



Drilling Contractors Association (DCA-Europe)

DUAL HDD INTO THE RHÔNE

PRECISION DRILLING IN A
CRITICAL ENVIRONMENT

Nicolas VAN HEYGHEN
François GANDARD

Founded in 2005

DCA member since 2022

Rehabilitation and creation of trenchless networks

Supporting companies looking for alternatives to open-trench work

500+ km trenchless networks installed to date



**Nicolas
VAN HEYGHEN**



Graduate in civil engineering

Specialised in trenchless projects

Over 20 years experience in microtunnelling & 8 in HDD



François GANDARD

Geotechnical and civil
engineer

28 years working in HDD

20 years on HDD jobsites

Founded in 2018

Trenchless studies, design, and
jobsite monitoring

Providing specialist expertise to
projects owners, project managers
and drilling contractors worldwide

350+ km crossings analysed





Post - Fukushima, a nuclear power plant in France needs to secure a lasting, cold water supply

Solution ?

Extract cool water from the bed of the nearby Rhône river, by HDD

Project overview

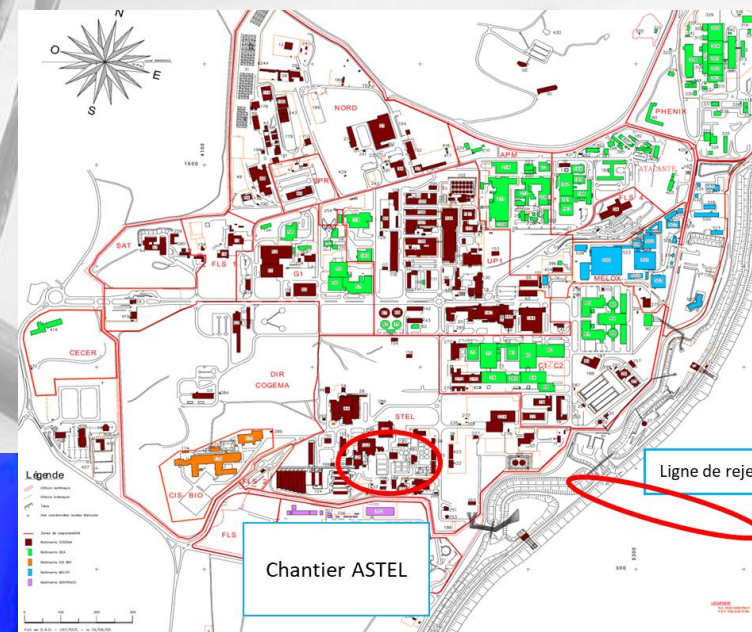
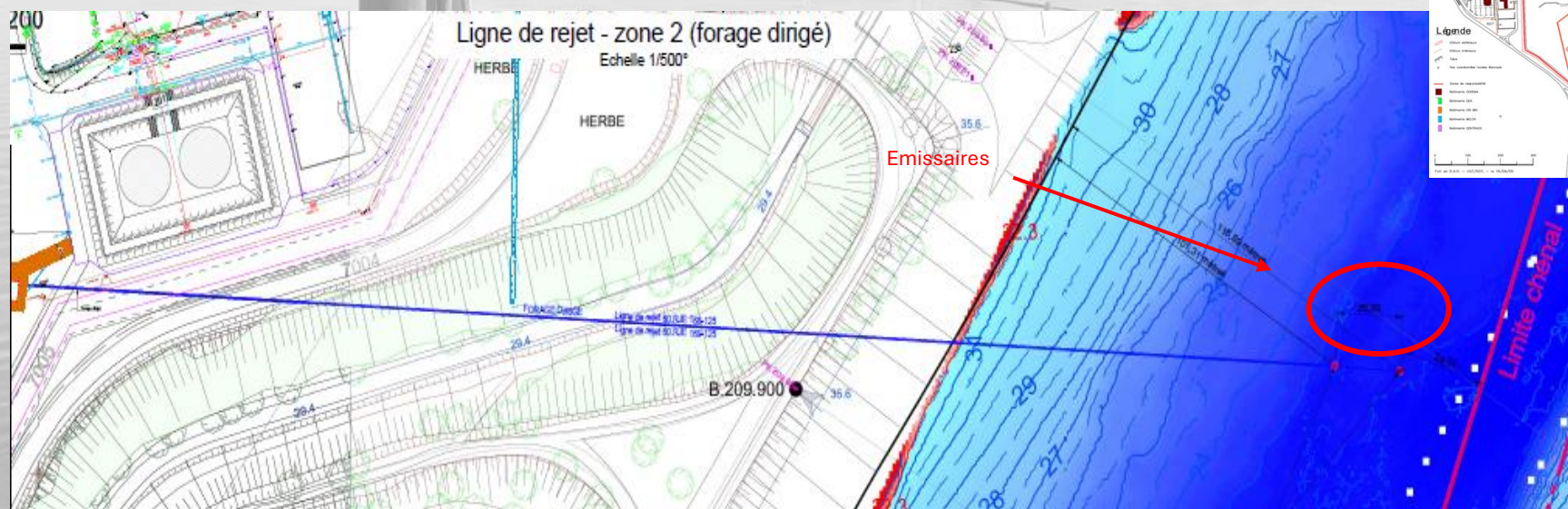


