

Overview of the Modern2020 EC-project dedicated to monitoring of a radwaste repository

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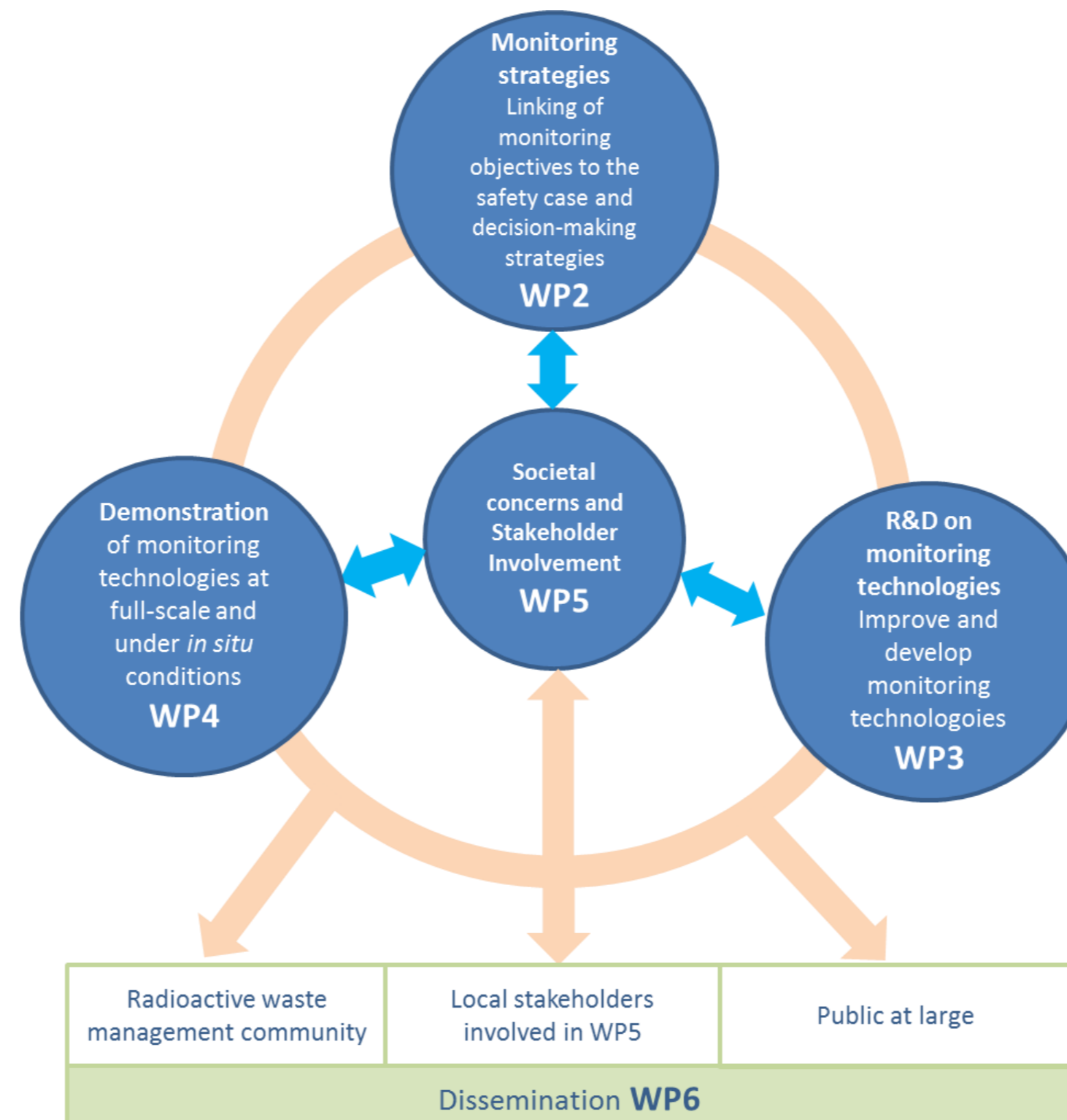
Modern2020 overall objective: provide the means for developing and implementing an effective and efficient repository operational monitoring programme, taking into account the requirements of specific national programmes.

