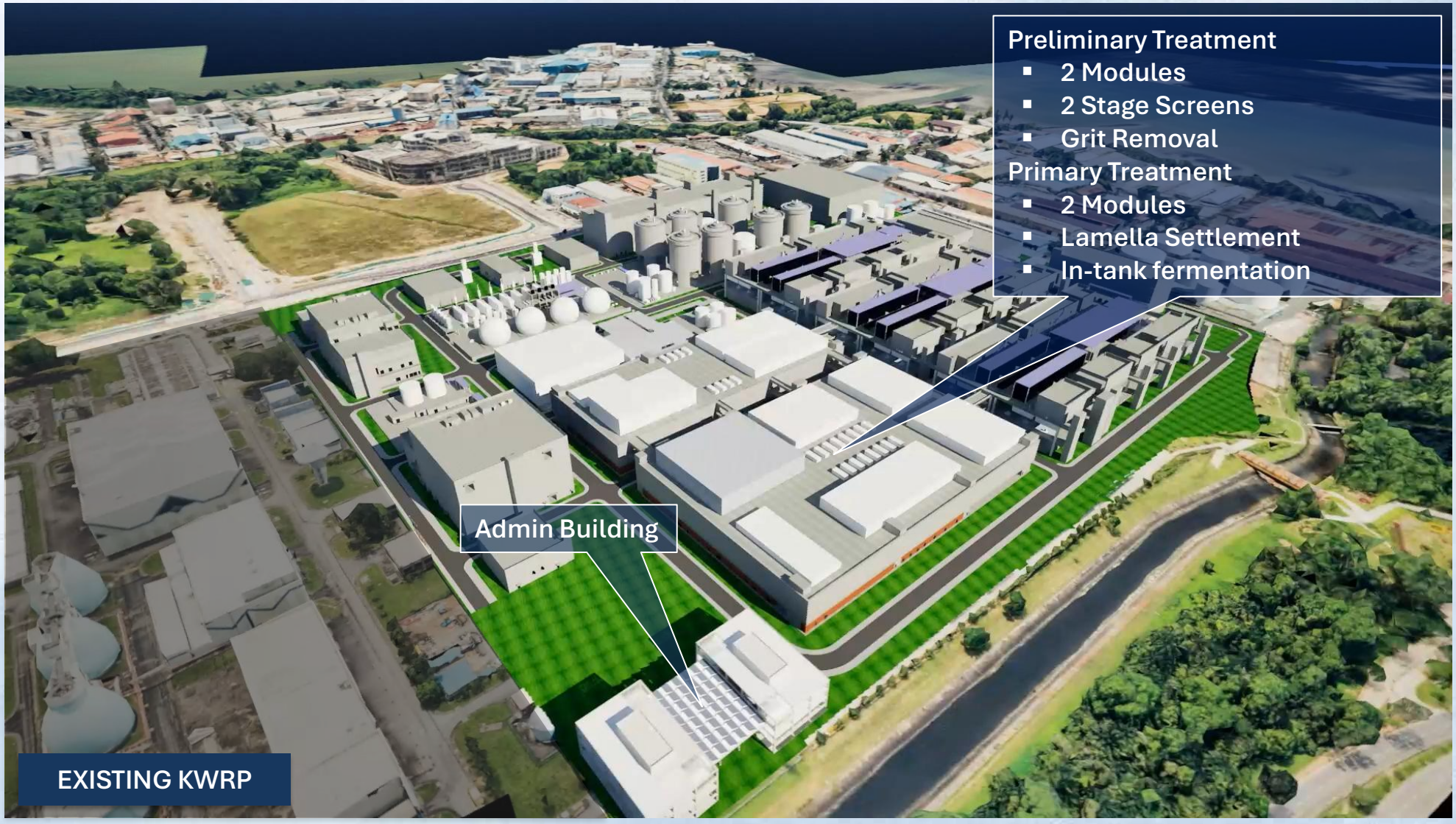
3D Model Fly Through



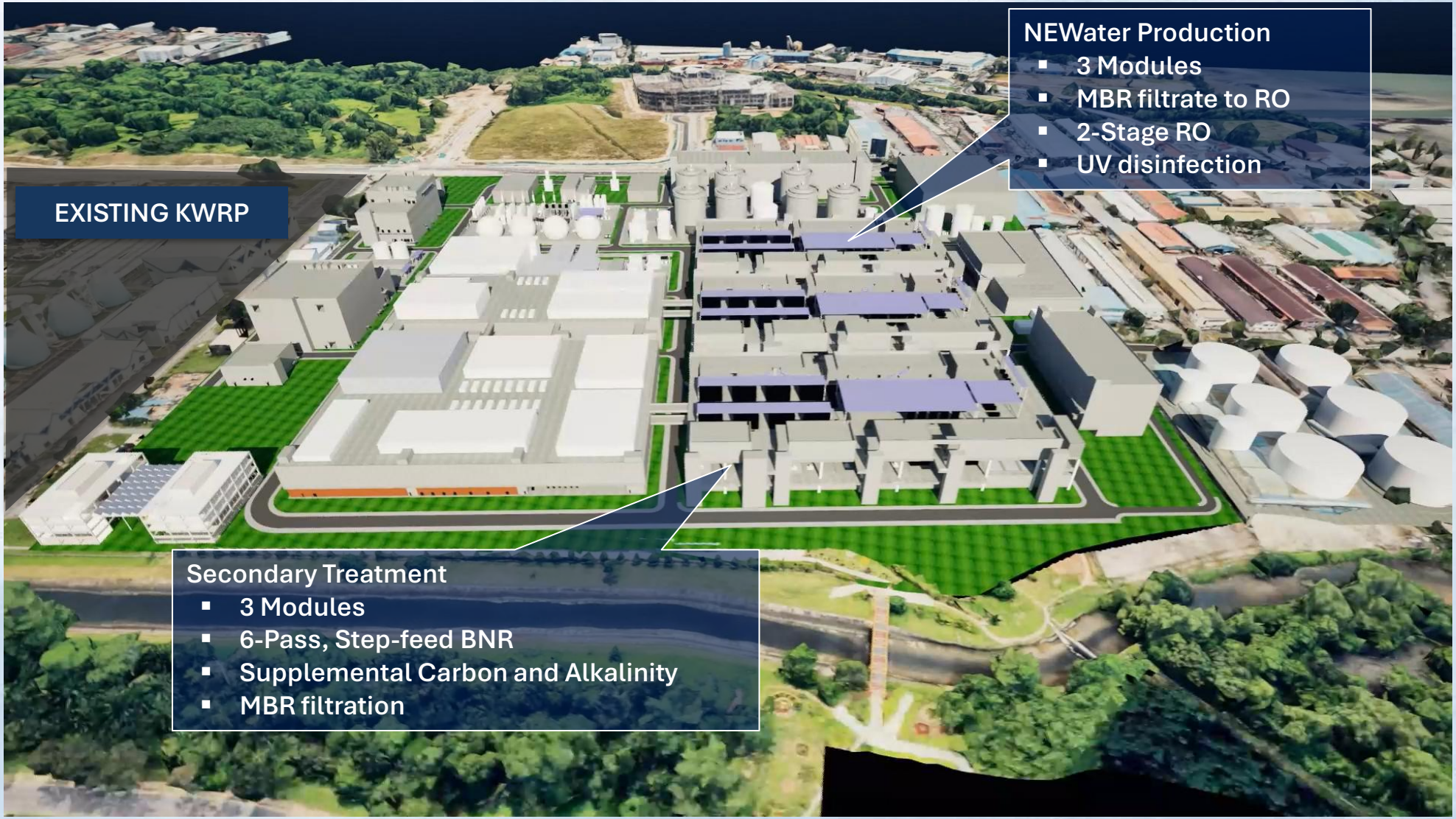
3D Model Fly Through



3D Model Fly Through



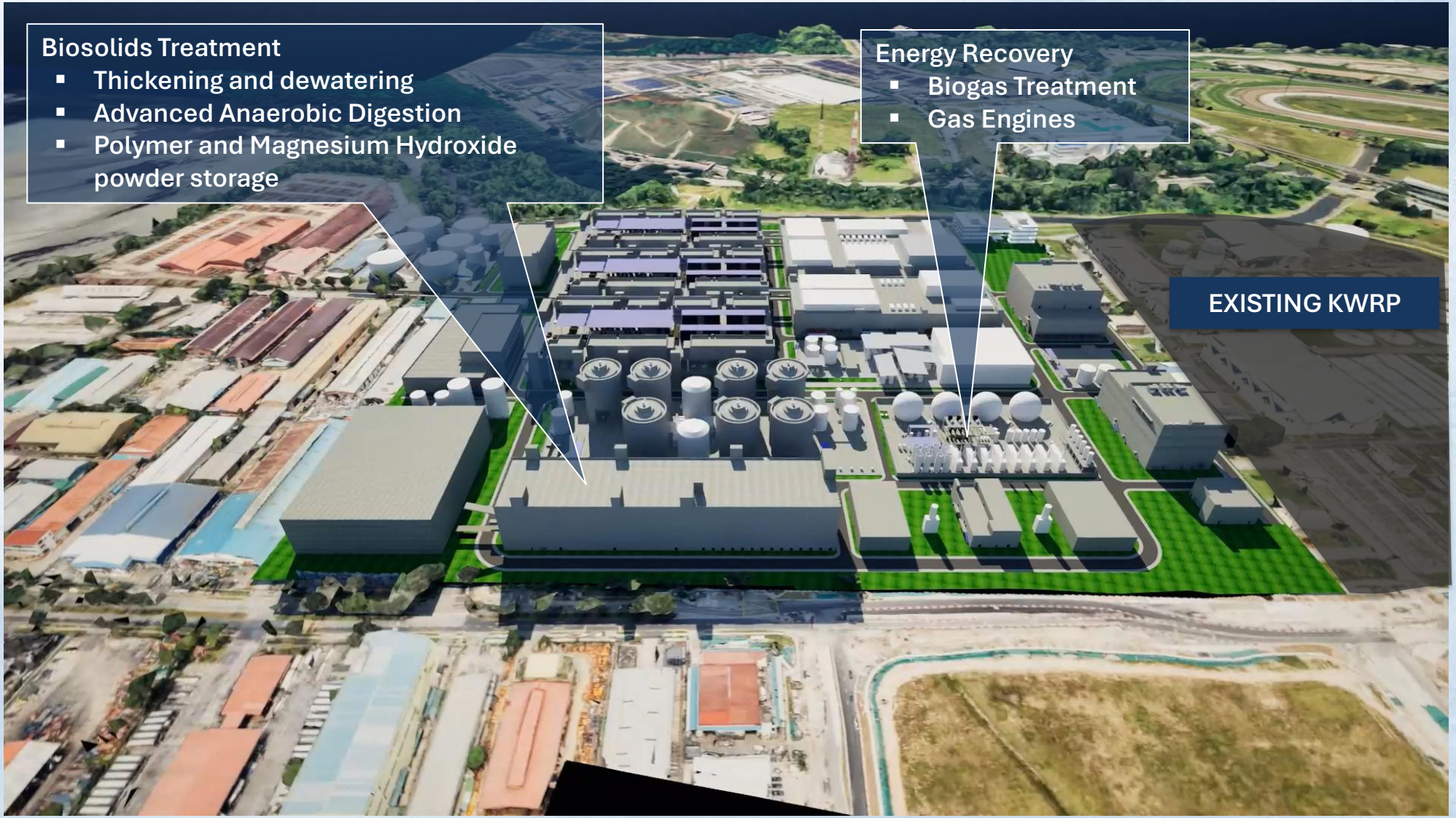
3D Model Fly Through



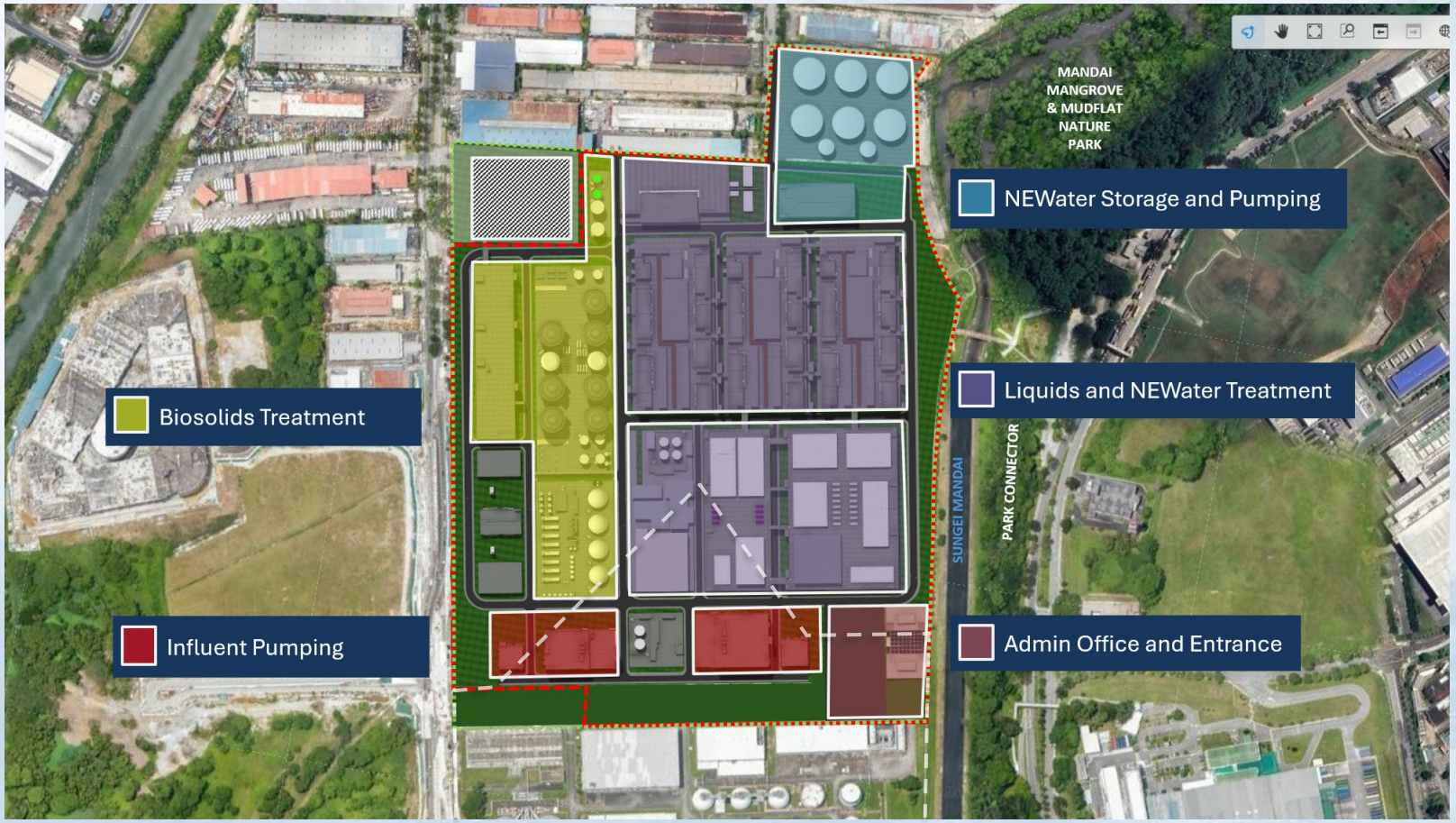
3D Model Fly Through



3D Model Fly Through



Compact Site Presenting Engineering Challenges