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SUBTERRA PRÉSENTE

Project location



Constraints



The river

200m wide waterway

13m deep

Flow rate of $1800\text{m}^3/\text{s}$
($1,3\text{m}/\text{s}$)



Shipping lane

60m wide shipping lane

Freight & leisure boats

Obligation to keep
open 24/7



Red tape

Regulations +++
for the nuclear sector

River straddling two
administrative regions

Project history

A thick orange arrow points vertically downwards, indicating the chronological flow of the project history.

2014 – 2015

Tender consultation

No interest from major drilling contractors

SUBTERRA bids, despite little landfall experience

2016 – 2020

Contract negotiations & signature

Authorities put project on hold

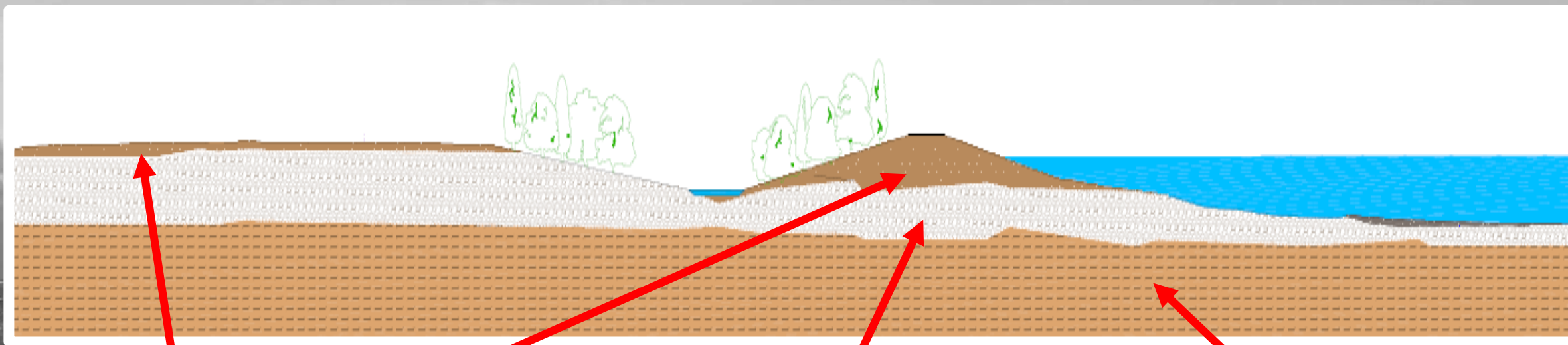
2020 – 2023

NVH joins SUBTERRA

SUBTERRA carries out extensive ground surveys

Mandates OPTIMUM for its HDD expertise and support

Jobsite conditions

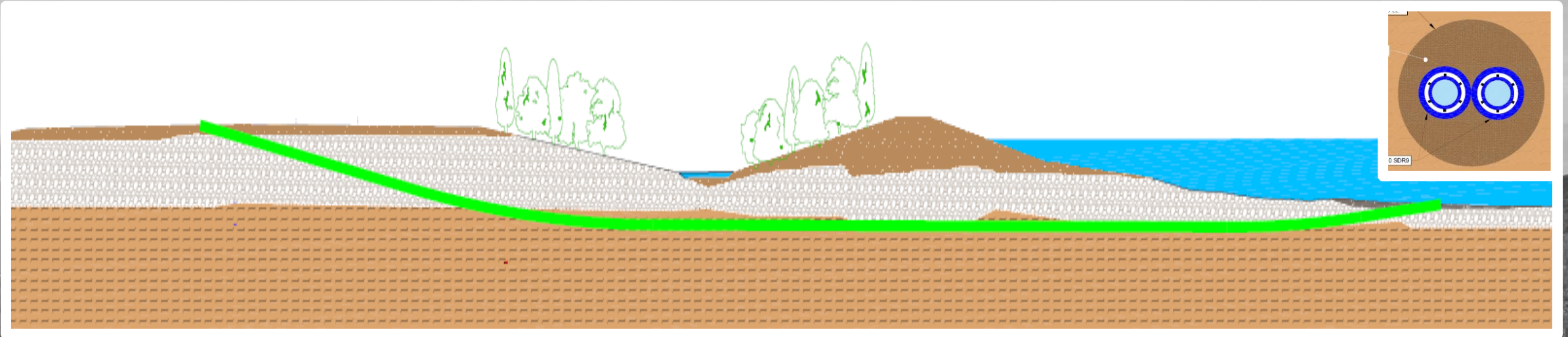


Backfill

Blocks / Cobbles

Clayey marl

2015 Tender design

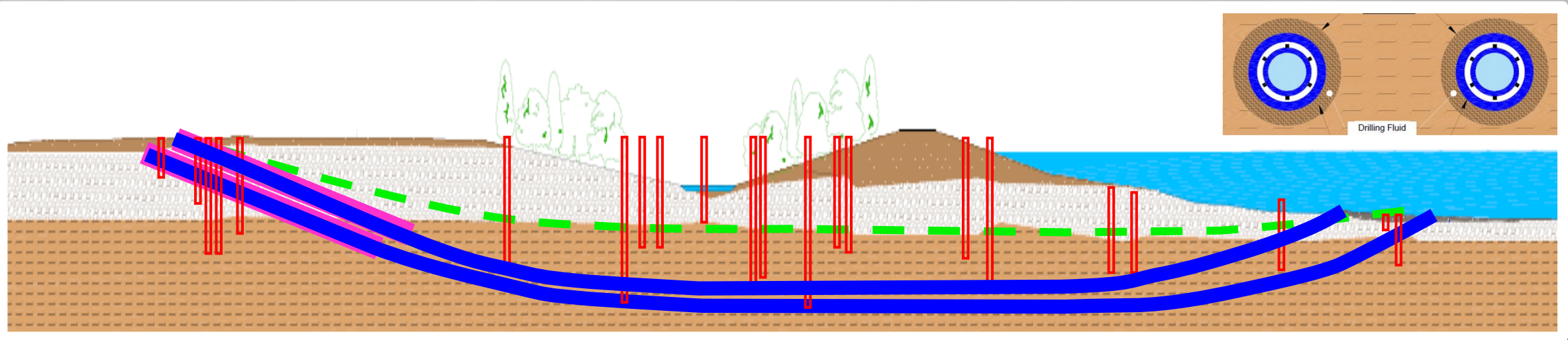


**No soil survey
information
supplied at time
of tender**

**HDD length : 450m
More clearance in
front of the river**

**A single drill with
22" reaming
All drill path in / near
blocks**

OPTIMUM re-design



**Existing data
recovered**

**Additional soil
surveys carried out**

Two parallel drills

No reaming

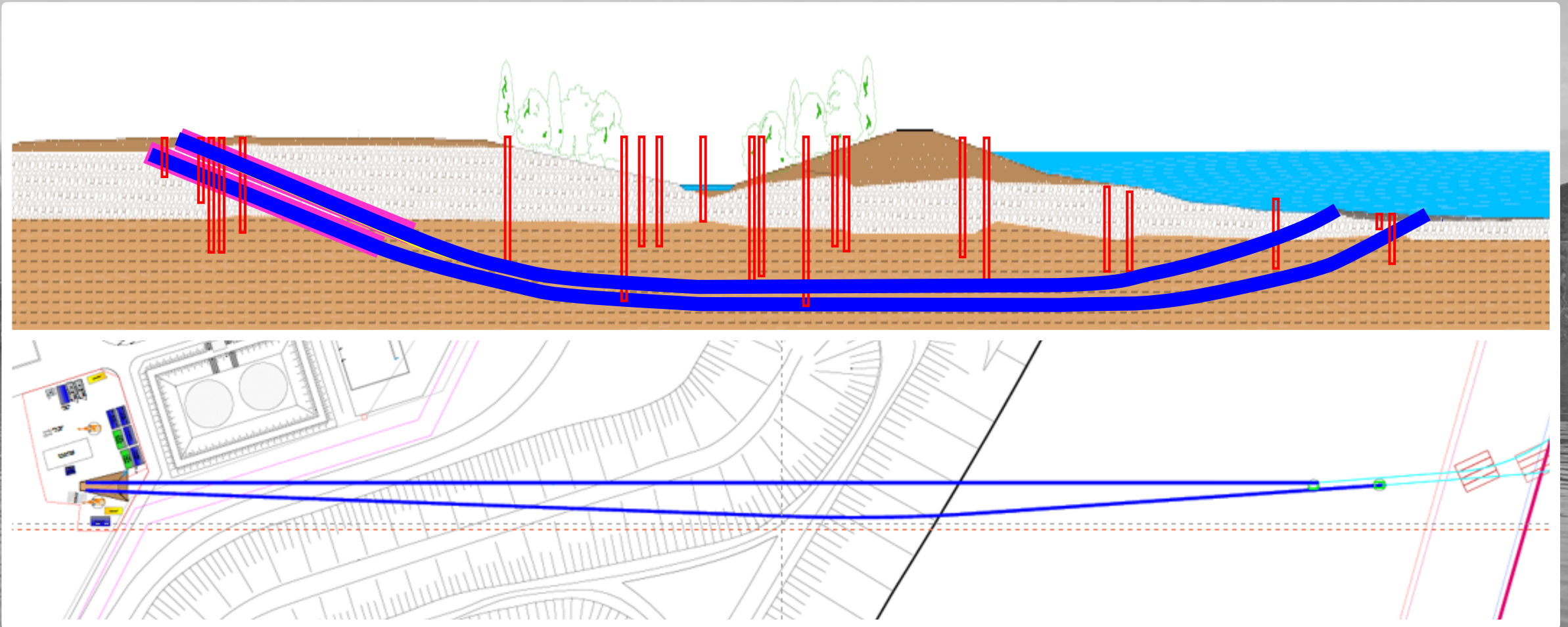
**Limit drilling in
pebbles to secure
the exit**

