Thermal Desorption of VHOC Contaminated Soil and Vapor Management at Lucciana, France

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OVERVIEW


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1 Company overview & technology principle

HT TODAY – TECHNOLOGY PROVIDER

Own Lab and R&D facility

Based in Brussels (Belgium)
55 peoples

Worldwide Operations

Own Smart Burners™ manufacturing facility

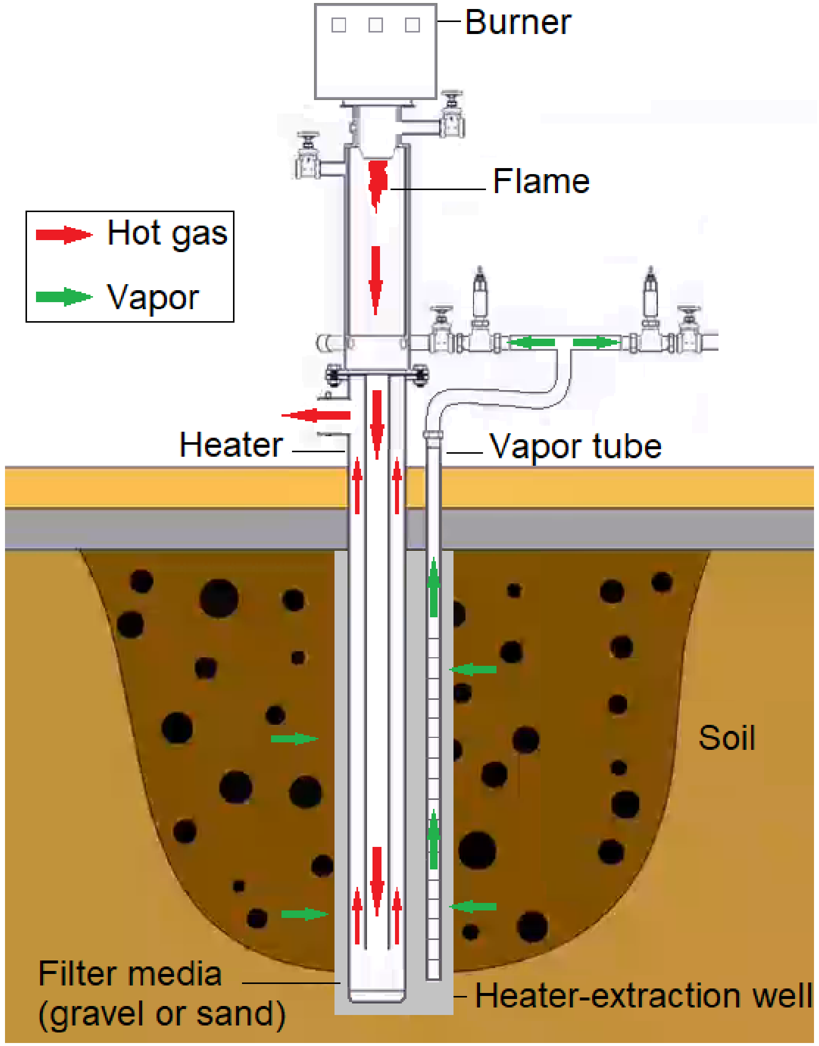
25+ Years in Business

THEY TRUSTED US

Rio Tinto Alcan
VINCI
Englobe
eni
ICARO ecology
践行中欧科技服务有限公司 Vision and Action
FLI
ARKIL
EIFFAGE
Wallonie service public SPW
ExxonMobil
SAMEN MAKEN WE MORGEN MOOIER OVAM
Celtic
DERBIGUM
enGlobe
PARIS
LINGENHELD GROUPE
Ford
ARCADIS
CARMEUSE
SLA SINGAPORE LAND AUTHORITY
3suisses
BNP PARIBAS
PERENCO
STRABAG
Remea
spie batignolles
SADEV 94
AECOM
SIMAM GRUPPO acea
Petroltecnica TERRA THERAPY
KBC
EVONIK INDUSTRIES
TETRA TECH
ORTEC GROUPE
TotalEnergies
LDD NEOPHARM GROUP
Séché environnement Séché global solutions
BAYER
SOCIALIST REPUBLIC OF VIETNAM MINISTRY OF NATIONAL DEFENCE
RSK
GOLDER
RÉGION DE BRUXELLES-CAPITALE
REGION H The Capital Region of Denmark
Haemers technologies

OPERATIONS WORLDWIDE WITH LOCAL PARTNERS

HEATING SYSTEM - TCH



1

HEATING THE SOIL

Objective : Vaporise contaminants

2

RECOVER CONTAMINANTS

Extract from soil all vaporised contaminants

3

TREAT THE CONTAMINANTS

As fuel (in the burners) or
as liquid product (after condensation)

