

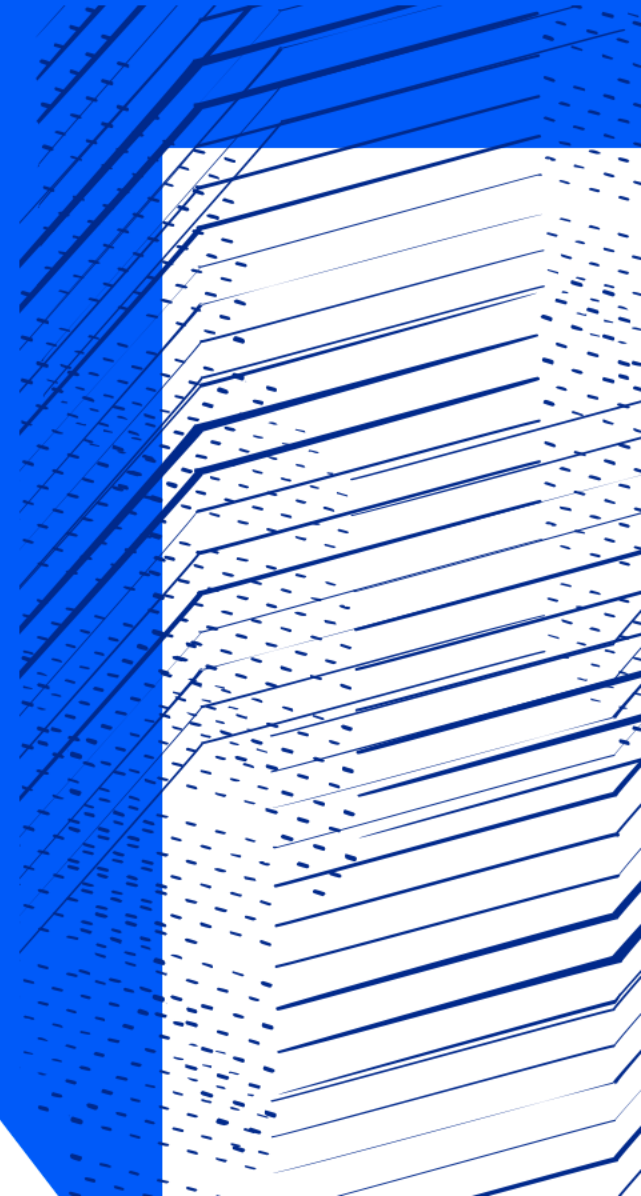


Science and
Technology
Facilities Council

Boulby Underground
Laboratory

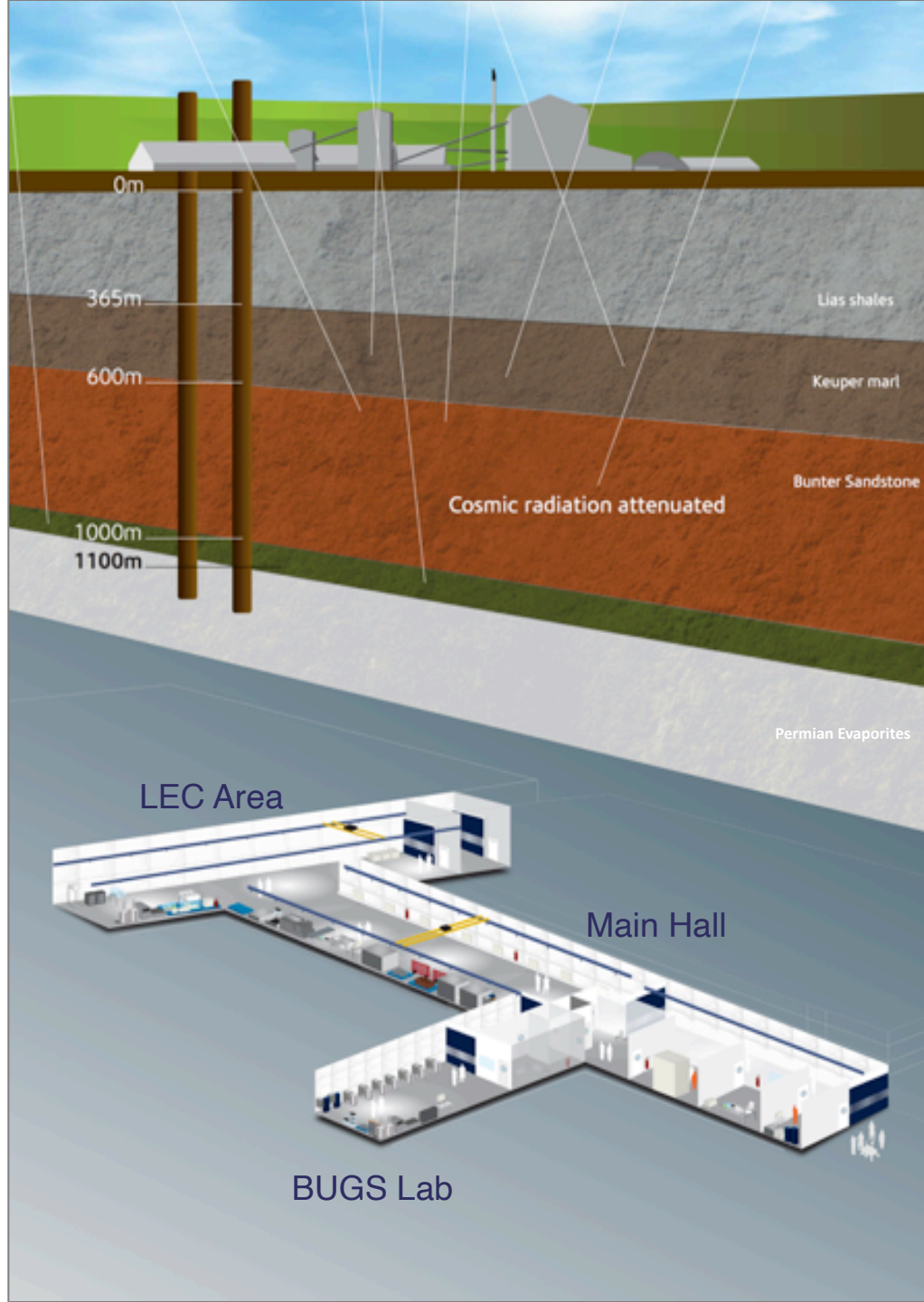
QTFP at the Boulby Underground Laboratory

Paul Scovell – 24/09/2024



Current Facility

- Ready now for projects
 - Small/medium scale
 - Desktop to a few m²
- Several QTFP projects have applied for medium scale fund
- Workshop held at Durham last week to discuss Quantum@Boulby
 - <https://conference.ippp.dur.ac.uk/event/1372/>
- Lots of additional information to be found here



Class 10,000