Use a casing

**Go straight to the
marl**

Drill deeper

OPTIMUM re-design



Connection and pullback

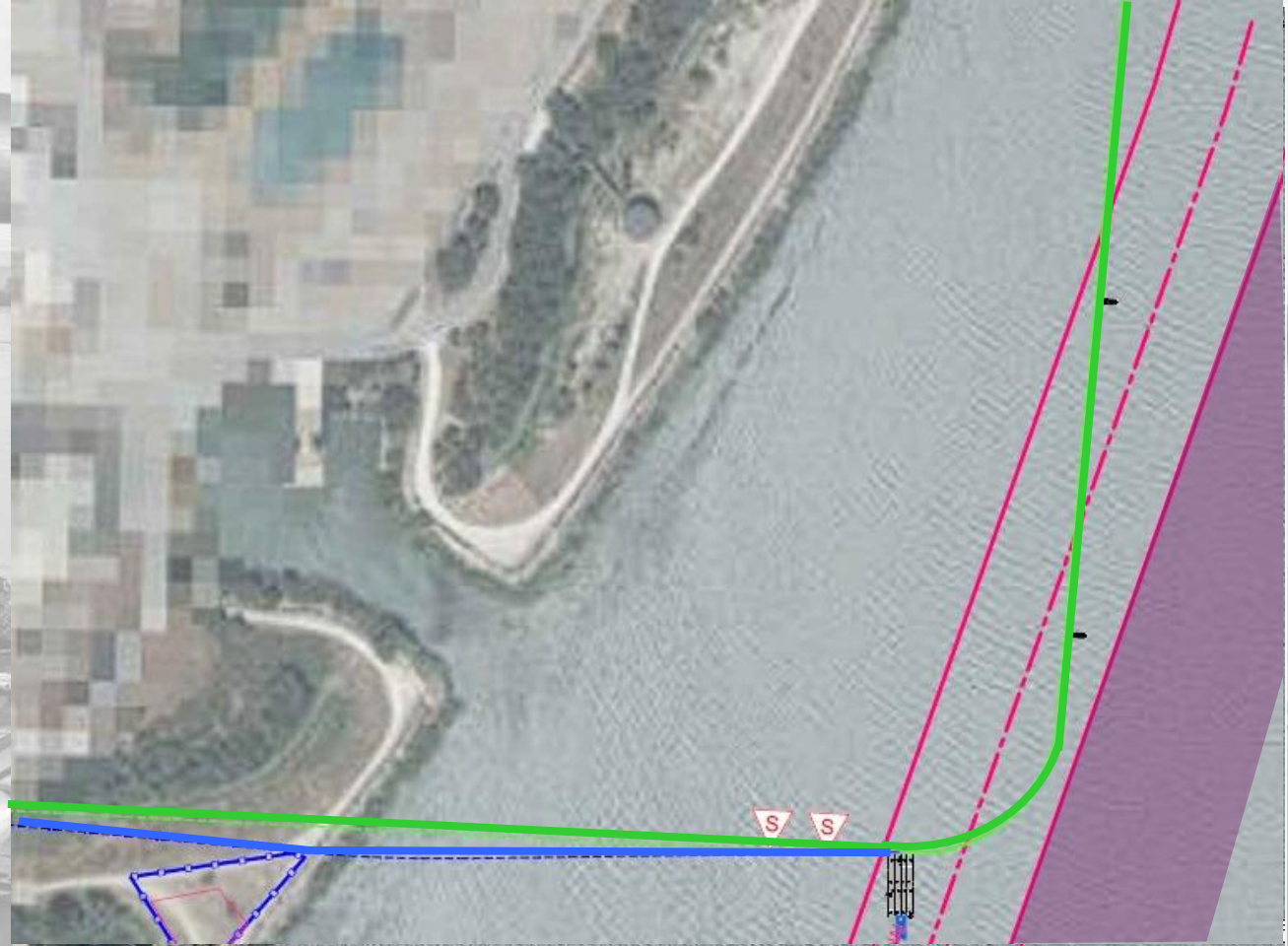
Shipping lanes in use 24/7

Negotiate a temporary shipping lane relocation

Launch the pipes up-river

Connect and pullback