2 Site description & Approach

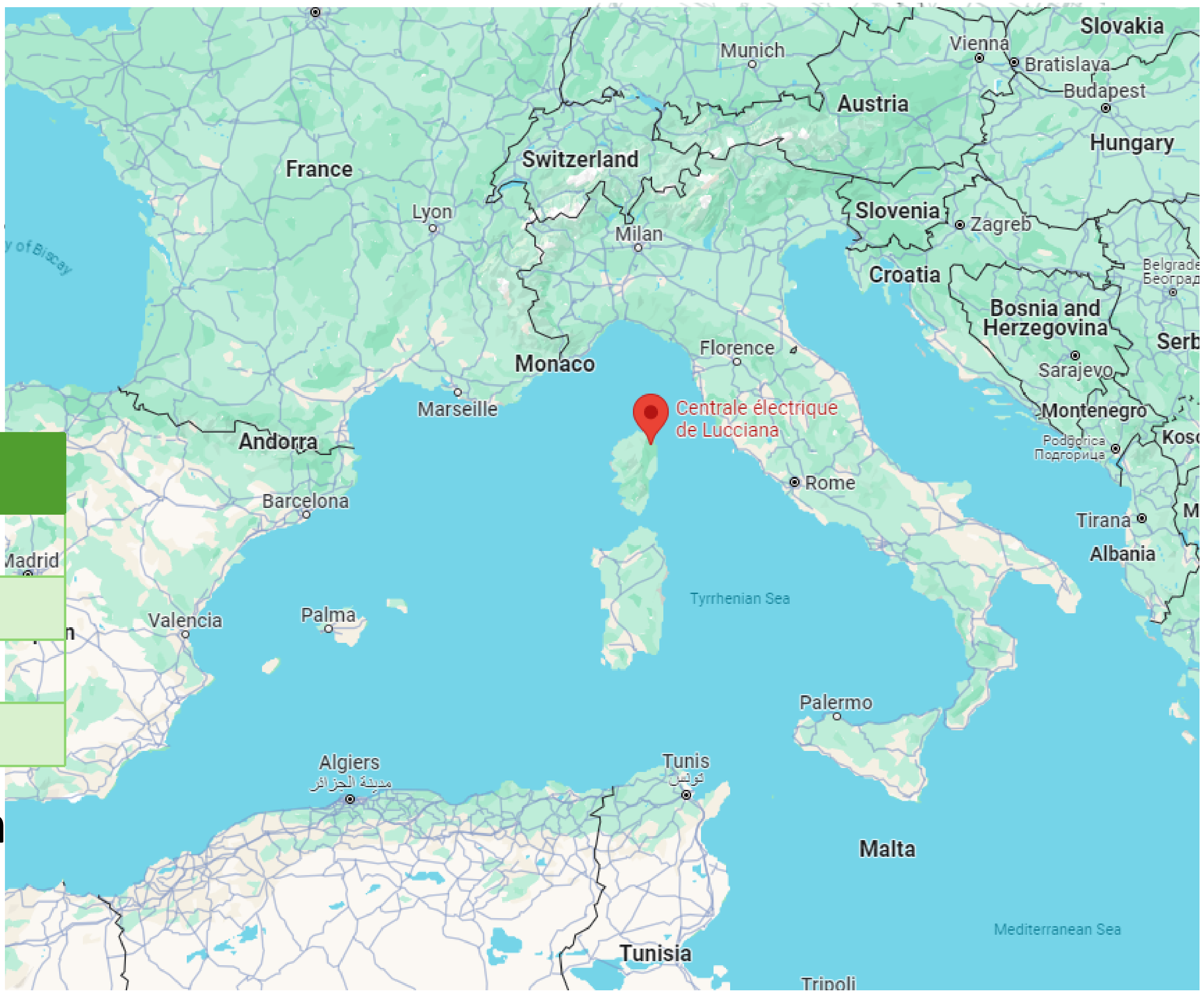
Site description & stakeholders

- Client: EDF (Electricité de France)

- Site characterization: 2 impacted are
in soil gas (> 20,000 µg/yd³)
VHOC contamination (up to 730,000 µg/yd³
1,1-DCA and 340,000 µg/yd³ of 1,1,1-TCA)

Description	Quantity	Unit
GW Depth	> 50	ft
Upper depth (ISTD)	16	ft
Lower depth (ISTD)	43	ft
Area	43,000	ft²

- Lithology : Sand/silty/clayey soil with
multi-decimeter bloc



Multi Approach Design

- Soil Gas Treatment (vadose area)

  In-Situ TCH for hot spot (> 80,000 µg/yd³)

  Venting for peripheral zone (20,000 – 80,000 µg/yd³)