Modern2020 will focus on monitoring of the **near-field during repository operations**. The work will allow advanced national radioactive waste disposal programmes to design monitoring systems suitable for deployment when repositories start operating in the next decade. The work will support less developed programmes and other stakeholders by illustrating how the national context can be taken into account in designing dedicated monitoring programmes tailored to their national needs.

Started in June 2015 – Duration: 4 years

www.modern2020.eu

Project structure



Consortium: 29 partners from 12 countries



WP2: Monitoring strategies

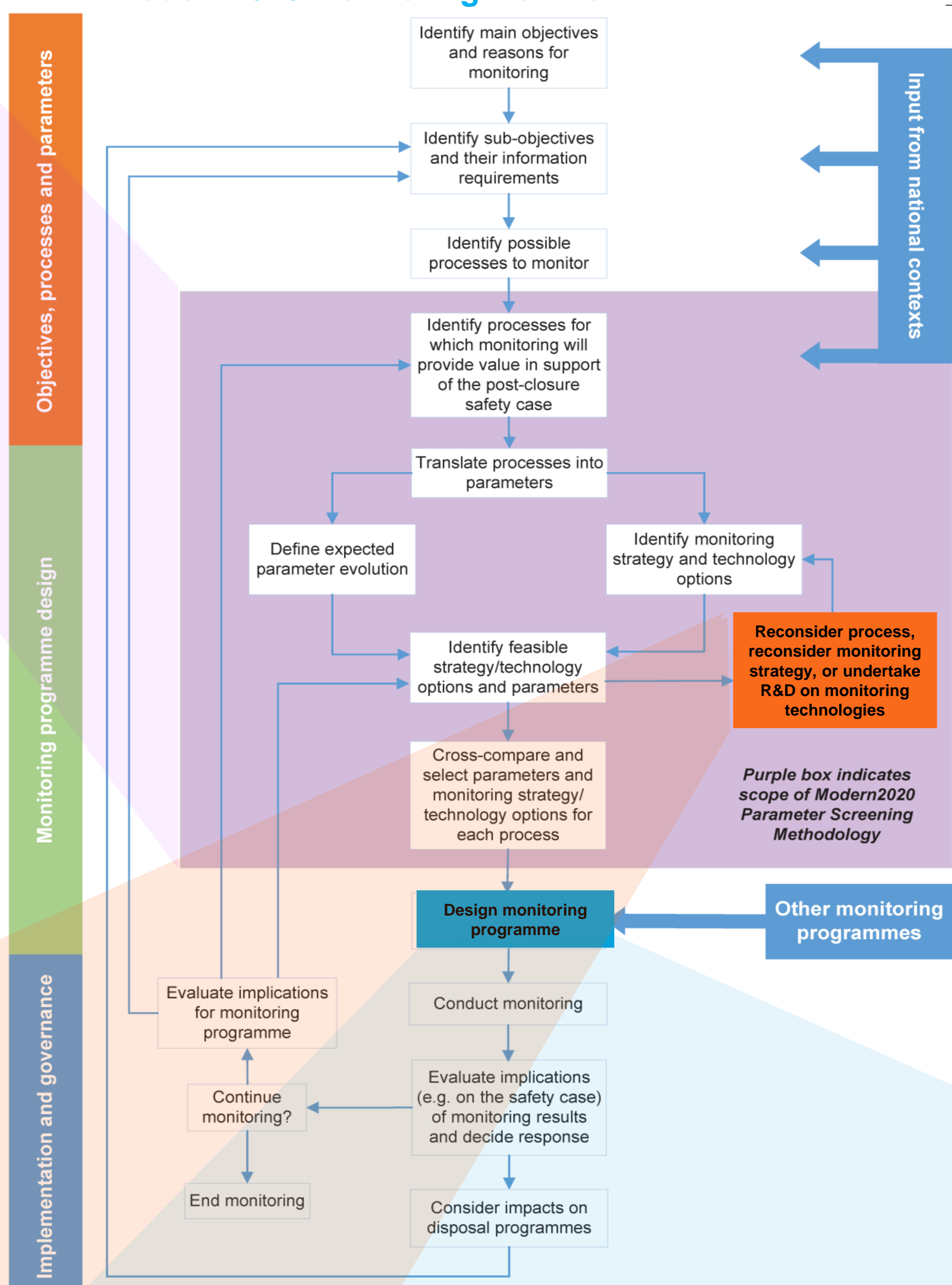
- Understand the needs of specific types of repository programme and to provide the methodology for translating these needs into a monitoring programme design basis.
- Develop collective opinions on decision-making, performance measures for monitoring system responses and responding to monitoring results