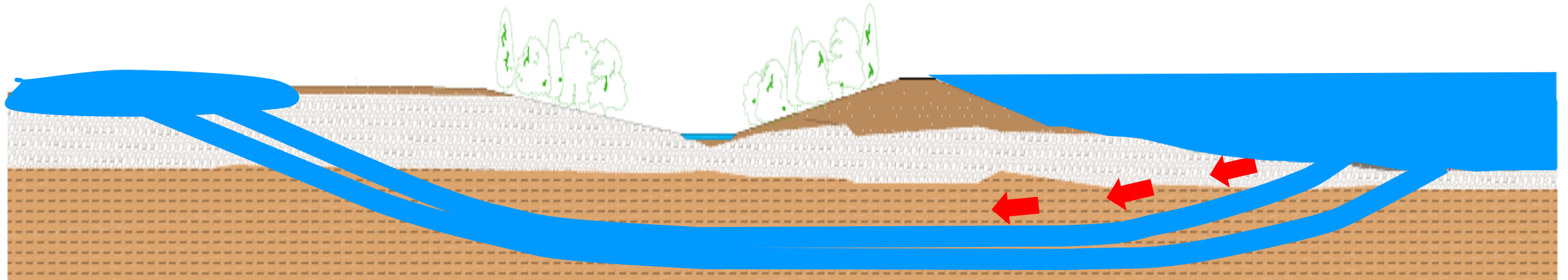
Mooring boat to stabilise the pontoon



Challenge #1 : Protecting the dike

Problem ?

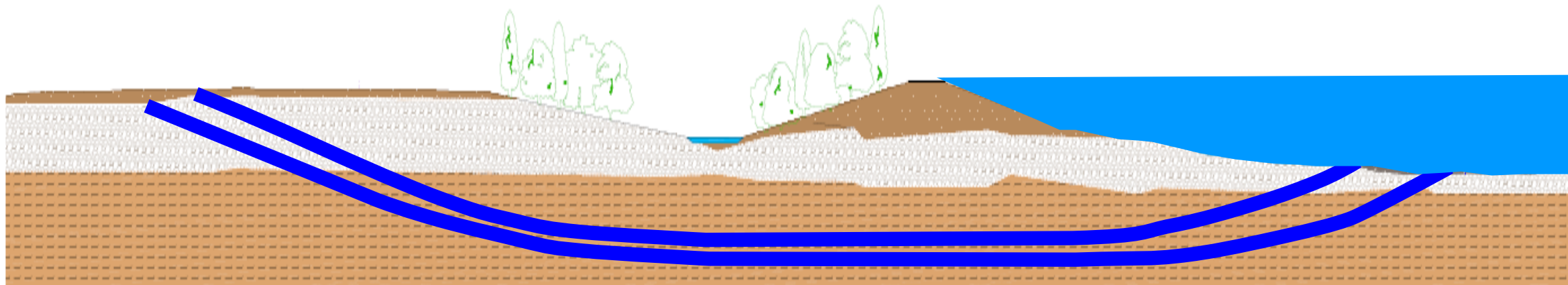
If river rises, annular space could become a conduit and flood the plant



Challenge #1 : Protecting the dike

Solution ?

