

OCTOBER 25, 2023

---

# Unlocking Real-Time Construction Accuracy

AVEVA E3D Model Integration with Real-Time Drone Scans

Haqi Hasan and Ibtisam Al-Faris

**AVEVA**



D.R. Ltd.



# Delta River

EPC- MOD Water Treatment Plant

- Located in the Middle East.
- Specializes in Water and Wastewater management.
- Manages projects worth 100s of millions of dollars in different countries.
- Works with the oil industry on several projects.



# Project: EPC-MOD Water Treatment Plant (WTP)



## Capacity

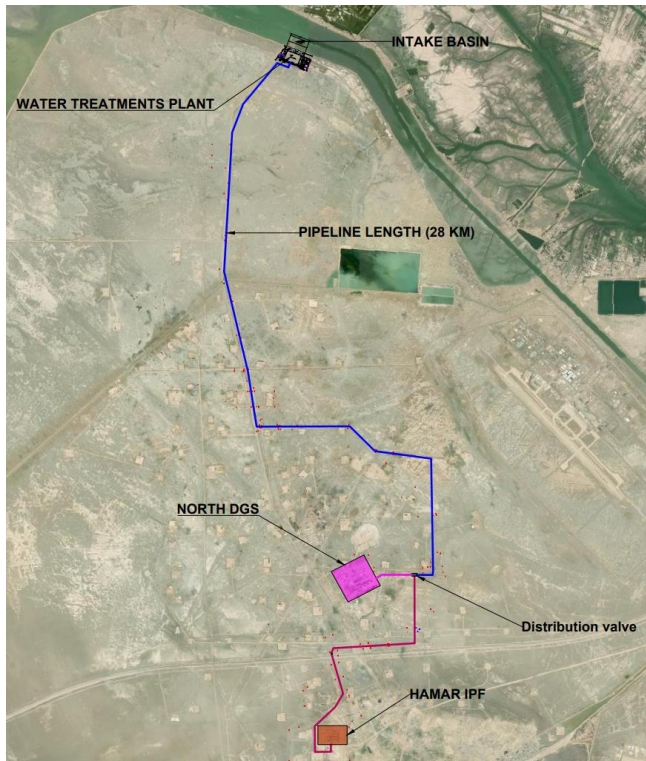
300 KBWPD and considering a future expansion up to 600 KBWPD.

## Location

Basra, Southern Iraq.

## Purpose

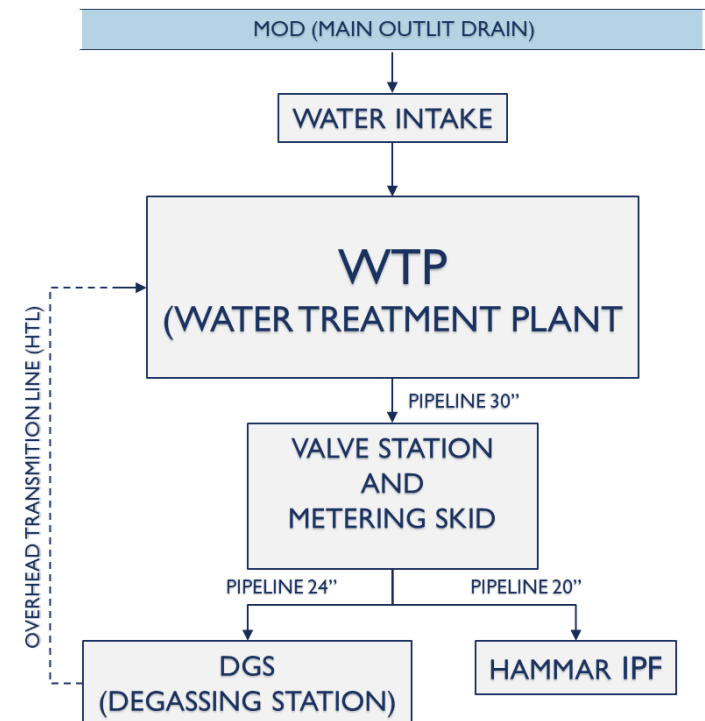
Supply Zubair Oil Field with water for injection purposes in oil fields.



## Main parts of the project:

- 1- Intake
- 2- Water Treatment Plant (WTP)
- 3- Valve Station
- 4- Pipeline and Tie-in Points
- 5- OHTL

- 30" diameter Pipeline
- 20" diameter Pipeline
- 24" diameter Pipeline





# Project: EPC-MOD Water Treatment Plant (WTP)

## Capacity

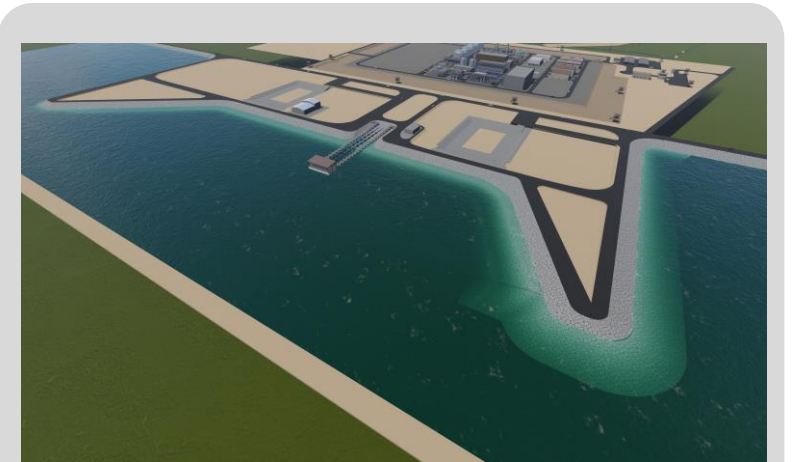
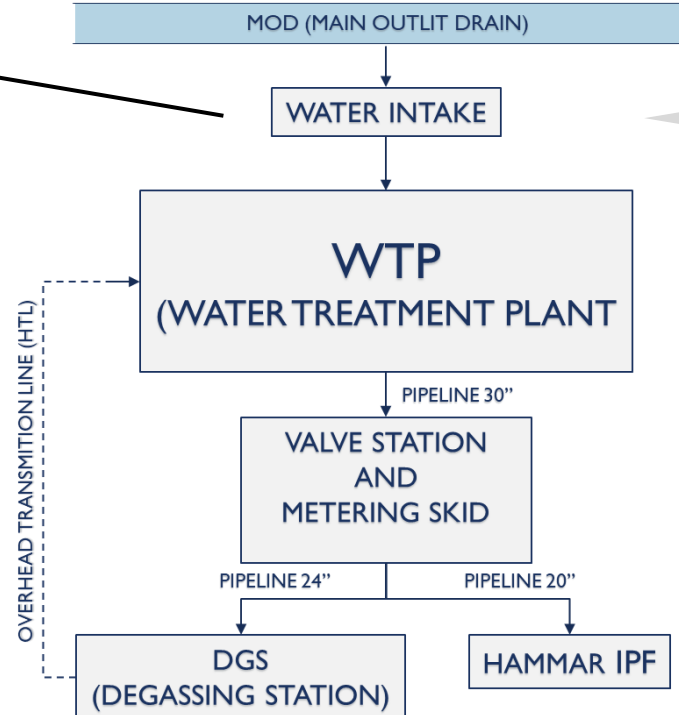
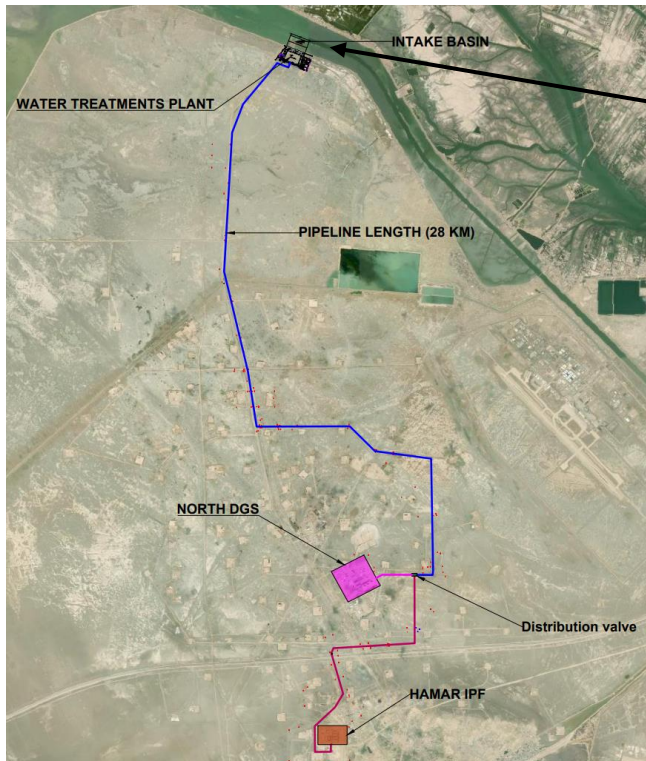
300 KBWPD and considering a future expansion up to 600 KBWPD.