• First results is the **Modern2020 Screening Methodology**
The Modern2020 Screening Methodology (deliverable 2,1 on website) provides an overview of the steps that a WMO may take in identifying and managing a list of parameters, linked to processes, and repository monitoring strategies and technologies. The list of parameters will form a basis for repository monitoring system design at each stage of an iterative repository monitoring programme that evolves through the implementation of geological disposal

WP3: R&D on monitoring technologies

- Improve wireless monitoring technology including the combination of high-frequency and low-frequency systems.
- Research alternatives power supplies.
- long-term performance of sensor technologies
- Develop new sensors based on optical fibre, low-intrusive techniques including sensors to monitor water content and water chemistry, pH and irradiation.
- Refine and further improve the most promising geophysical methods for non-intrusive monitoring.
- Establish a common methodology for qualifying the components of the monitoring system.

Modern2020 Monitoring workflow

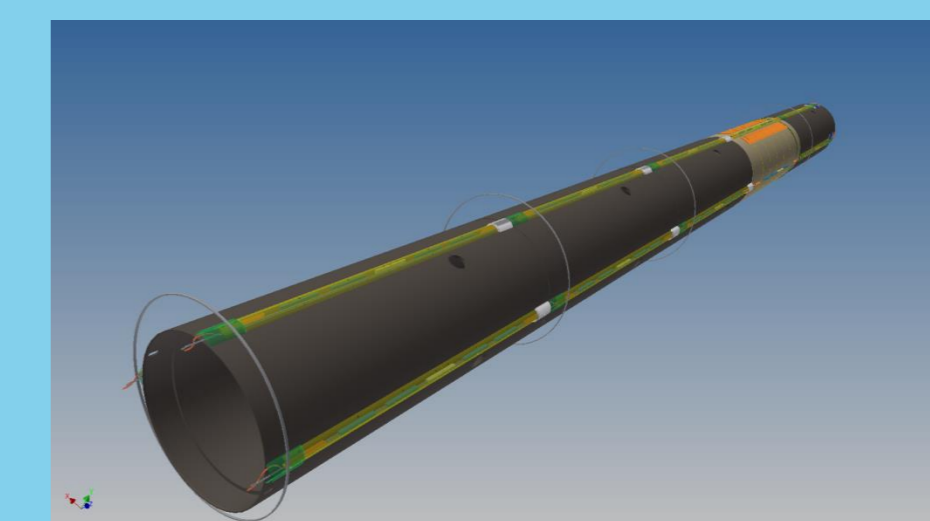


WP5: Societal concerns and Stakeholder Involvement:

- Engage local public stakeholders in national and international repository monitoring R&D, and to analyse the impact this has on both stakeholders' involvement and consortium partners,
- Define more specific ways for integrating public stakeholder concerns and expectations into national repository monitoring programmes.
- Develop ideas on how to communicate monitoring data (of the type gathered through *in-situ* monitoring) to public stakeholders.