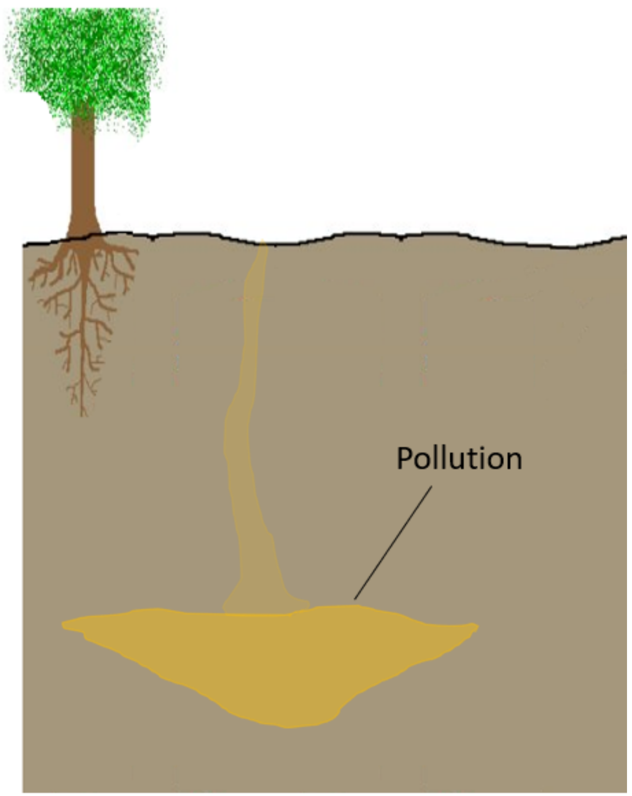
- Groundwater Treatment (saturated area)

  Pump & treat (collect of pure product and lowering groundwater)