475 m² @ 3.75 m height

240 m² @ 5.75 m height

Class 1000

100m² @ 3.75 m height

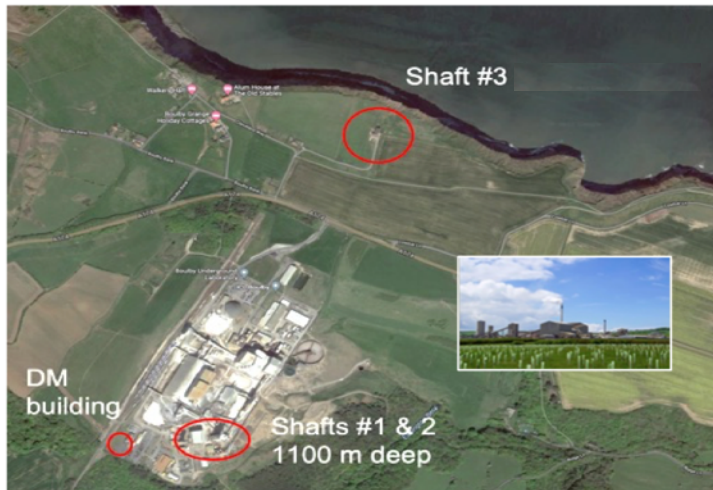
10 tonne and 5 tonne cranes
Climate control $\pm 1\text{C}$

Material radioassay facilities

Shaft 3

Tailings (no. 3) shaft specs:

- 144 m vertical shaft
- ~50m from coastal cliffs.
- 5m diameter shaft with 3T capacity crane.
- Personnel Cage (used few times/day), water & ventilation pipes, access stairs/ladders



Currently instrumenting with seismometers to measure the micro-seismicity for future shaft-based experiments