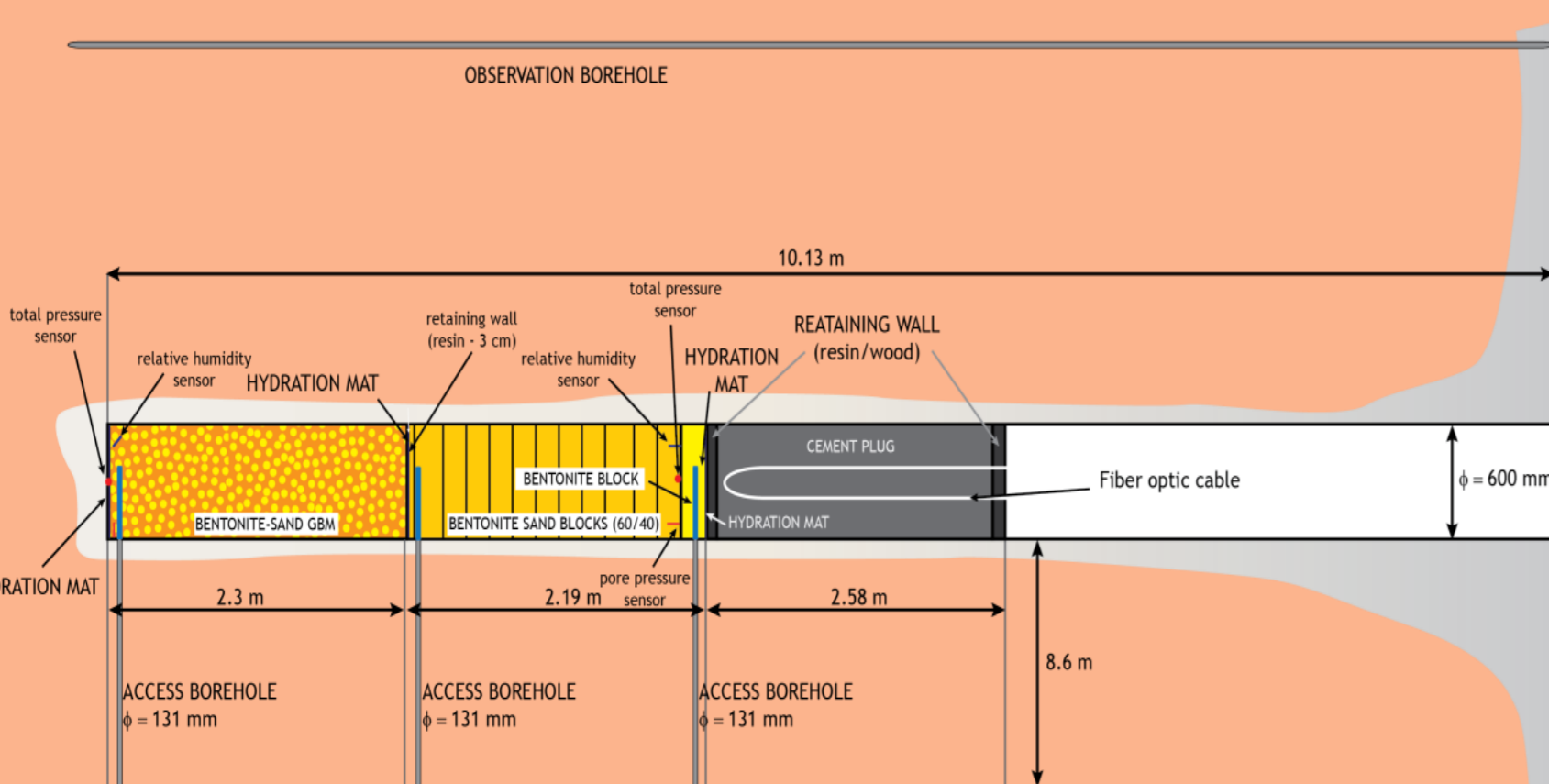
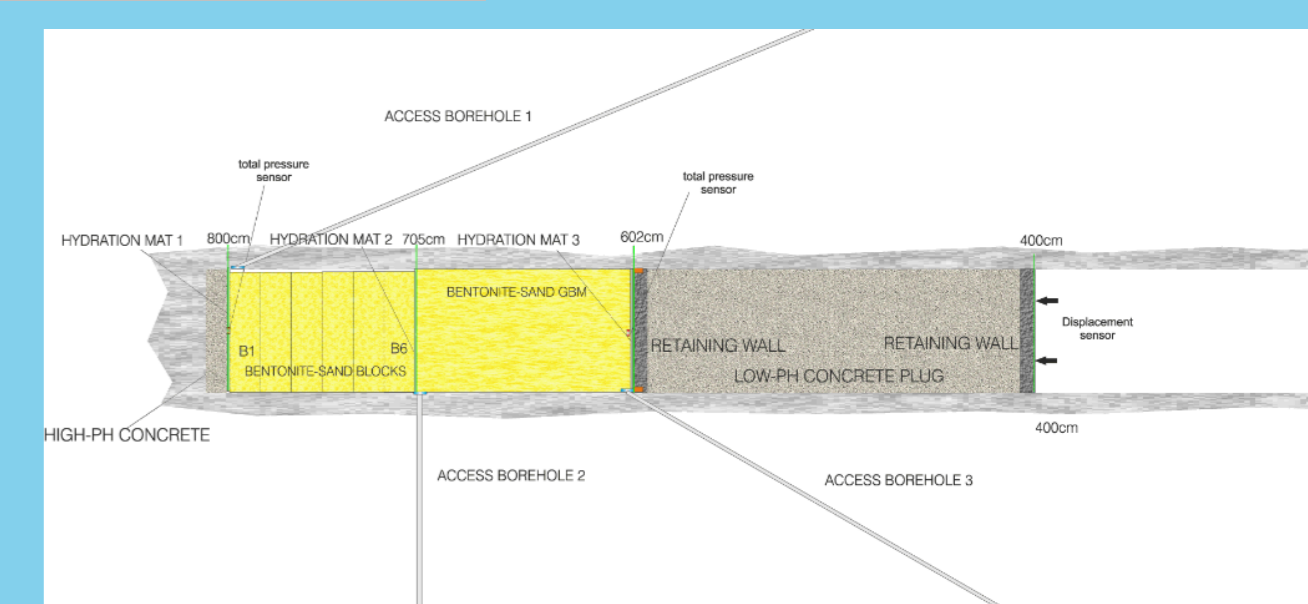
WP4: Demonstration of monitoring design