Use a drill grout during pullback

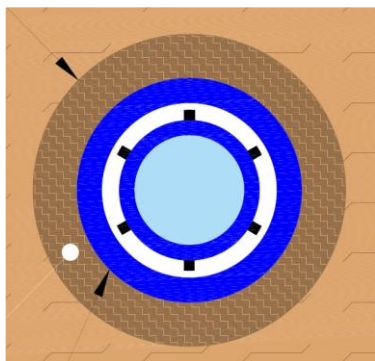
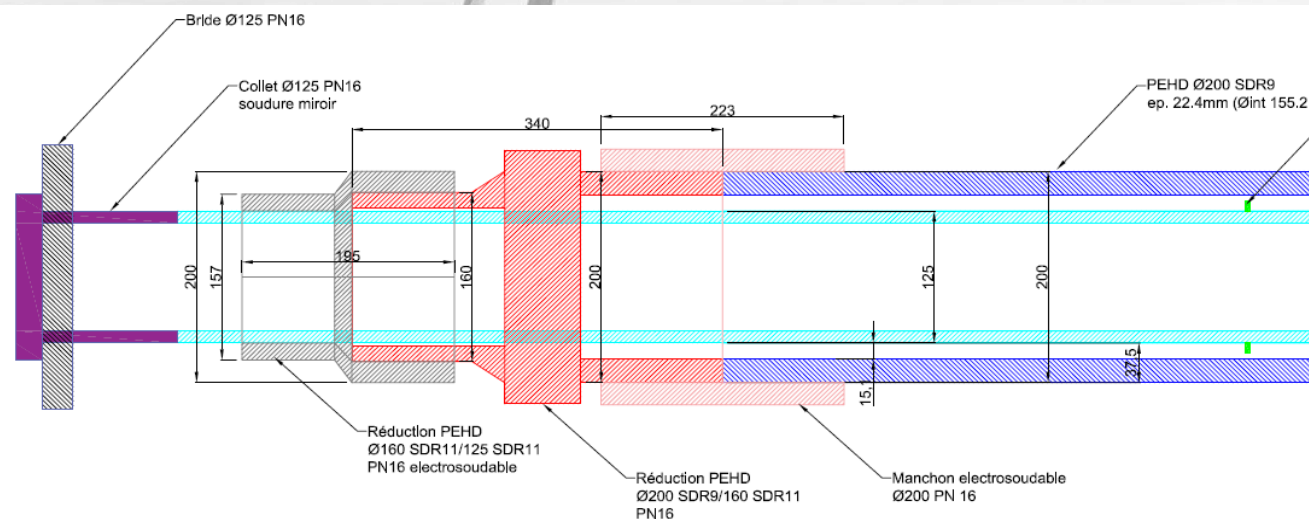


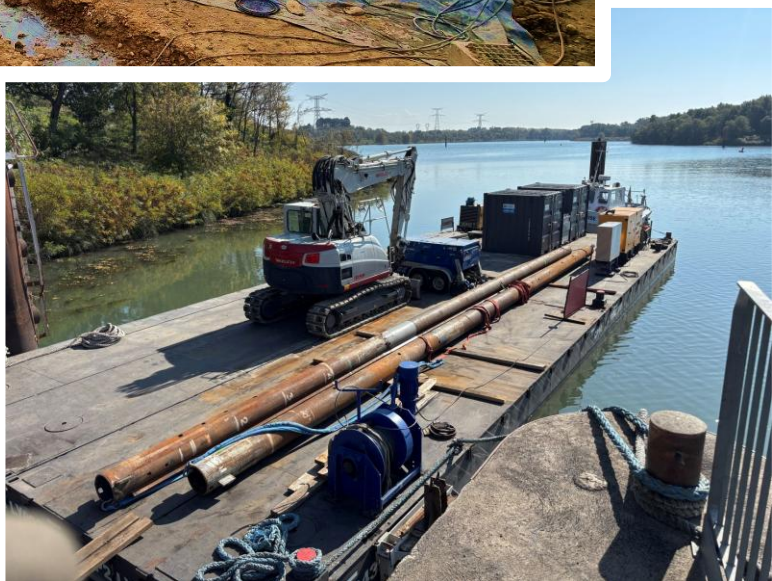
Challenge #2 : Pipeline pressure control

Solution ?