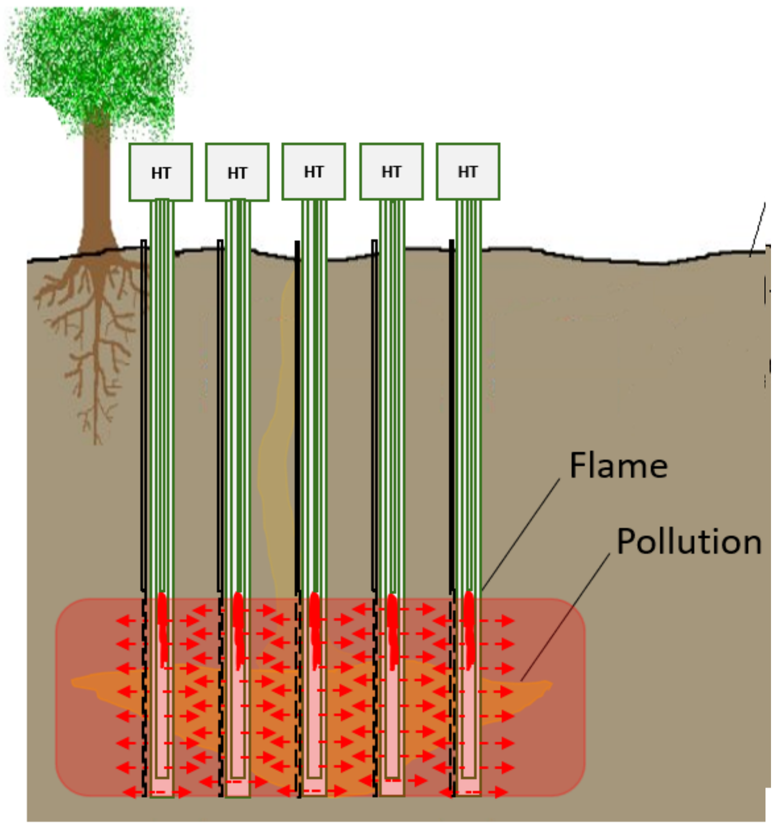
  Sparging

  In-Situ Chemical Oxidation after total treatment

In-Situ TCH – Remote flame technology

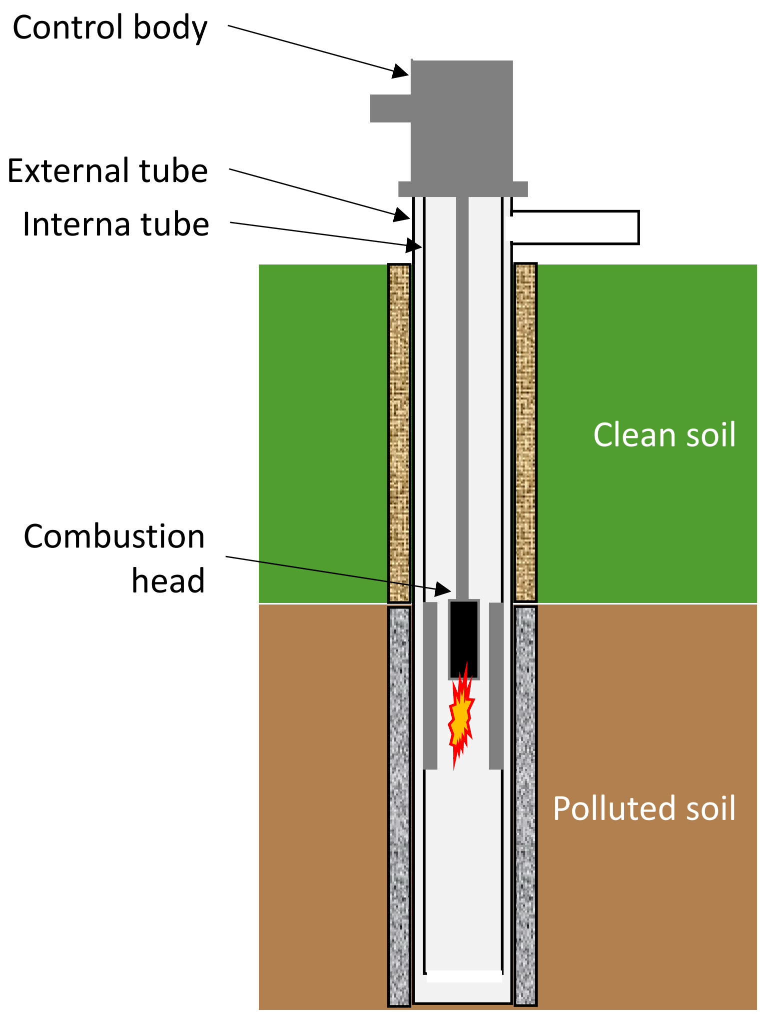


Without remediation



With classic STD burners

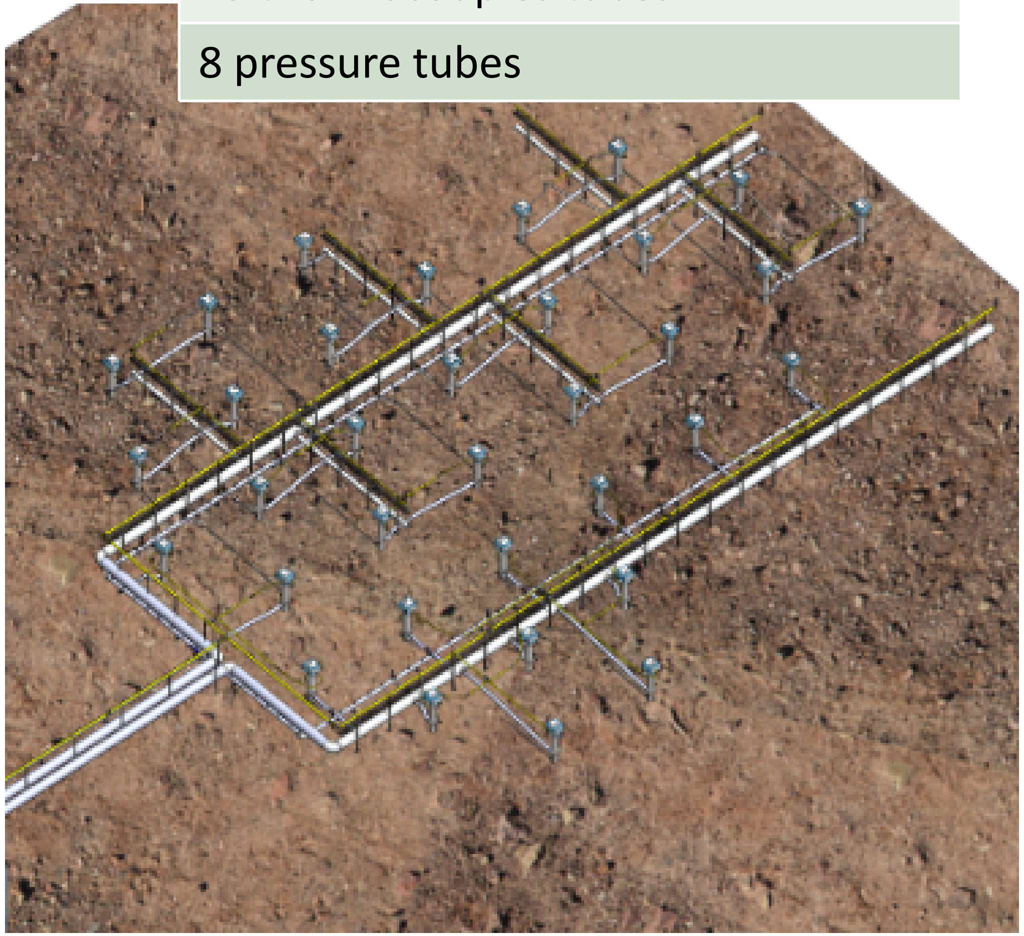
With Remote flame



3 TCH design and results