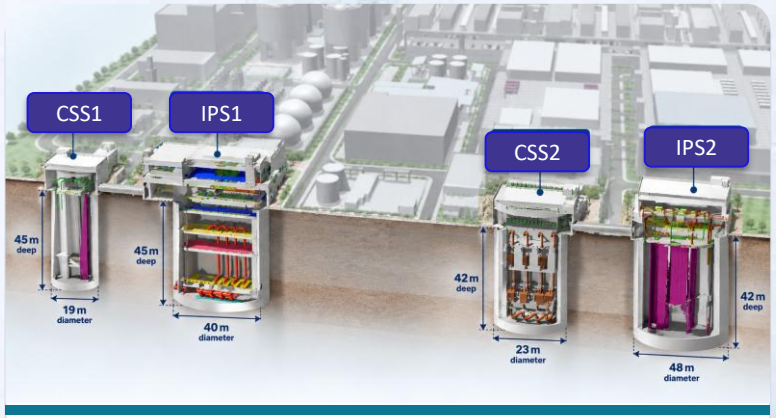


Opportunities:

- **Modularisation**, prefabrication and vertical integration due to constrained site
- **Construction innovation** for safer faster deep shaft construction
- **Digital coordination** to enable efficient management of complex interfaces

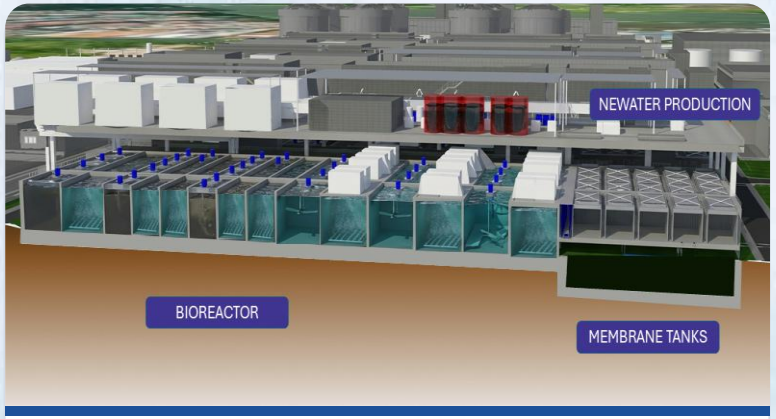
- Biosolids Treatment
- Influent Pumping
- NEWater Storage and Pumping
- Liquids and NEWater Treatment
- Admin Office and Entrance

Major Civil and Structural Opportunities



DEEP SHAFTS & IPS

- Four deep shafts 20-48m diameter
- Two Coarse Screen Shafts (CSS)
- Two Influent Pumping Stations (IPS)
- Deep excavation and shaft construction ~45m
- Temporary works and groundwater control



PROCESS STRUCTURES

- Preliminary, Primary and Biological Treatment Tanks
- Digesters and holding tanks
- Stacked liquids treatment buildings
- NEWater facilities and storage



SITEWIDE WORKS

- Earthworks to top up platform levels to meet coastal protection requirements
- Foundations, utilities and corridors
- Access and construction logistics
- Interfaces with live plant