River-side : Watertight HDPE sealing cone between Ø200 and Ø125.

Land side : Sealing cone, equipped with 1" port and pressure gauge





Drill rig : PD80/40

Drilling tools : 6³/₄" mud motor,
9⁷/₈" milled tooth drill bit

Steering : Paratrak + gyroscope by Prime

Nearshore : 120m² pontoon, tugboat,
diving team

Onsite – at last !

It's never all plain sailing ...



Pullback ...

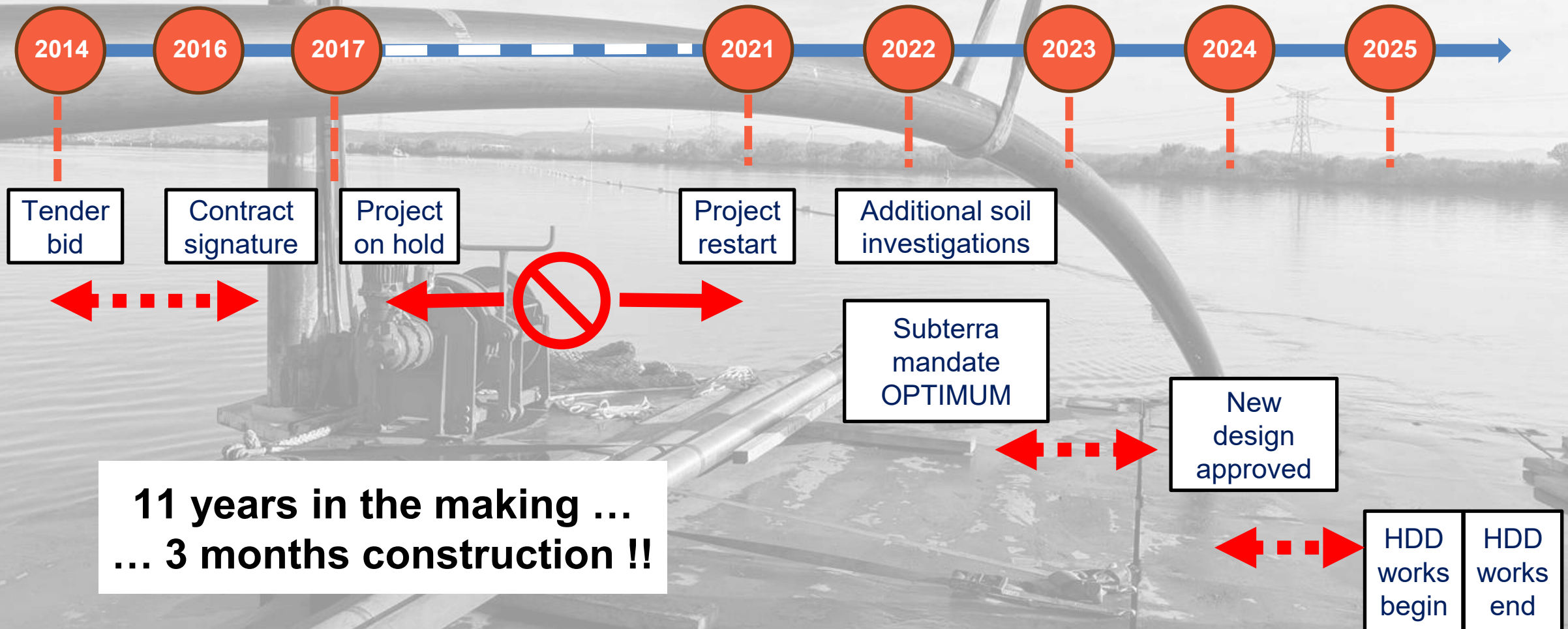
Floods and tree trunks !!

Connection ...

Where did the pipes go ??