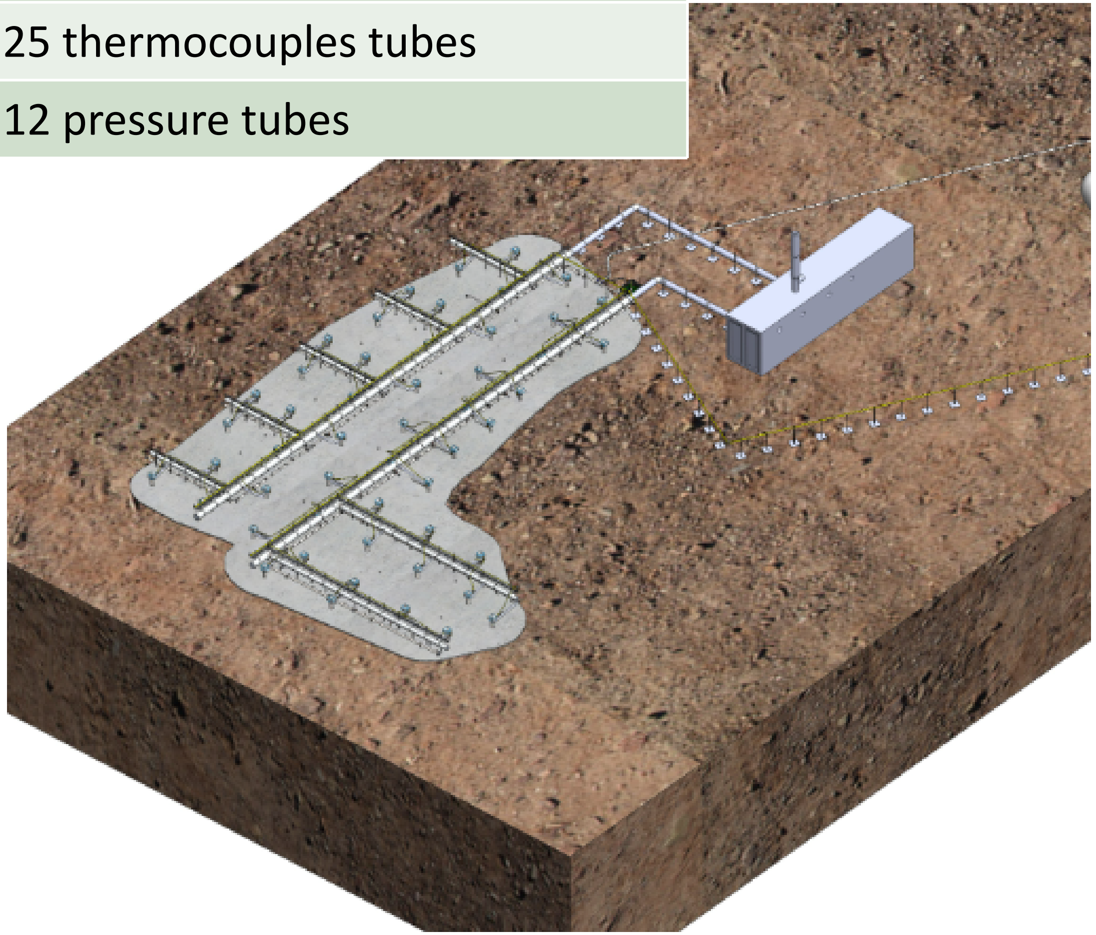
Batch 1 – Design & fuel consumption

Description
36 remote flame burners
15 thermocouples tubes
8 pressure tubes



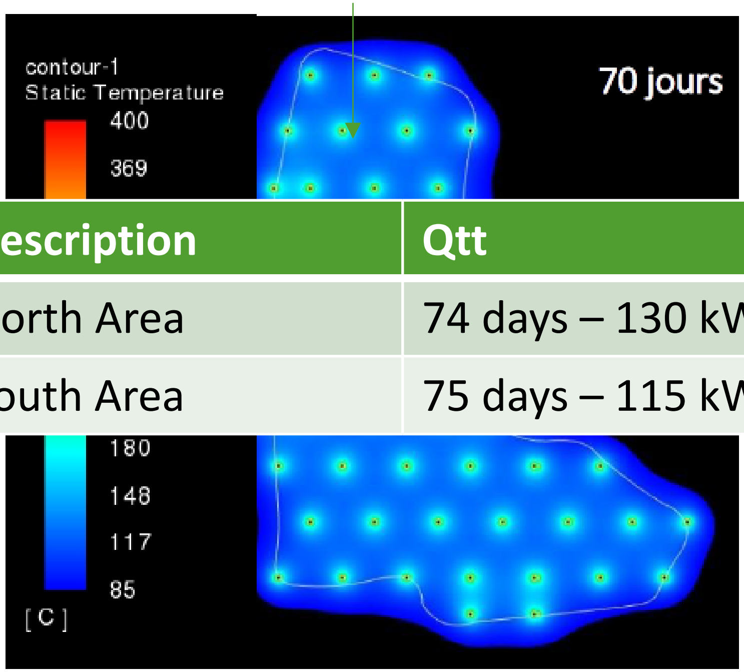
Batch 2 – Design & fuel consumption

Description
51 remote flame burners
25 thermocouples tubes
12 pressure tubes