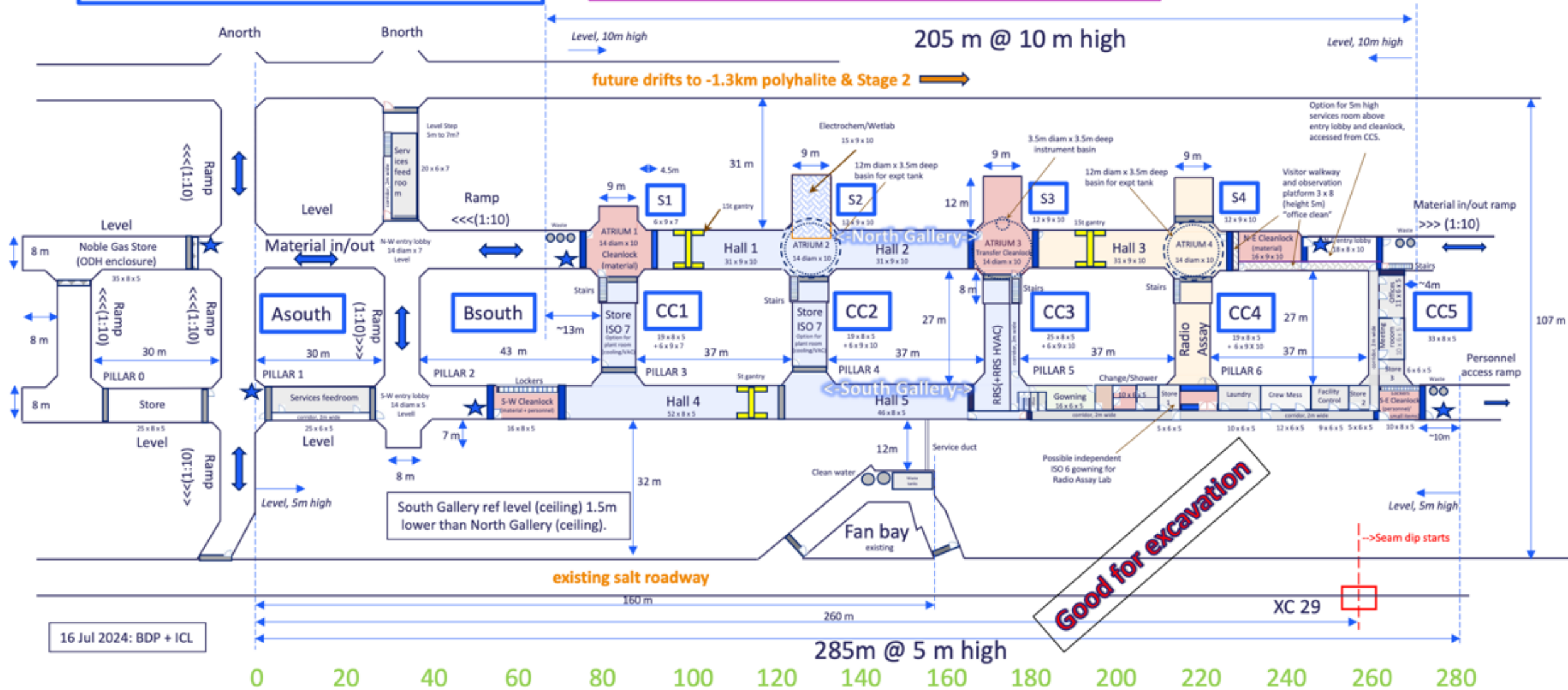
Future Plans

- Funding secured to excavate a new facility
 - Substantially larger than the existing lab
 - Worked with XLZD UK to determine specification for construction
 - Designed excavation for larger science programme parallel to and beyond XLZD construction
- ISO6/7 lab space potential for quantum projects
- Halls of 8 m wide 5 m high & 9 m wide 10 m high excavated
- Several areas with 14 m diameter and 13.5 m height excavated
 - For larger experiments