Project timeline

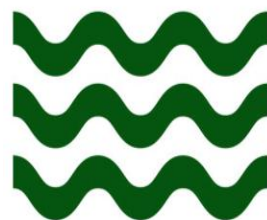


Lessons learned



PRIORITIES

What is important to you, isn't always to the Project Owner



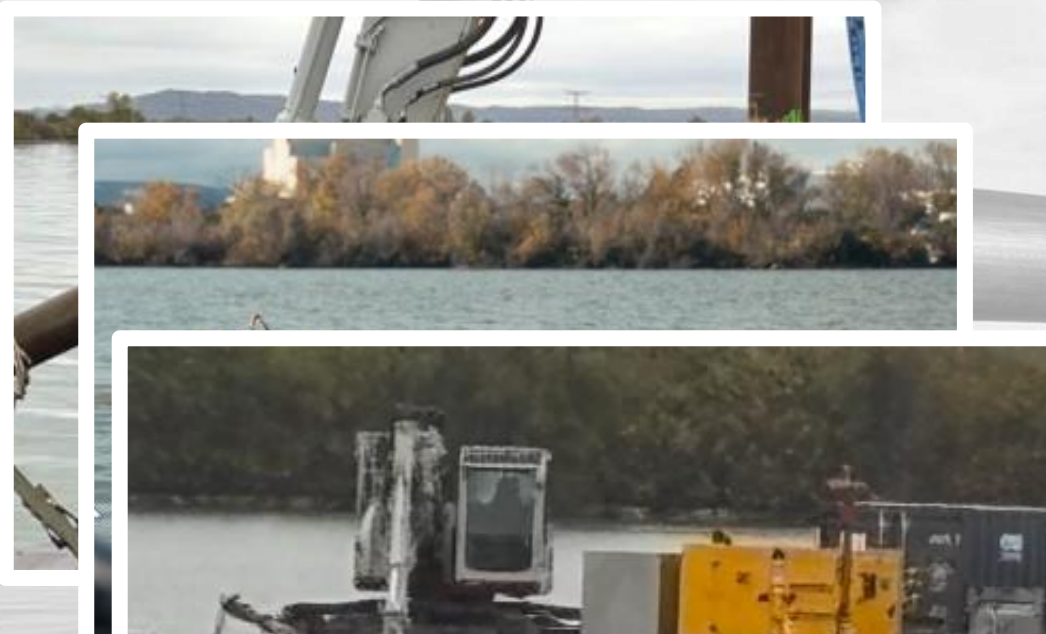
ALL CHANGE !!

When water is involved, the driller is no longer in control

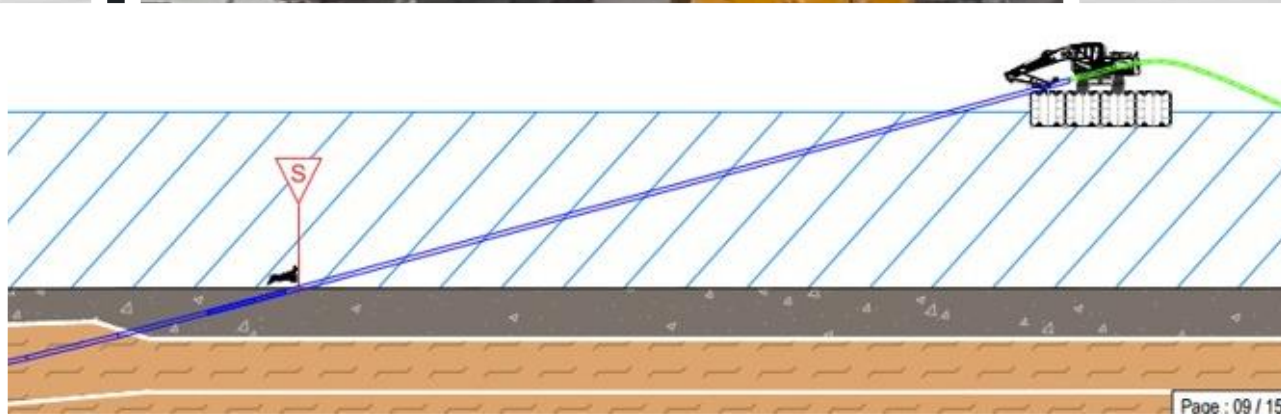


LOCATION DATA

Always use a GPS tracker - pipes move in strong currents



Locating and recovering the drill head
Lifting up the drill string
Managing buoyancy during recovery
Pulling back the HDPE pipe



River operations

Never forget !!



BOULDERS

Drilling – and especially reaming – has never and will never work !!



SPECIALIST HELP

Engineering by HDD specialists ensures a project is workable



PREPARATION

Good preparation beforehand makes for success onsite



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