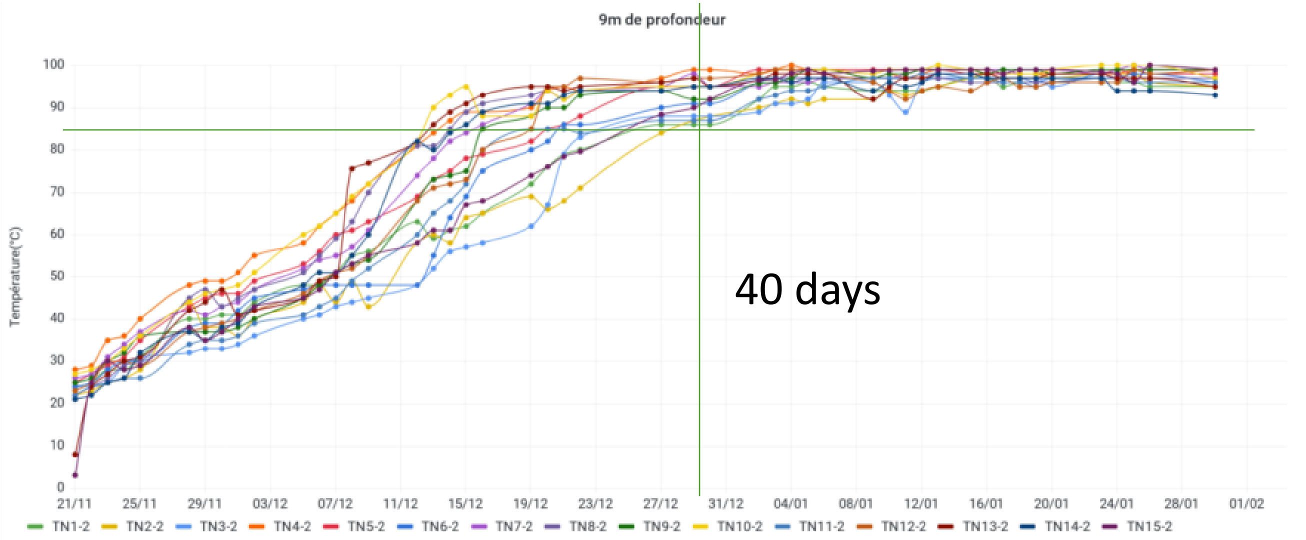


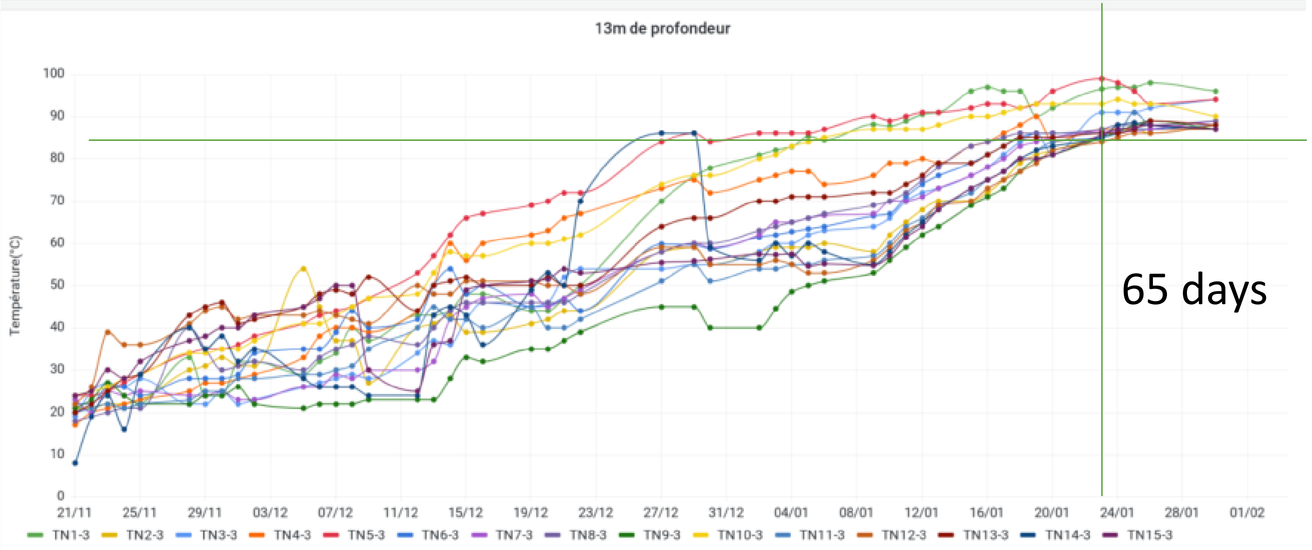
In-Situ TCH – Heating phase

Description	Qtt
Target kinetic	85°C – 5 days at TT
Fluent Simulation	70 days

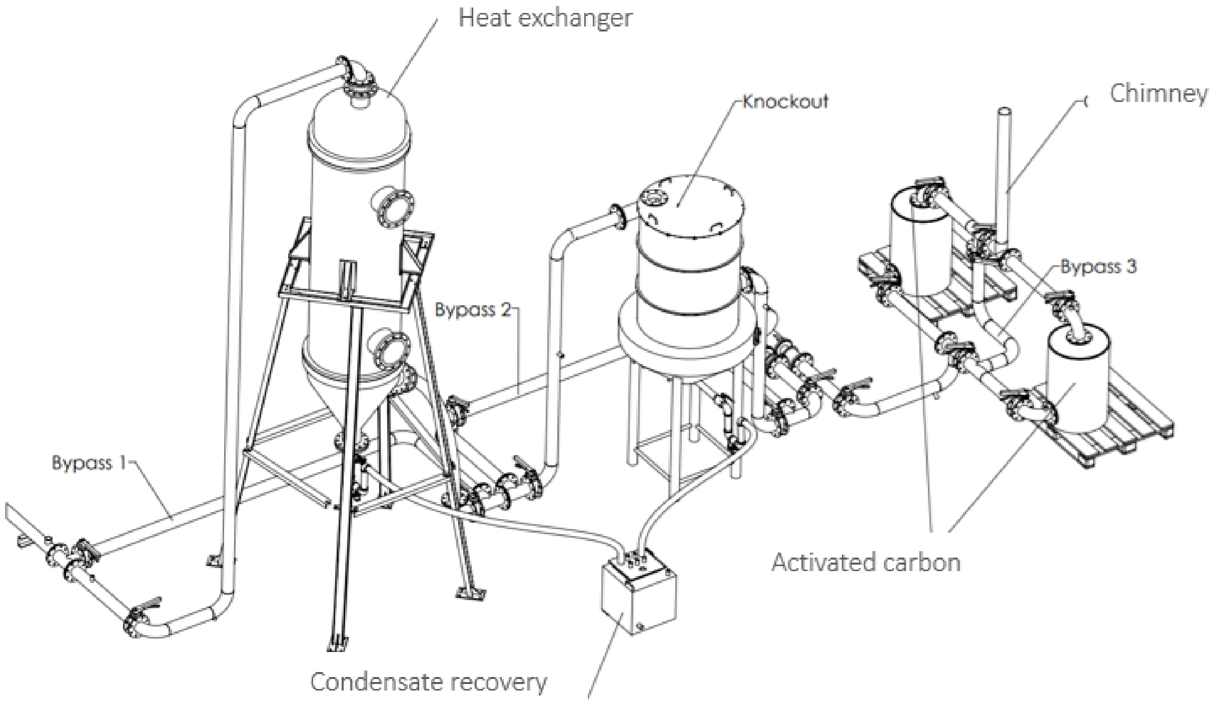


Description	Qtt
North Area	74 days – 130 kWh/t
South Area	75 days – 115 kWh/t

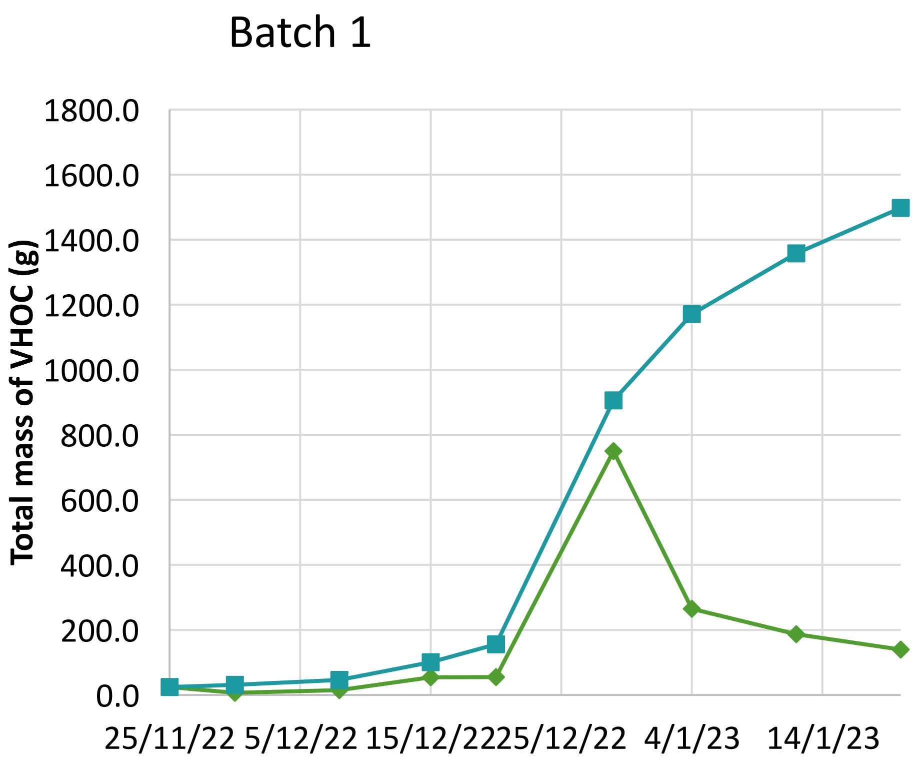