## Location

Basra, Southern Iraq.

## Purpose

Supply Zubair Oil Field with water for injection purposes in oil fields.



Contains the main water source for the project.

# Project: EPC MOD Water treatment plant.

## Capacity

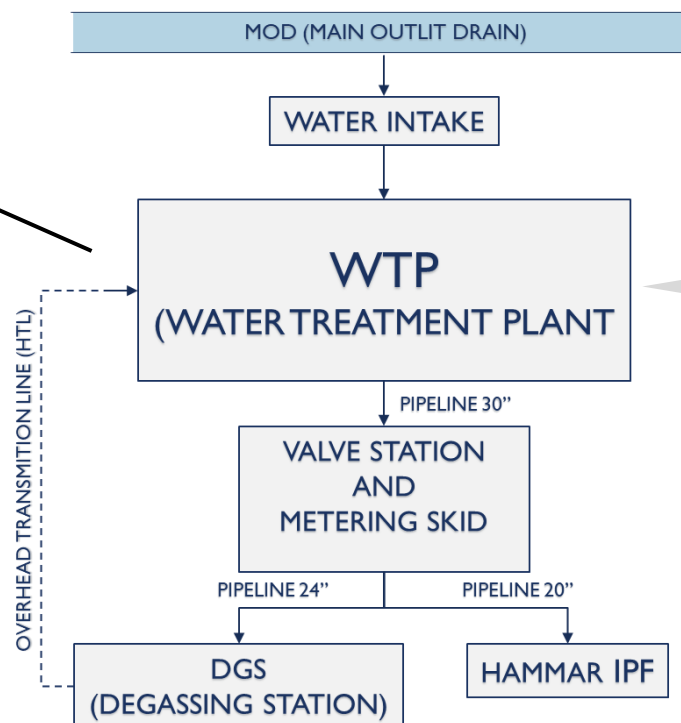
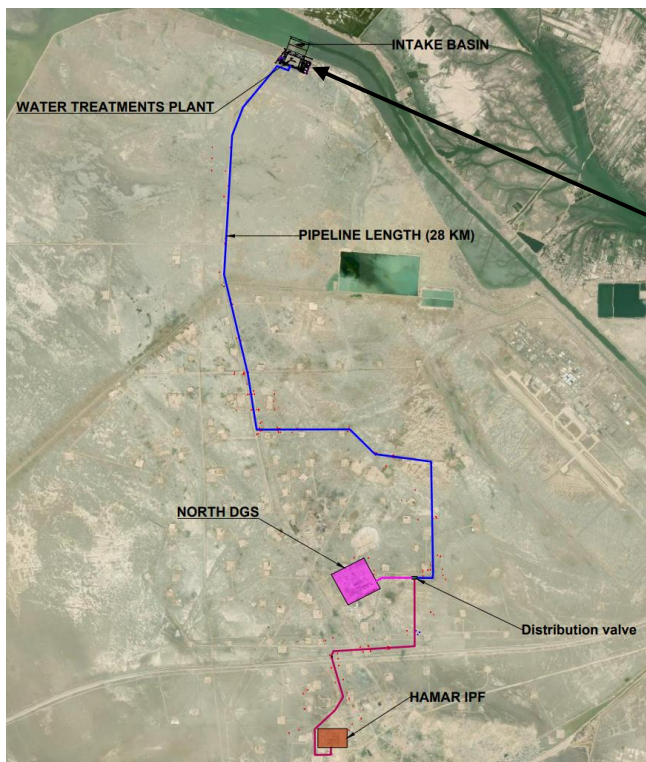
300 KBWPD and considering a future expansion up to 600 KBWPD.

## Location

Basra, Southern Iraq.

## Purpose

Supply Zubair Oil Field with water for injection purposes in oil fields.



The main location of processing water.

# Project: EPC MOD Water treatment plant.

## Capacity

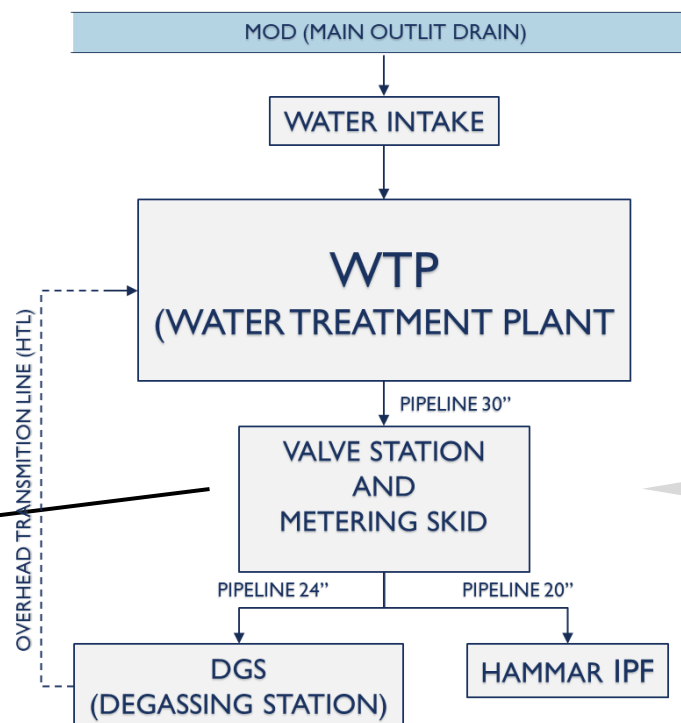
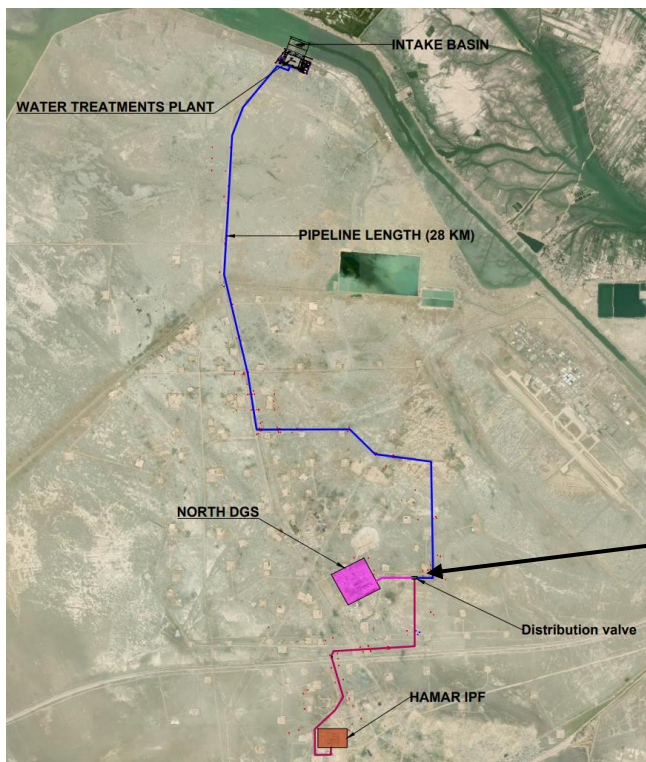
300 KBWPD and considering a future expansion up to 600 KBWPD.

## Location

Basra, Southern Iraq.

## Purpose

Supply Zubair Oil Field with water for injection purposes in oil fields.



Controls the distribution of the processed water.