Advanced Treatment and MEICA Opportunities



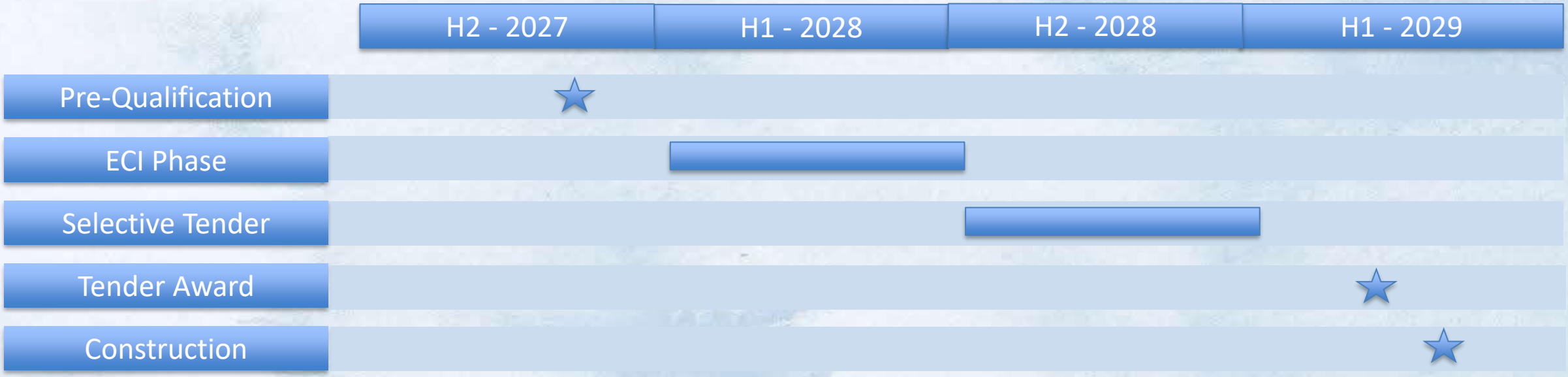
Opportunities:

- **Advanced Treatment**, MBR membranes, aeration/MABR, sidestream and mainstream N/P, energy recovery
- **Controls and Automation** APC, Power monitoring, SCADA
- **Smart Operations and Maintenance,** automated chemical handling, autonomous vehicles, digital twins for operation and assets

Early Works to Prepare the Site for Main Construction



Early Contractor Involvement (ECI) | How can industry participate

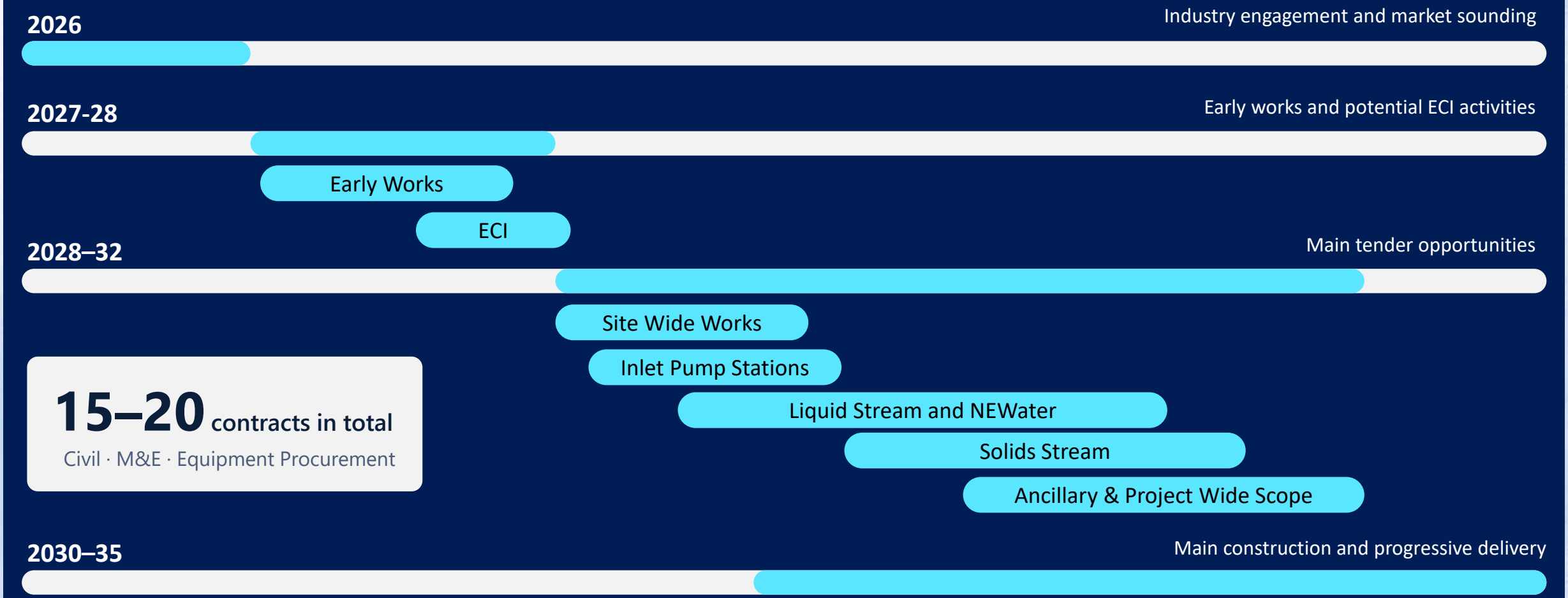


- Influent Pumping Stations currently under consideration for delivery under an ECI model
- ECI process aligned with the BCA Design-Bid-Build (DBB) model.
- Prequalification evaluation and shortlisting of up to five tenderers to participate; only shortlisted tenderers will be invited to participate in the ECI Phase and Selective Tender.