Stage 1 Functional Layout, revision 8.2.1

Stage 1: ~45000 m³, 6000m² footprint
 Current lab: ~6000m³, 1200m²

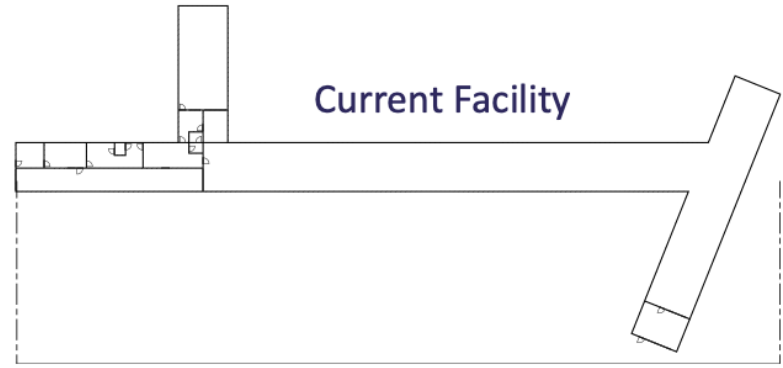
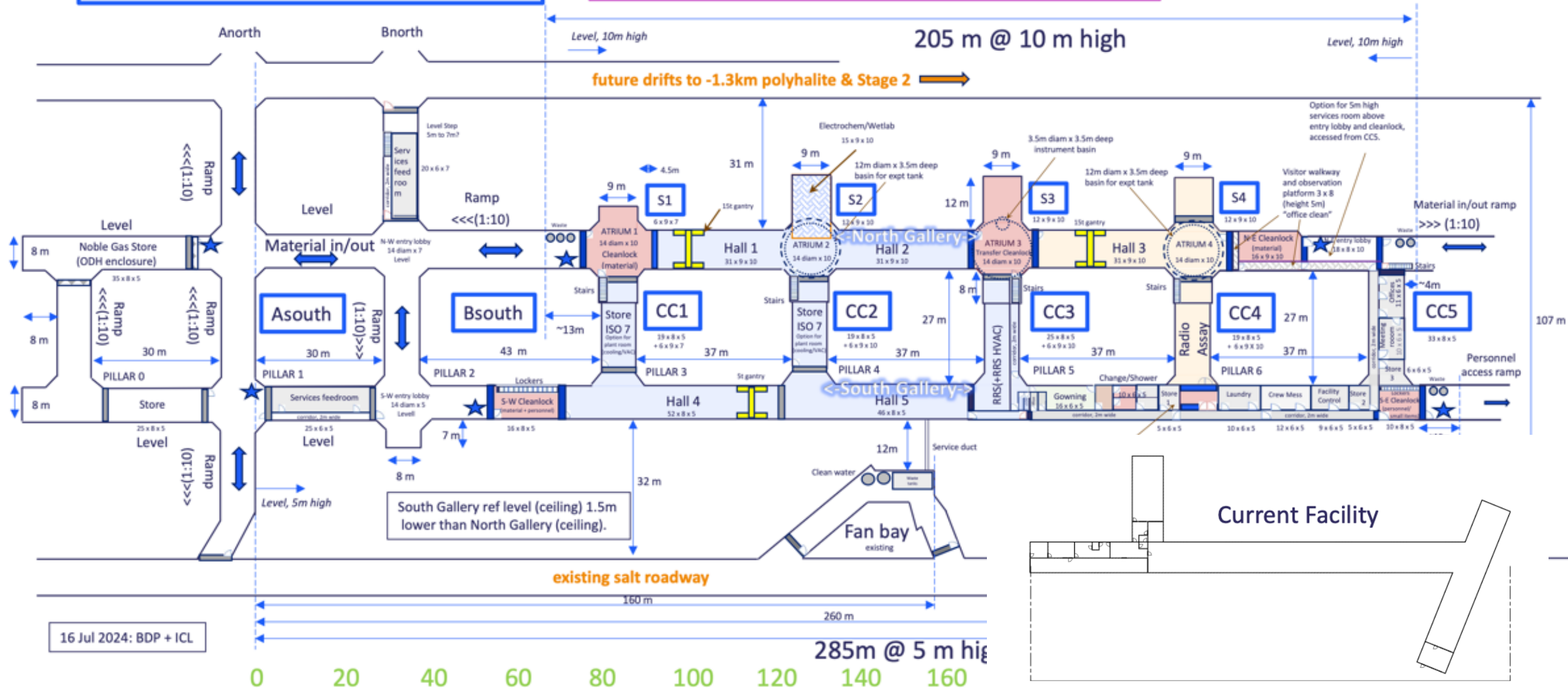
(excluding external zones)



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(excluding external zones)



16 Jul 2024: BDP + ICL

Future Quantum Work

- Several measurements to support future quantum studies are underway:
- Electric field measurements
 - Some initial studies performed with BGS & RAL, more to come
- Seismic measurements
 - Studies to be performed in underground area, shaft 3 and on the surface
 - Will give a full picture of the seismic profile at Boulby
 - Using a number of sensors from Guralp