# Project: EPC MOD Water treatment plant.

## Capacity

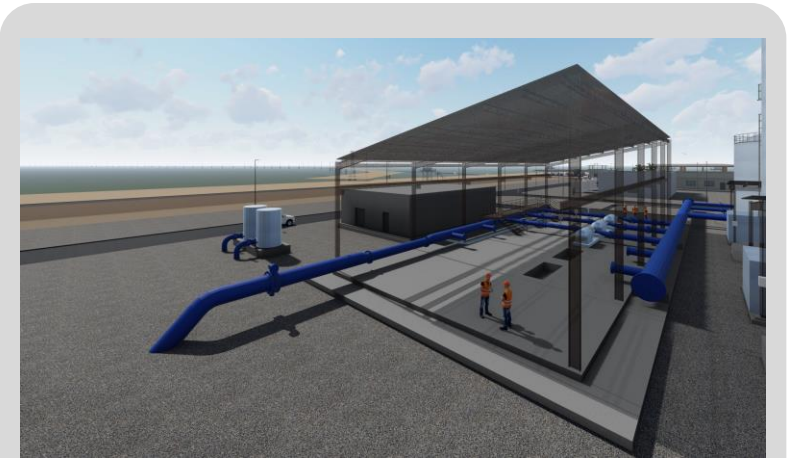
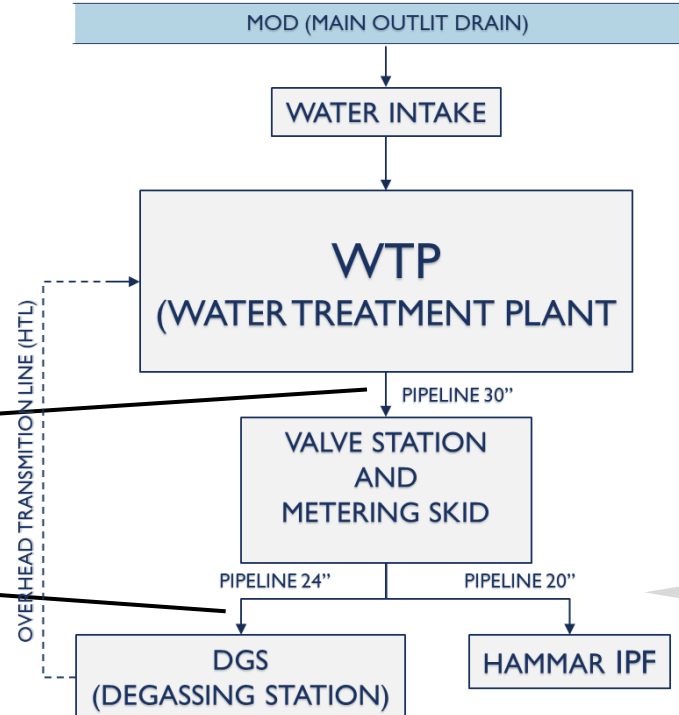
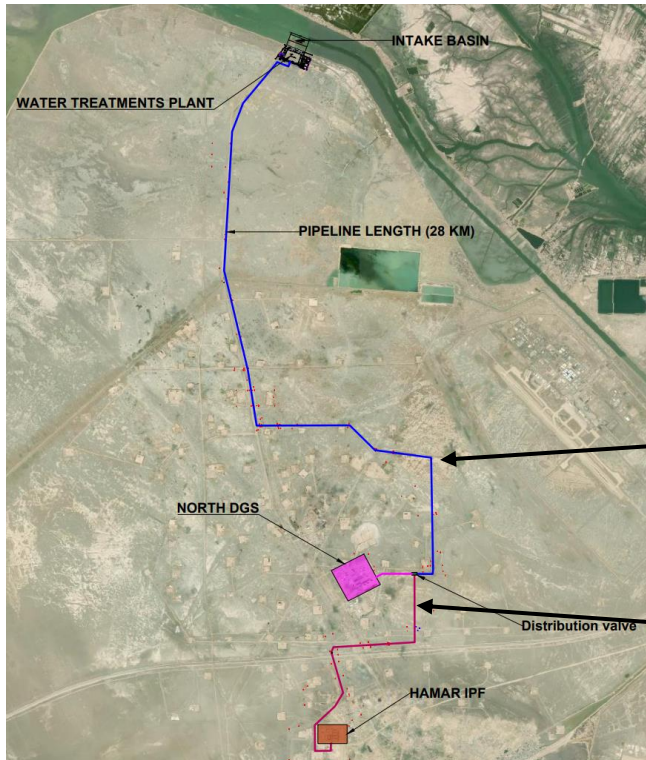
300 KBWPD and considering a future expansion up to 600 KBWPD.

## Location

Basra, Southern Iraq.

## Purpose

Supply Zubair Oil Field with water for injection purposes in oil fields.



28 km in total length with 2 tie-in points to deliver the processed water.

# Project: EPC MOD Water treatment plant.

## Capacity

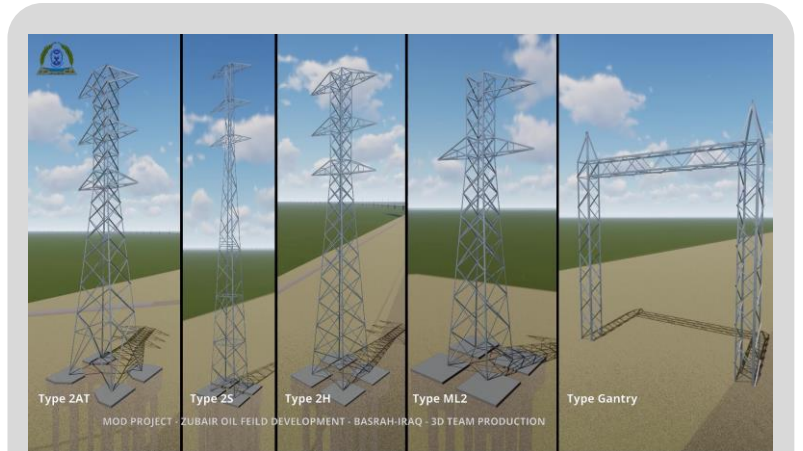
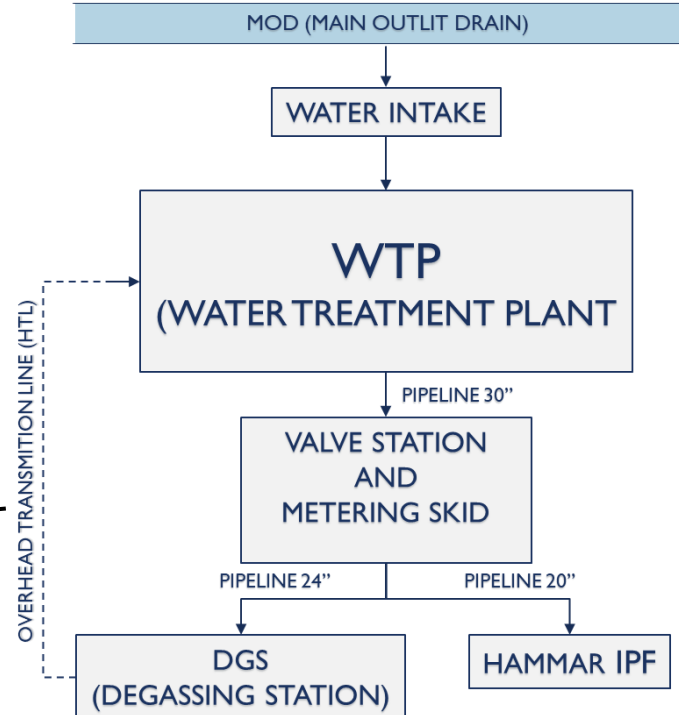
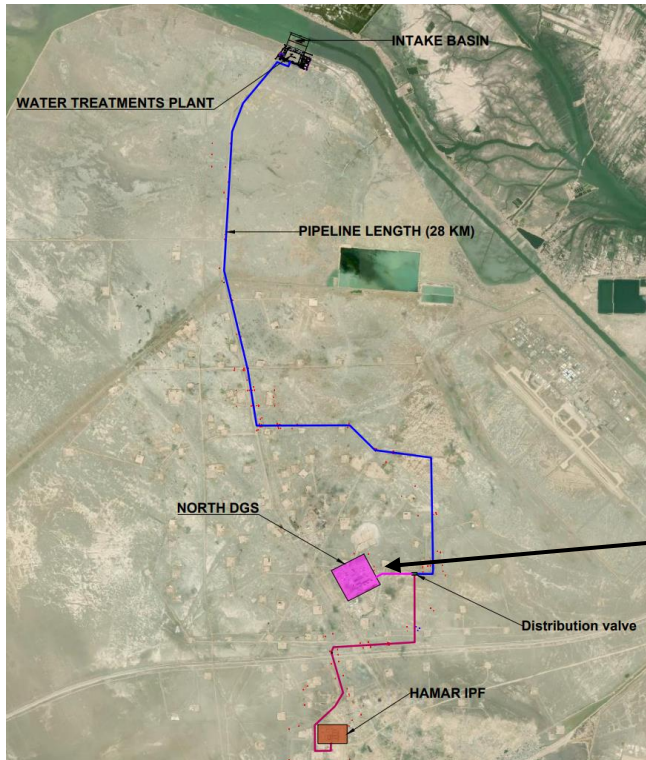
300 KBWPD and considering a future expansion up to 600 KBWPD.