- Demonstrate new technology developments under *in-situ* conditions.
- Demonstrate the development of a monitoring system design utilising multiple technologies and linked to a specific safety case.
- Utilise existing experience in near-field monitoring to provide guidance on monitoring system design, e.g. by examining whether existing monitoring technologies can provide information on the required parameters, at the required frequency and accuracy.



HA industrial pilot experiment, Bure (France), representation of the optical fiber system on the metallic liner

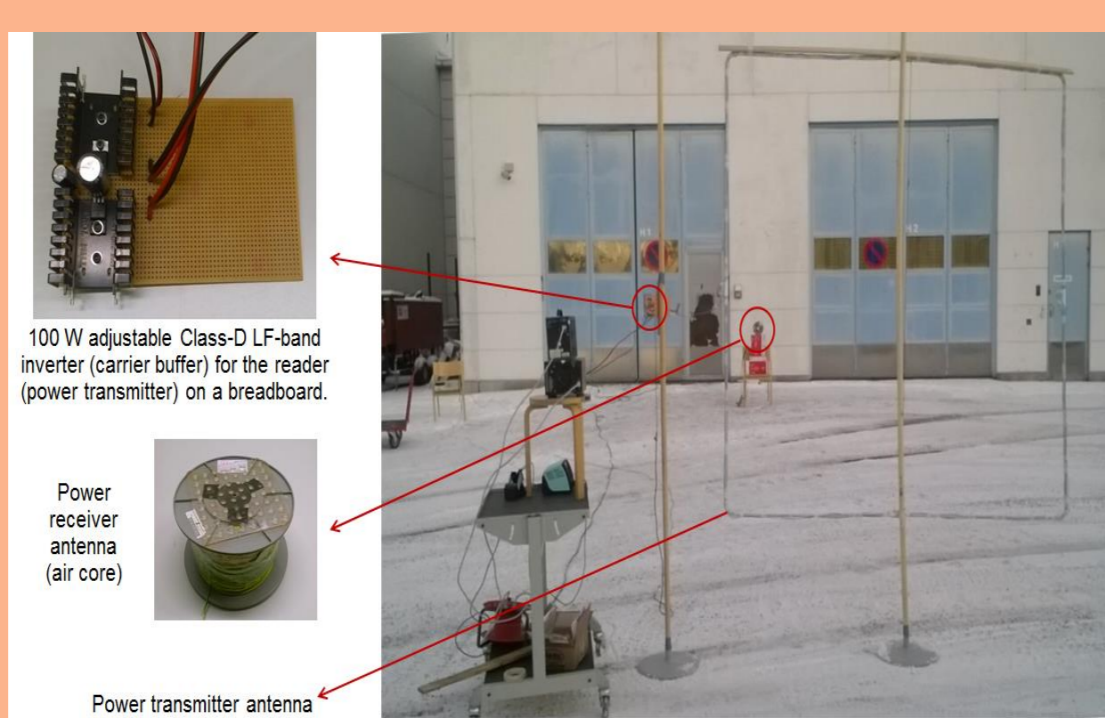
Long-Term Rock Buffer Monitoring (LTRBM), Tournemire (France)



Layout of Wireless Testing Bench (WTB) experiment



Combined THMC smart sensors



Wireless energy transmission
Test set-up for measuring the DC-to-DC power transfer performance up to 10 m operation distance