- ECI phase delivered through a structured collaborative workshop approach focused on:
  - Innovation
  - Productivity improvements and value engineering

Multiple Procurement Opportunities from 2027 Onwards

Preparing Industry for NKWRP Delivery



The Way Forward

RFI – Early next year to formally seek views on:

- Ideas, concerns, suggestions
- What went well, and not so well, on previous contracts
- What would elevate the project execution for all



Get in touch to express interest, ask questions…

NKWRPteam@jacobs.com

PROJECT 2

Changi WRP Phase 3 Expansion

Mr William Yong
Project Director, Binnies & AECOM Joint Venture

Overview of Changi WRP



Background

- Binnies & AECOM Joint Venture is appointed as the Consultant for the Professional Engineering Services for the Phase 3 Expansion of Changi Water Reclamation Plant
- Existing Changi WRP is constructed in Phases: Liquids Modules 1-2 in 2008, Liquids Modules 3 in 2025
- Changi NEWater Factories are placed on the rooftops of Liquids Modules 1-3

Phase 3 Expansion:

- Involves the tunneling works to new Influent Pumping Station, construction works for a 96 MGD Liquids Modules, fitted with up to 96 MGD of MEICA works, and construction of new biosolids building
- Expected to be completed by mid 2030s

Scope of Works



Tunneling Works

Breakthrough of existing DTSS1 and connection to new influent pumping station



Influent Pumping Station

C&S / MEICA including pumping station, deep shafts, screens & pumps



Liquid Treatment Modules

C&S / MEICA including Primary Sedimentation Tanks, Membrane Bioreactors, Wet Weather Treatment Facility



Biosolids Treatment Facility

C&S / MEICA including Biosolids Building, Digesters, Centrifuges, Dryers

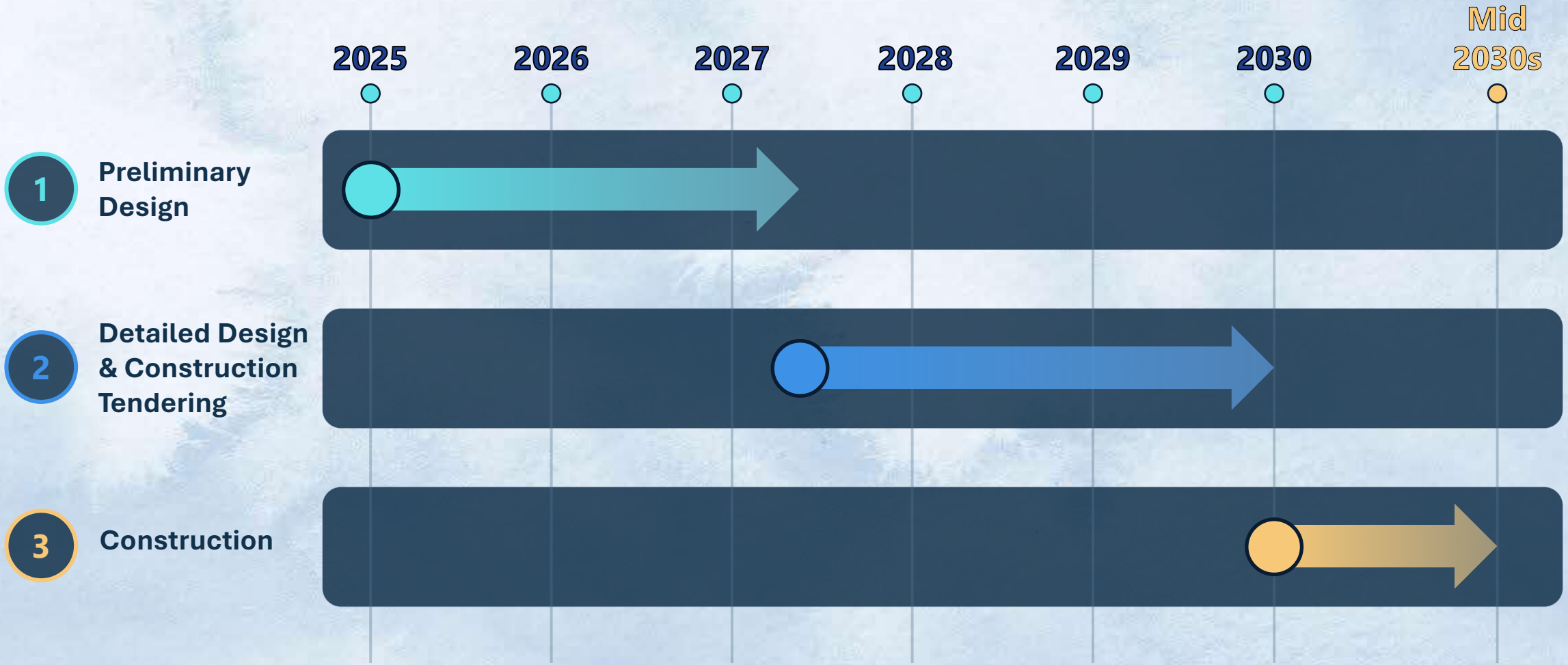


Plant-Wide

Power Infra, Site-Wide Facilities, Process Yard Piping, SCADA, SMART Plant

C&S: Civil and Structural. MEICA: Mechanical, Electrical, Instrumentation, Control and Automation.
Scope of works is indicative and subject to change