## Location

Basra, Southern Iraq.

## Purpose

Supply Zubair Oil Field with water for injection purposes in oil fields.

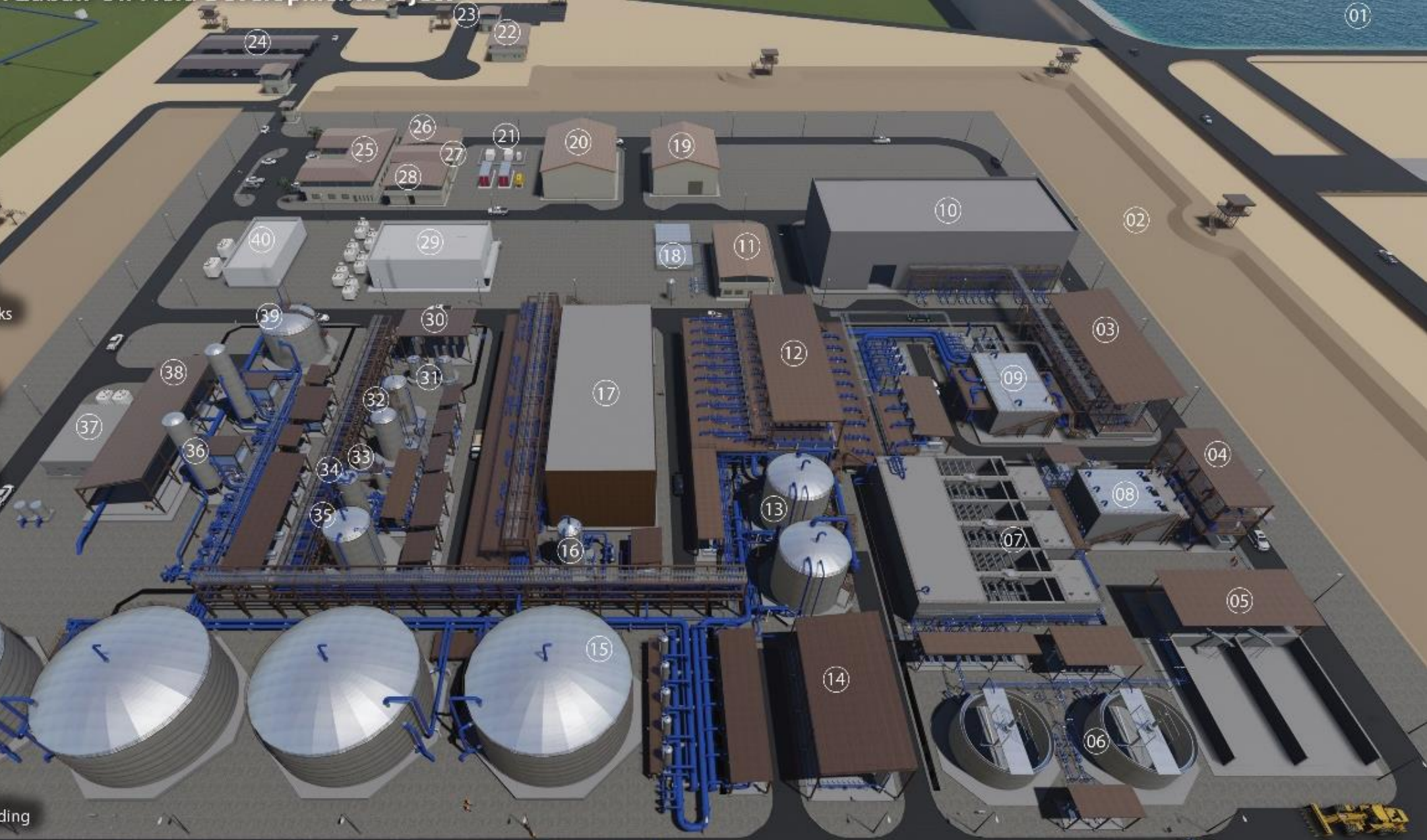


Overhead Transmission Line with almost 134 towers following the path of the pipeline.



# KEY:

- 1) Intake Basin
- 2) Buffer Area
- 3) Chemical Mixing Area 1
- 4) Coarse Screens
- 5) Sludge Treatment Area
- 6) Thickeners
- 7) Clarifier Tanks
- 8) Sand Sedimentation Tanks
- 9) Sand Stabilizer Tank
- 10) Chemical Building
- 11) Control Building
- 12) UF (Ultrafiltration) System
- 13) Ultrafiltration Permeate Tanks
- 14) Chemical Mixing Area 2
- 15) Storage Tanks
- 16) UF C.I.P. Tank
- 17) NF (Nanofiltration) System
- 18) Fire Fighting System
- 19) Maintenance Building
- 20) Warehouse
- 21) Generators and Fuel Tanks
- 22) Security Building
- 23) Access Point To WTP
- 24) Garage
- 25) Administration Building
- 26) Clinic Building
- 27) Laboratory Building
- 28) Operator Building
- 29) MCC Building
- 30) Compressed Air area
- 31) Potable Water Tanks
- 32) Service Water Tanks
- 33) RO C.I.P. Tank
- 34) NF C.I.P. Tank
- 35) NF Permeate Water Tank
- 36) Deoxygenation Towers
- 37) Pump Station Electrical Building
- 38) Pump Station
- 39) Nitrogen Blanket Tank
- 40) Electrical Substation Building



# Challenge: Monitoring Projects in Harsh Environments

EPC-MOD had several factors that made monitoring the project a main area of concern:



Located in an isolated, desert region



Soil condition (muddy area)