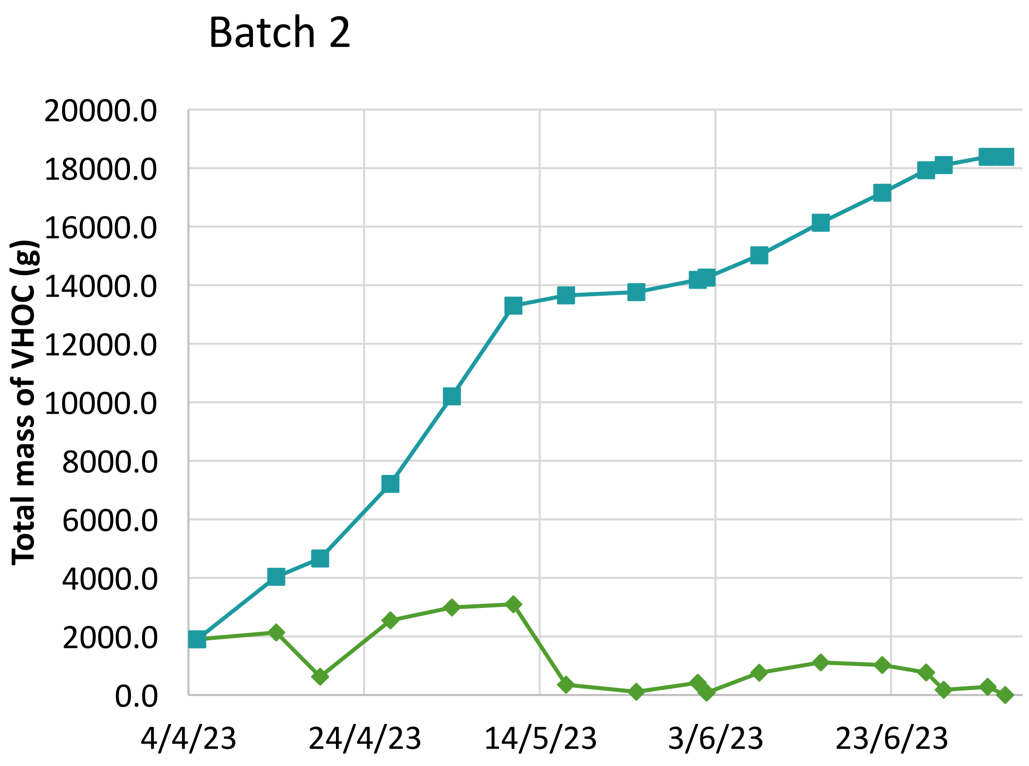
Design – Vapor Treatment Unit



Results



Final average concentration	25 µg/yd³



Final average concentration	1,500 µg/yd³

Synergies with TCH

- Improved the efficiency of the venting at the boundaries
- Improved the efficiency of the chemical oxidation (injection at 40°C)

4 Conclusion

CONCLUSION

- Complex site
- Multi technology approach
- TCH as backbone (synergies with venting and chemical oxidation)
- Scalable and predictable technology (70 days in the simulation and during operations)
- Low recovery mass in the VTU due to the presence of venting VTU

Thank you for your attention !