Indicative Project Timeline



Contact Details For Enquiries

William Yong
Binnies & AECOM Joint Venture
Project Director
cp3industryengagement@binniesaecomjv.com

Please include subject heading:

Changi WRP Phase 3 Expansion Industry Briefing Enquiries

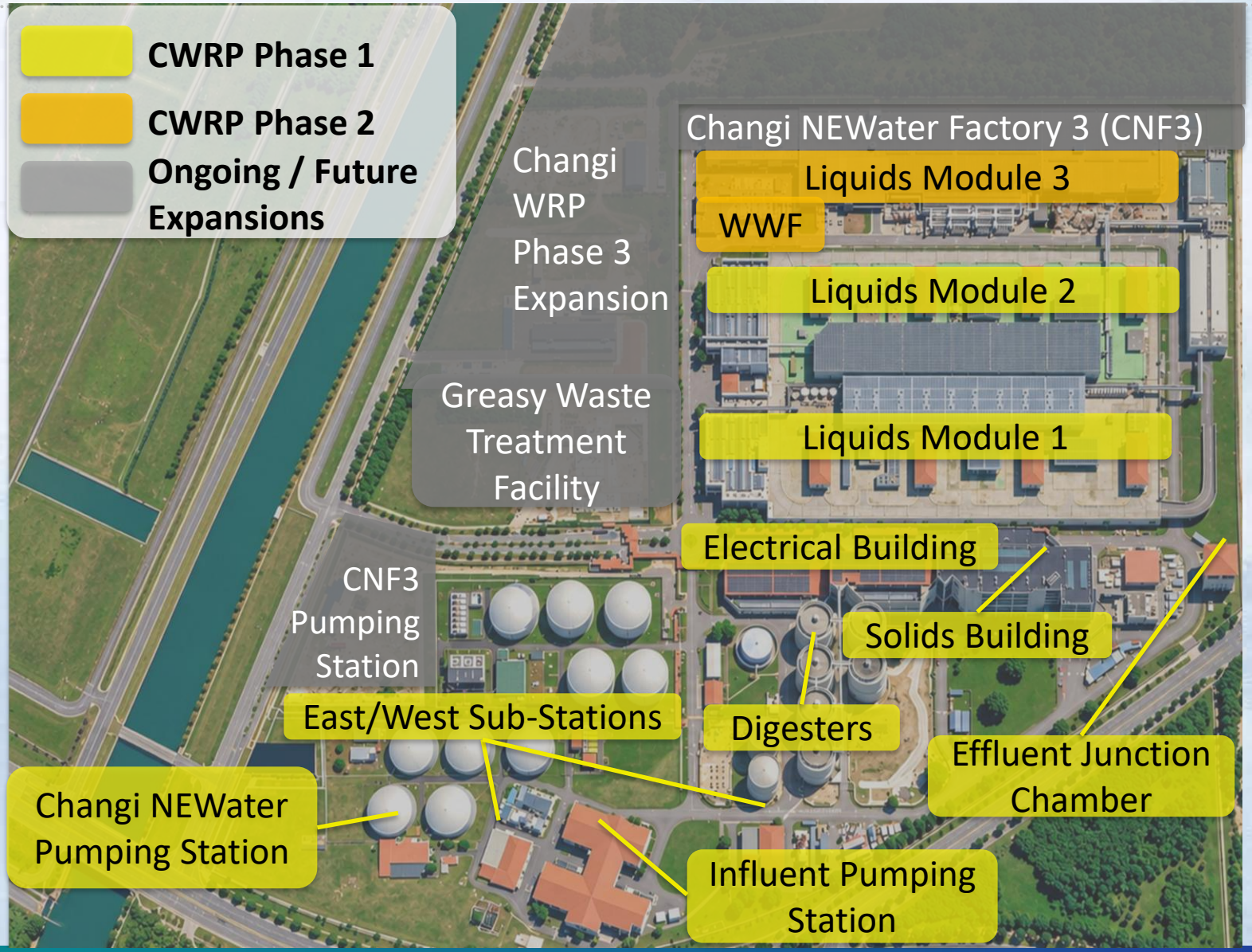
PROJECT 3

Changi WRP Phase 1 Asset Replacement Works

Mr Lim Guo Wei
Senior Engineer, PUB



Changi WRP Overview



CWRP Phase 1
202 MGD

CWRP Phase 2
44 MGD

Wet Weather Facility
44 MGD

Changi WRP Phase 1&2 Overview

2009
CWRP Phase 1
176 MGD



2018
Wet Weather Facility
44 MGD (for wet weather)



Ongoing Project
Changi NEWater Factory 3
50 MGD



Future
CWRP Phase 1 Asset Replacement



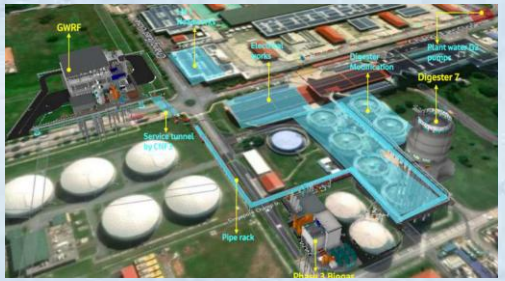
2017
Retrofit MBR System (CWRP Phase 1)
+26 MGD



2025
CWRP Phase 2 Expansion
+44 MGD



Ongoing Project
Greasy Waste Treatment Facility
6,000m3/month



Project Overview

CWRP Phase 1 comprises ageing Mechanical & Electrical (M&E) assets, including pumps, MBR membranes and SCADA/PLC systems, which requires **progressive renewal** to ensure the continued **reliability and resilience** of used water treatment operations and feedstock supply for NEWater Production.

Indicative Scope and Coverage Area



1. Influent Pumping Station / Effluent Junction Chamber
2. Liquids Modules 1 & 2
3. Solids Facilities & Digesters
4. Electrical Building & Sub-Stations
5. Changi NEWater Pumping Station

Proposed scope of works, including identified coverage areas and equipment for replacement, are indicative and subject to change.

PUB

Examples of Changi WRP Phase 1 Equipment

Bar Screens



Standby Generators