Most of the staff was working remotely



Unexploded ordnance (UXO) area



Design phase was happening simultaneously with the construction phase



Complexity and size of the project



Scorching temperatures on-site

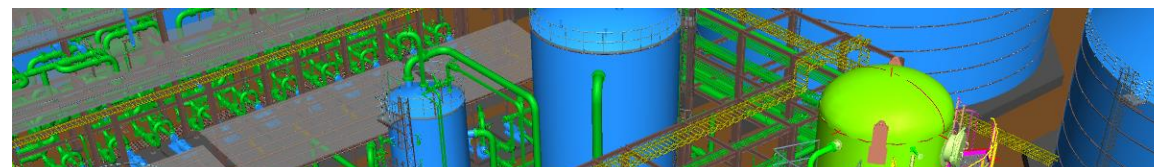
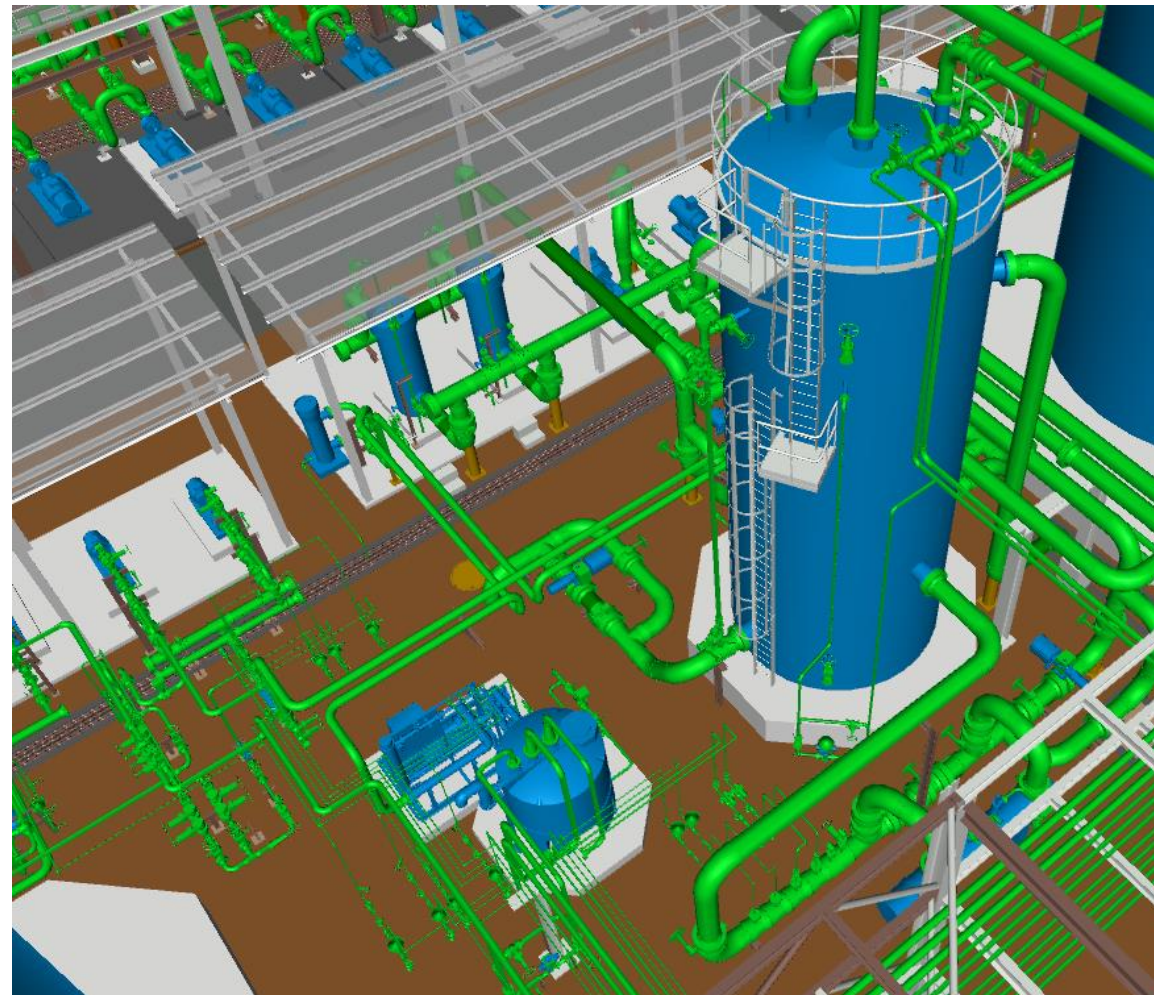
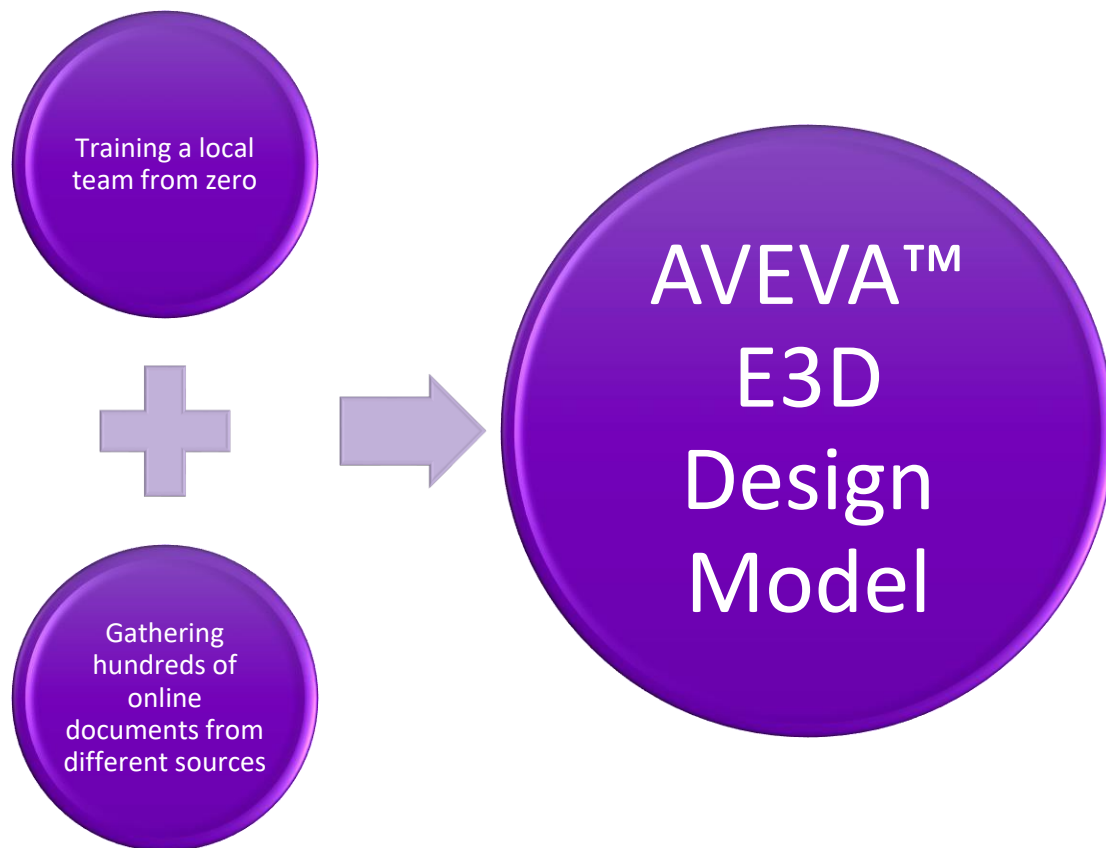


Commitment to implement international standards



# Presenting AVEVA™ E3D Design

The start of a new stage in the project



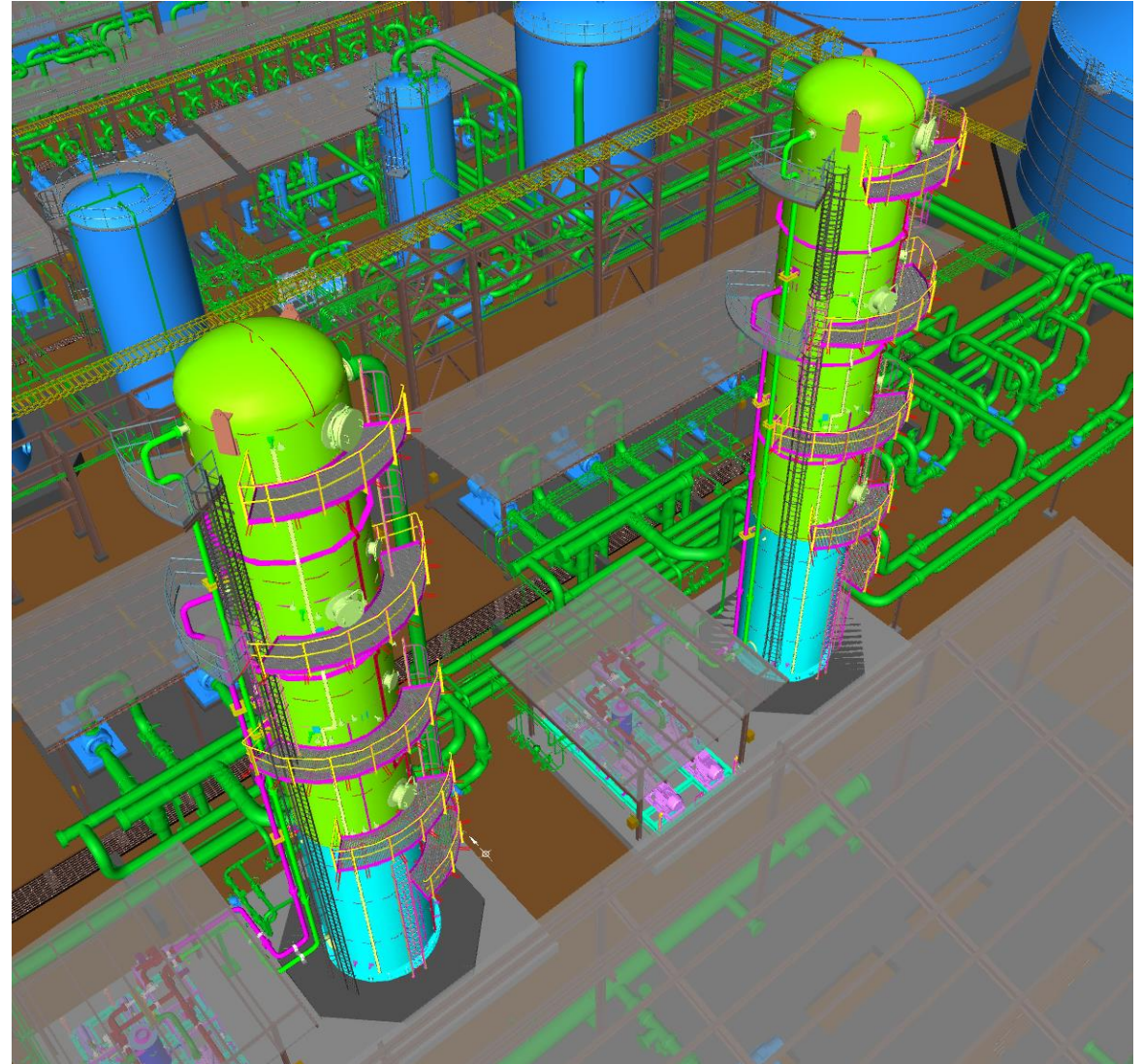
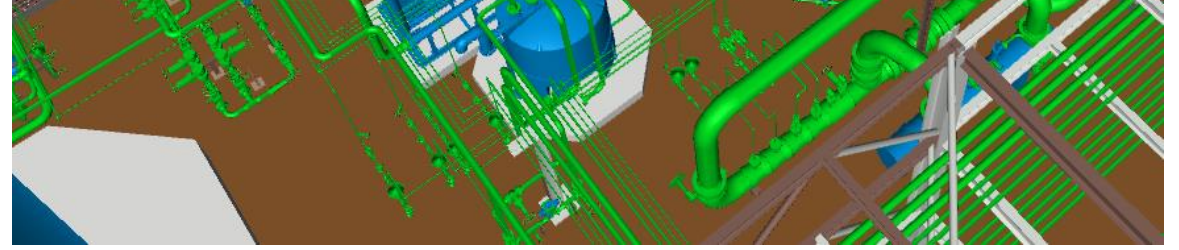