MBR Membranes



Magnetic Flowmeters



Primary Sedimentation Tanks



Centrifuges



Odour Control Facilities



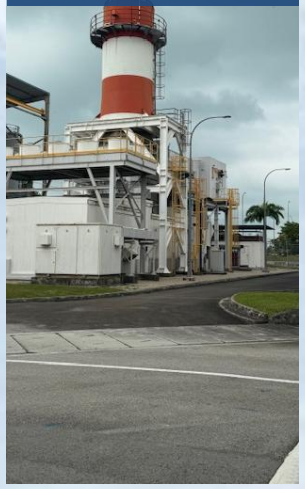
SCADA & PLC System



Transformers



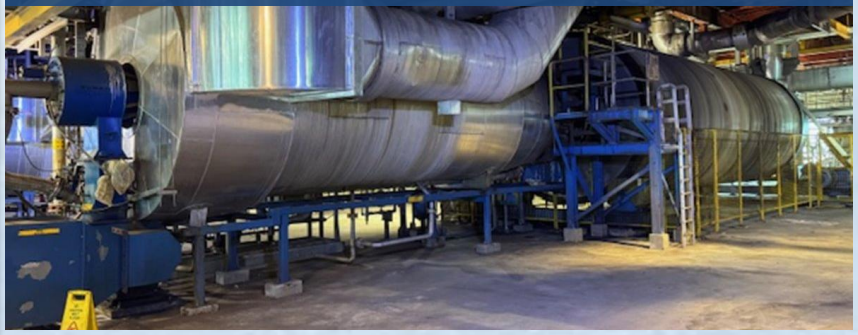
Gas Turbine Generators



Influent Pumps



Rotary Drum Dryers



Project Constraints

01 **Brownfield Integration & Operational Continuity**

Coordinate phased replacement works, shutdowns, isolations, system tie-ins, testing and commissioning within an operational plant.

02 **Concurrent Works & Site Logistics**

Coordinate with ongoing projects while managing shared work areas, restricted access and limited space for site logistics.

03 **Skilled Workforce & Resource Availability**

Secure experienced engineering and technical personnel amid competing demands from concurrent projects.

Indicative Project Timeline

NEXT STEP

Calling of PES Tender

REPLACEMENT OVER THE NEXT DECADE

Preliminary Design

Studies, assessments & concept development

Detailed Design

Engineering development

Calling M&E Tenders

Tender Preparation and Calling

Phased Replacement Packages

Progressive implementation and changeover



THANK YOU

Thank you for joining us today.

PUB will engage industry further in 2027 as the delivery approach for these projects is developed. Let us know if you would like to be part of it.

Project enquiries

New Kranji WRP

NKWRPteam@jacobs.com

Changi WRP Phase 3 Expansion

cp3industryengagement@binniesaecomjv.com

Feedback and Registration of Interest

https://go.gov.sg/pub-wrp-fb

Today's slides

Available on PUB's website after the session

pub.gov.sg/Resources/Publications