# Presenting AVEVA™ E3D Design

Features that lead to choosing AVEVA™ E3D:

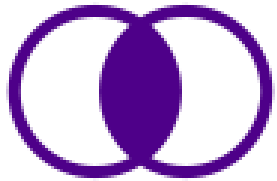


Primary tool for visually presenting all the project data in 3D. Therefore, identifying missing data, incorrect data and misallocated objects.

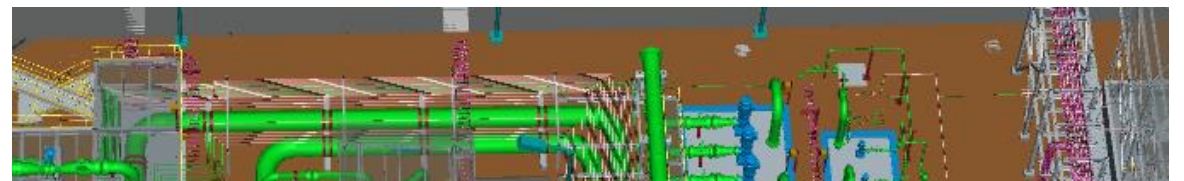
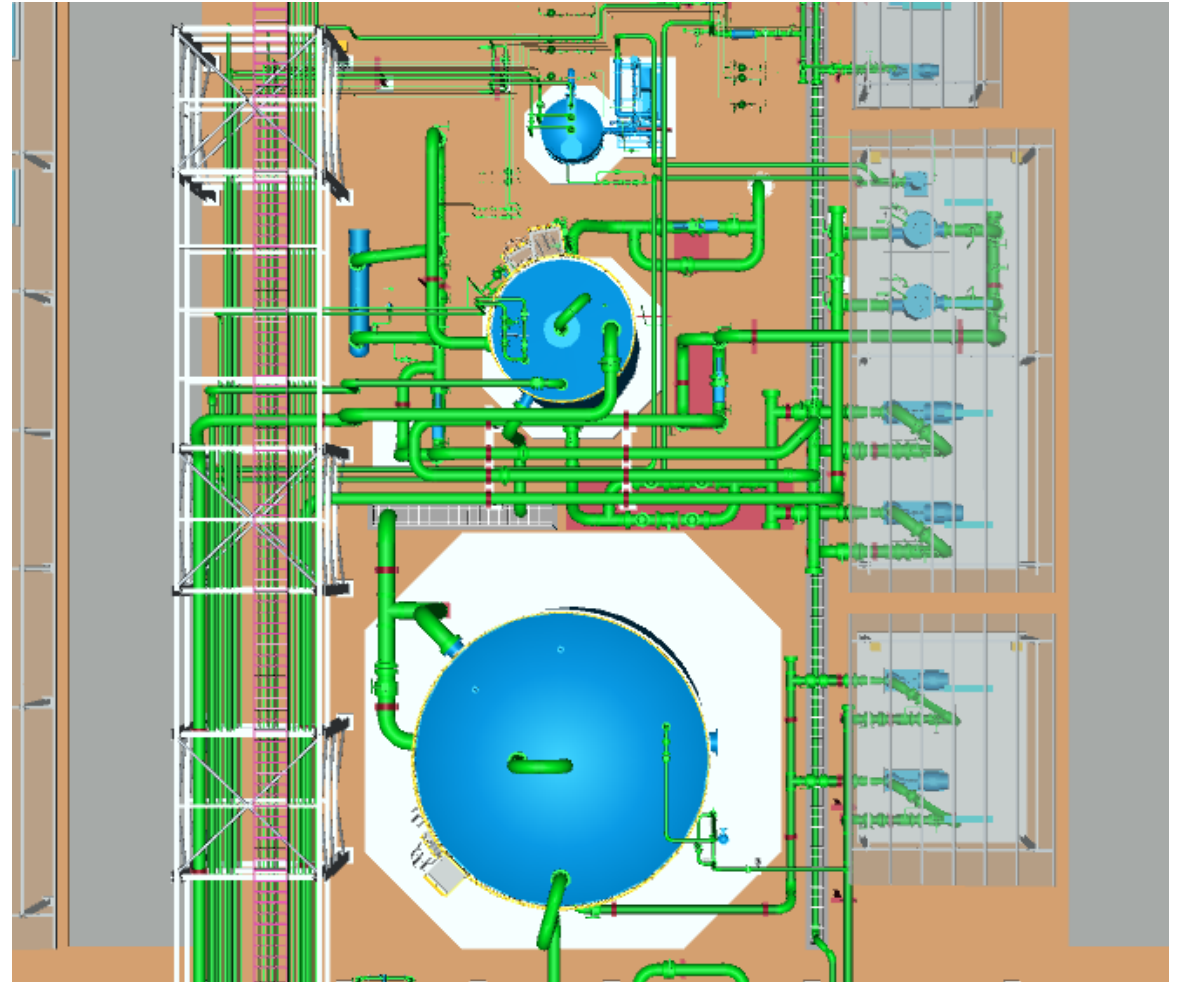


# Presenting AVEVA™ E3D Design

Features that lead to choosing AVEVA™ E3D:



Checking clashes between different disciplines, therefore checking the maintainability, operability, and accessibility of the project.



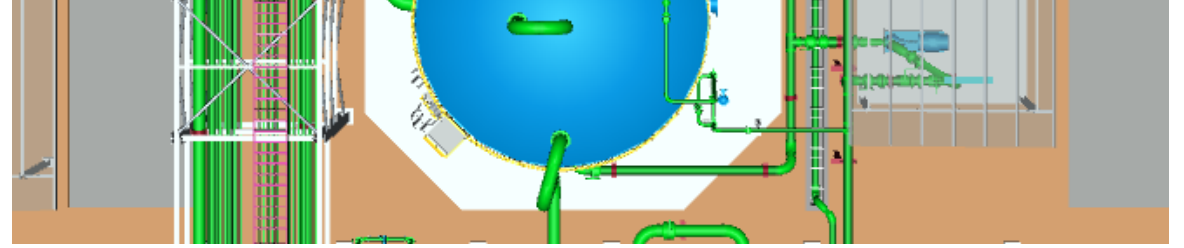


# Presenting AVEVA™ E3D Design

Features that lead to choosing AVEVA™ E3D:



Produce many output data for example (MTOs, Isometric drawings, orthographic drawings, pipe support drawings, and Reports).





# Implementing Drone Scans



A drone survey refers to the use of a Real Time Kinematic (RTK) drone, to capture aerial data with downward-facing sensors.

Drones can survey 500,000 sqm. within 40 minutes on-site and take 5 hr. process time at the office.

Drones can be equipped with different cameras or sensors based on the survey type and can gather data from above ground or underground

Thousands of images can be taken and processed in one drone flight

## Outputs:

3D model  
point cloud

Ortho-mosaic photo

Digital elevation  
model (DEM)

# Outputs of drone scans

**3D model  
point cloud**

**Ortho-mosaic photo**

**Digital elevation  
model (DEM)**



During a drone survey with an RGB camera, the ground is photographed several times from different angles, and each image is tagged with coordinates.

Photogrammetry combines images that contain the same point on the ground from multiple vantage points to yield detailed 2D and 3D maps.



# Outputs of drone scans

3D model  
point cloud

**Ortho-mosaic photo**

Digital elevation  
model (DEM)

A single photo is produced by processing thousands of images and therefore giving a high-resolution file with an accuracy of 5cm.





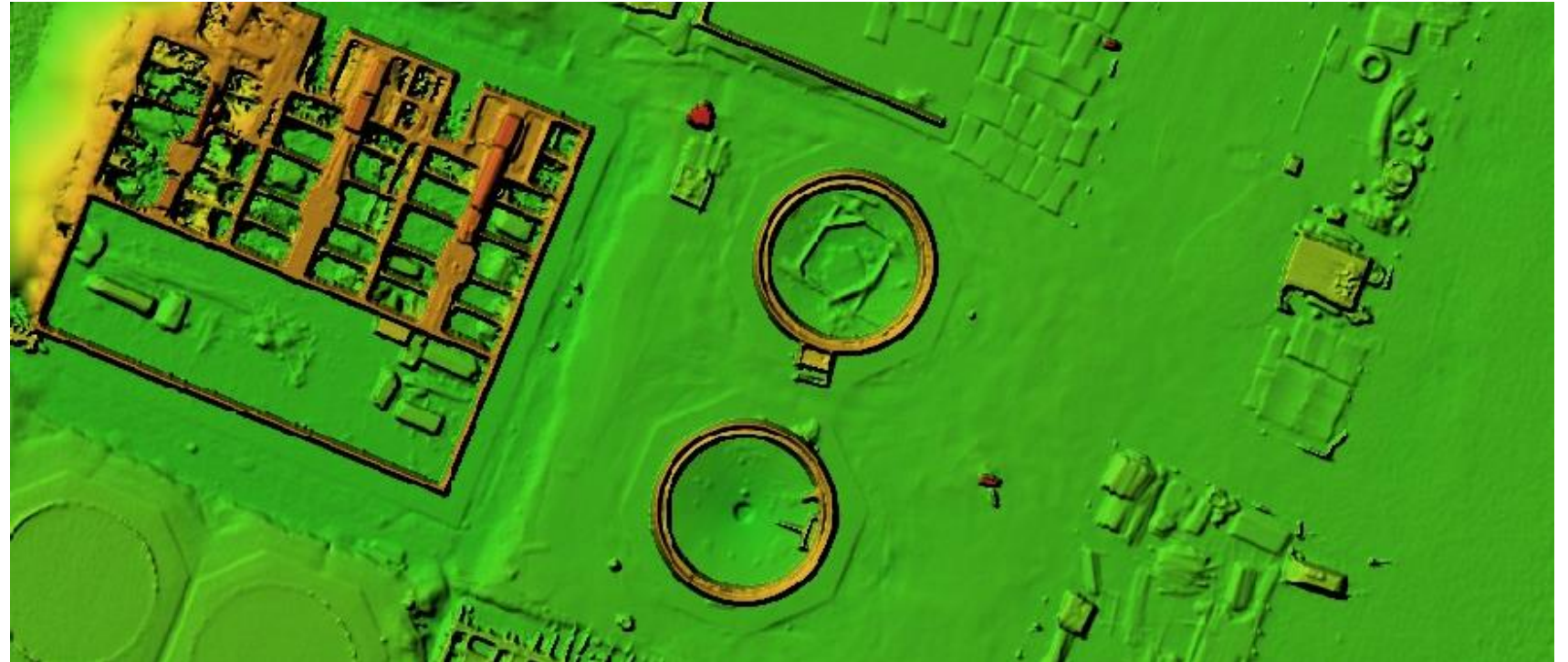
# Outputs of drone scans

3D model  
point cloud

Ortho-mosaic photo

**Digital elevation  
model (DEM)**

Used to create  
topographical surface  
drawings.



THE RESULTS:

---

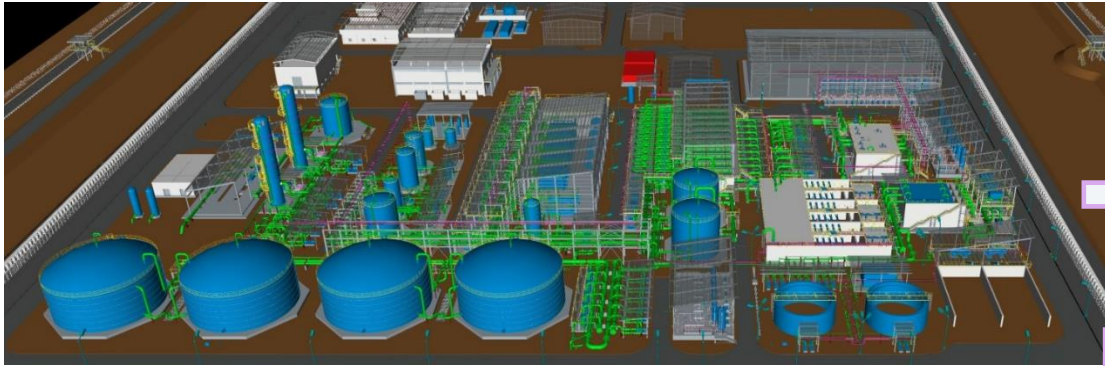
# Harnessing the Power of AVEVA™ E3D Design





# Unlocked Real-Time Construction Accuracy

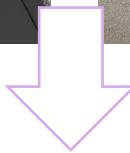
Merging both models from (AVEVA™ E3D) and (Drone Scans)



3D MODEL By AVEVA™ E3D



Actual Site Survey By Drone



Merging 3D Model + Actual Site Drone survey



# Unlocked Real-Time Construction Accuracy

Merging both models from (AVEVA™ E3D) and (Drone Scans)



Merging 3D Model + Actual Site Drone survey



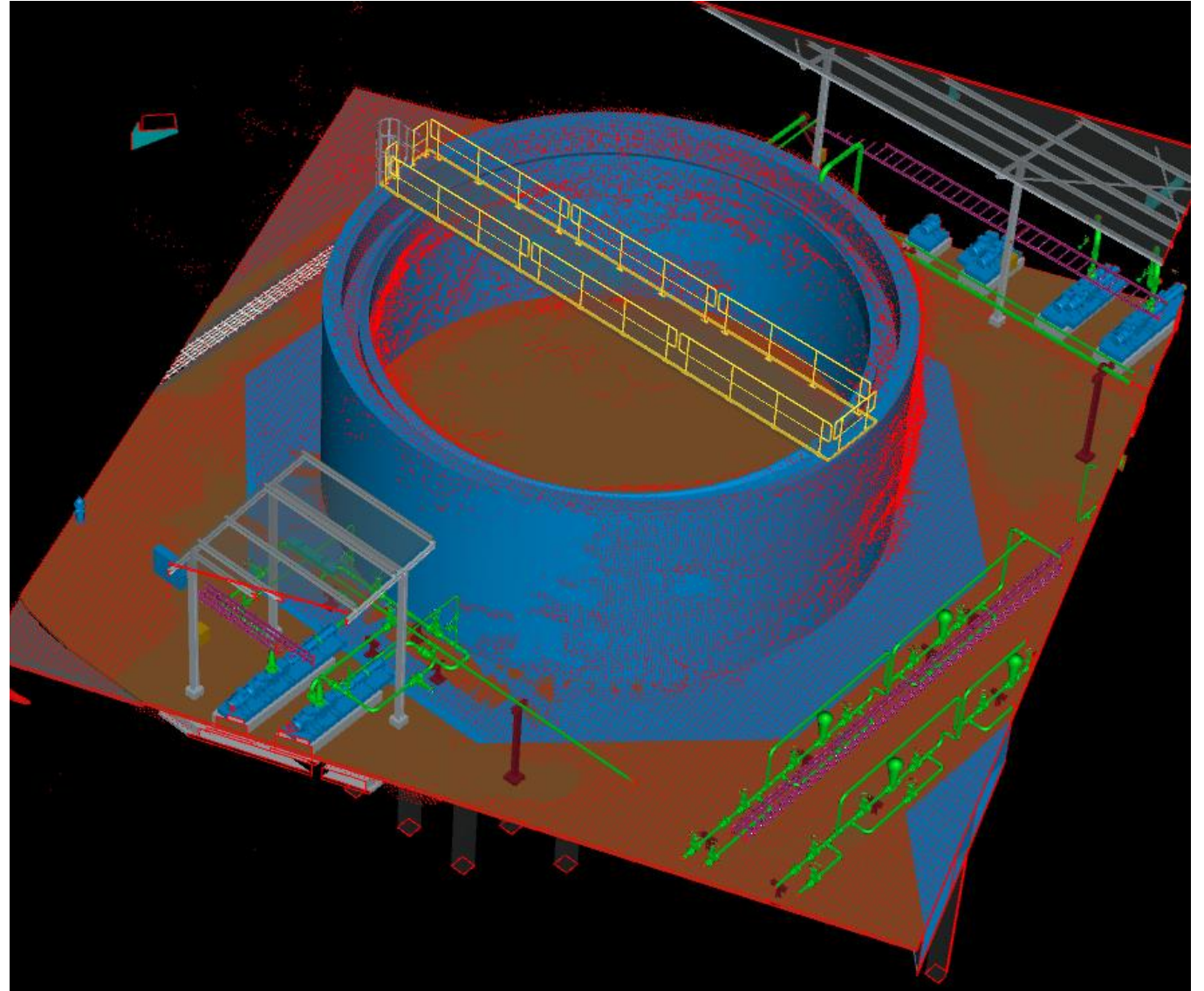
# Benefits

## Major Mistakes Avoided

The ability to check misalignments of civil activities online by comparing the scanned 3D model to the accurate AVEVA™ E3D model.



Showing Quality Check between the 3D Model and Drone Point Cloud





# Benefits

## A New Level of Monitoring

## Provided Exhaustive Data

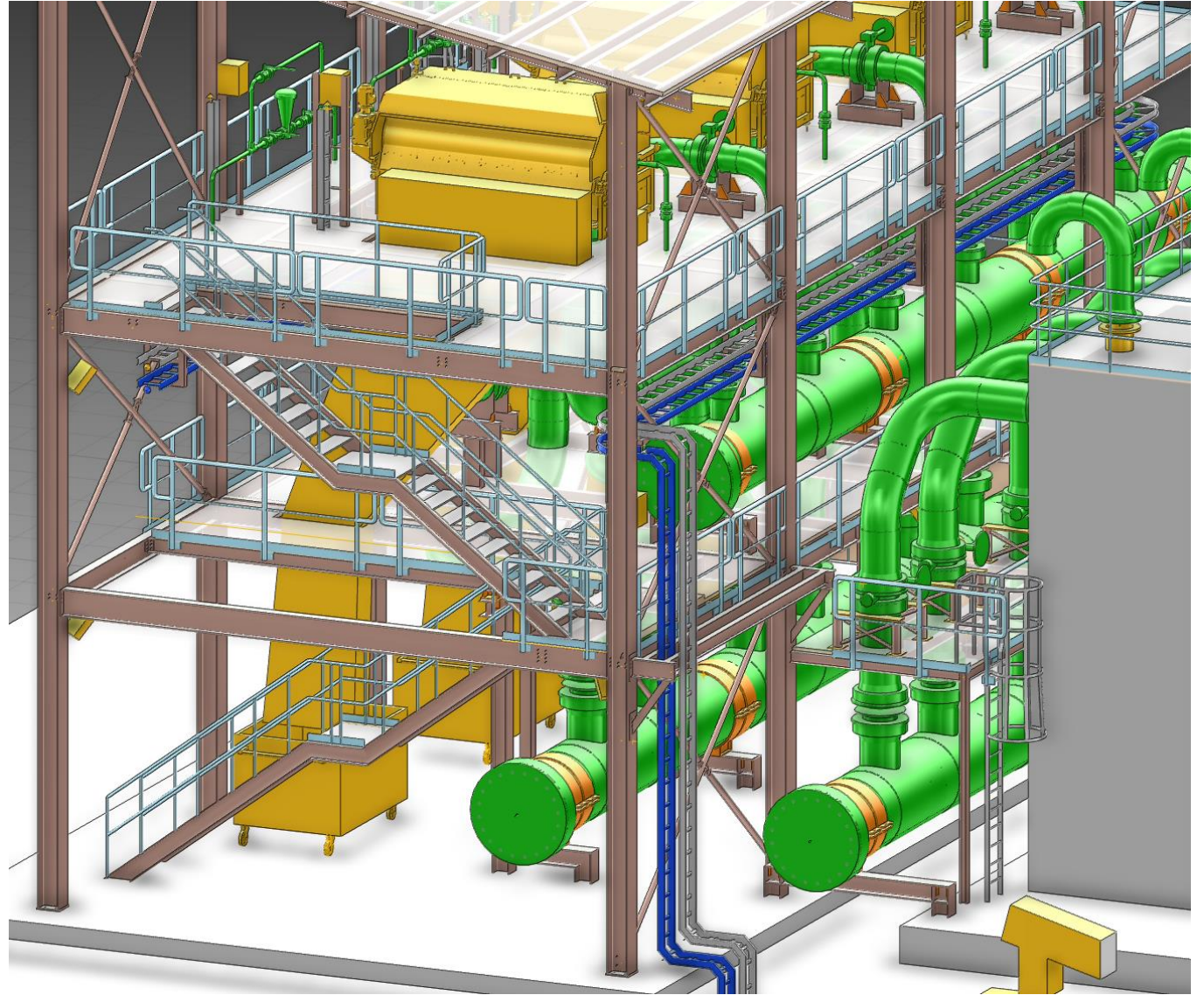
Each pixel of the produced map or point of the 3D model contains 3D geo-data which can be directly measured and compared to the AVEVA™ E3D model.



# Benefits

- A New Level of Monitoring
- Provided Exhaustive Data
- Cost Saving

Reduce the cost by saving the manpower usually used to implement this job using regular methods.





# Benefits

- A New Level of Monitoring
- Provided Exhaustive Data
- Cost Saving
- High Flexibility

No longer limited by unreachable areas, unsafe steep slopes, or harsh terrain unsuitable for traditional measuring tools.





# Benefits

- A New Level of Monitoring
- Provided Exhaustive Data
- Cost Saving
- High Flexibility
- Revolutionized Project Management

Bridging the gap between decision-makers and the project. Introducing unprecedented flexibility by centralizing all information, reshaping project management.



3D MODEL  
PRESENTATION VIDEO



AVEVA





EPC - MOD EXECUTIVE MANAGER

**HAQI HASAN**



## Water & Waste Water Treatment - Iraq

Delta River is driving unparalleled construction efficiency by bridging the gap between on-site activities and engineering designs.

### Challenge

- Engineering drawings coming 100% online from many sources around the world
- On-site construction team working in blistering 50-degree Celsius temperatures
- Stringent client standards
- Hundreds of people involved working from different locations.

### Solution

- AVEVA™ E3D Design emerged as the primary tool for visually presenting all project data. AVEVA™ E3D transformed the way data was handled, shared, and presented

### Results

- Risks of major construction mistakes went down to almost zero
- Transformed the project to a new level of accuracy
- Revolutionized the dynamics of online and offline discussions among diverse teams with varying engineering backgrounds and experiences
- The ability to pinpoint discrepancies between the two models







# Haqi Hasan

## Project Executive Manager

- Delta River
- [h.hasan@epc-mod.com](mailto:h.hasan@epc-mod.com)



# Ibtisam Al-Faris

## Architect - AVEVA E3D Modeler

- Delta River
- [ibtisam.jameel@epc-mod.com](mailto:ibtisam.jameel@epc-mod.com)

Project manager: Mouyad Sakban

3D Team:

Ibtisam Al-Faris - Hassan Al-Ogaidy – Mohammed Nahid – Ahmed Salim – Zahraa Fadhil – Zain Kadhim



# Questions?

Please wait for the microphone.  
State your name and company.



# Please remember to...

Navigate to this session in the mobile app to complete the survey.



# Thank you!



This presentation may include predictions, estimates, intentions, beliefs and other statements that are or may be construed as being forward-looking. While these forward-looking statements represent our current judgment on what the future holds, they are subject to risks and uncertainties that could result in actual outcomes differing materially from those projected in these statements. No statement contained herein constitutes a commitment by AVEVA to perform any particular action or to deliver any particular product or product features. Readers are cautioned not to place undue reliance on these forward-looking statements, which reflect our opinions only as of the date of this presentation.

The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.

 [linkedin.com/company/aveva](https://www.linkedin.com/company/aveva)

 [@avevagroup](https://twitter.com/avevagroup)

#### ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at [www.aveva.com](https://www.aveva.com)