

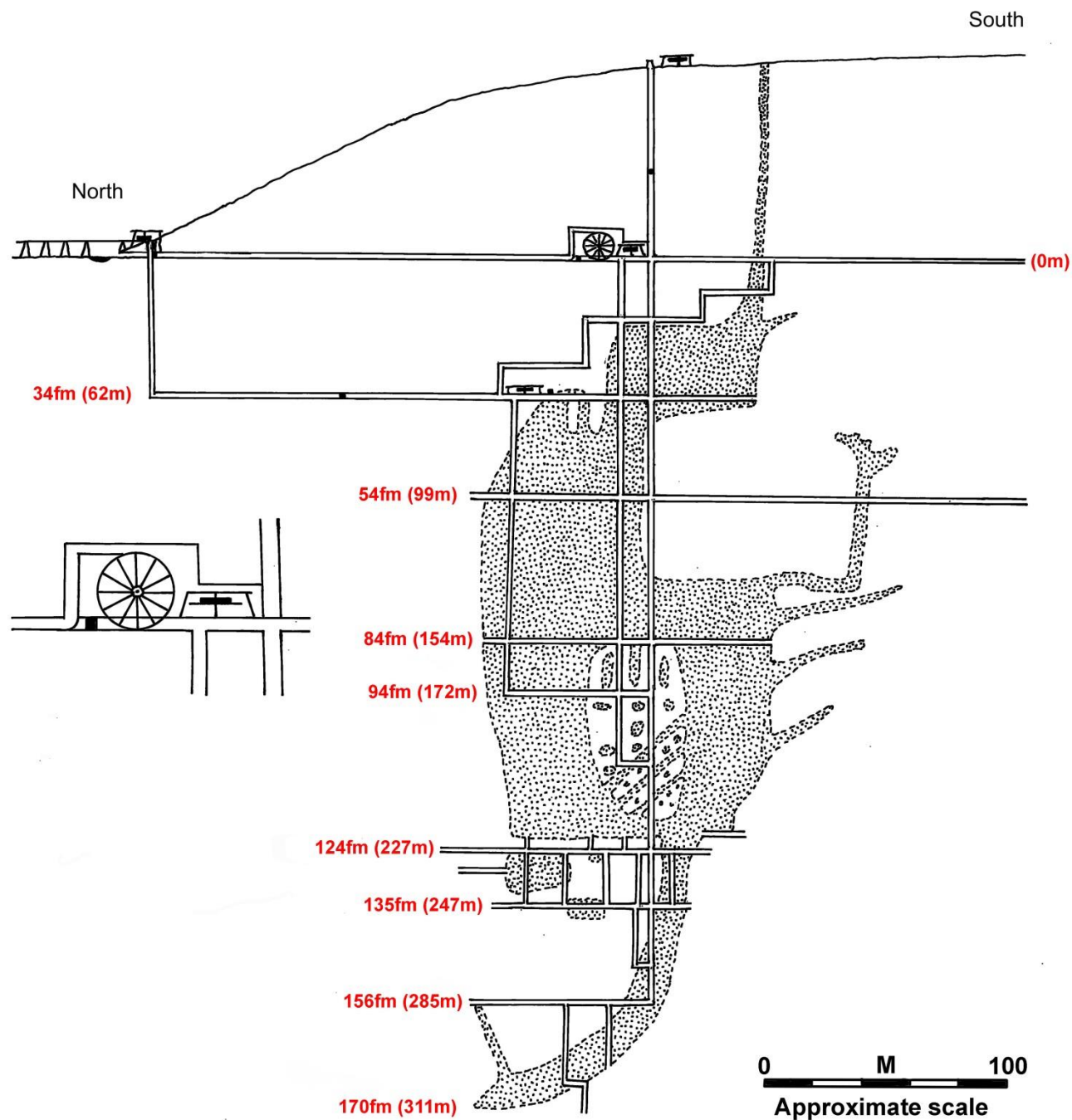
Archaeological Discoveries at Deep Ecton Mine May 2019

John Barnatt

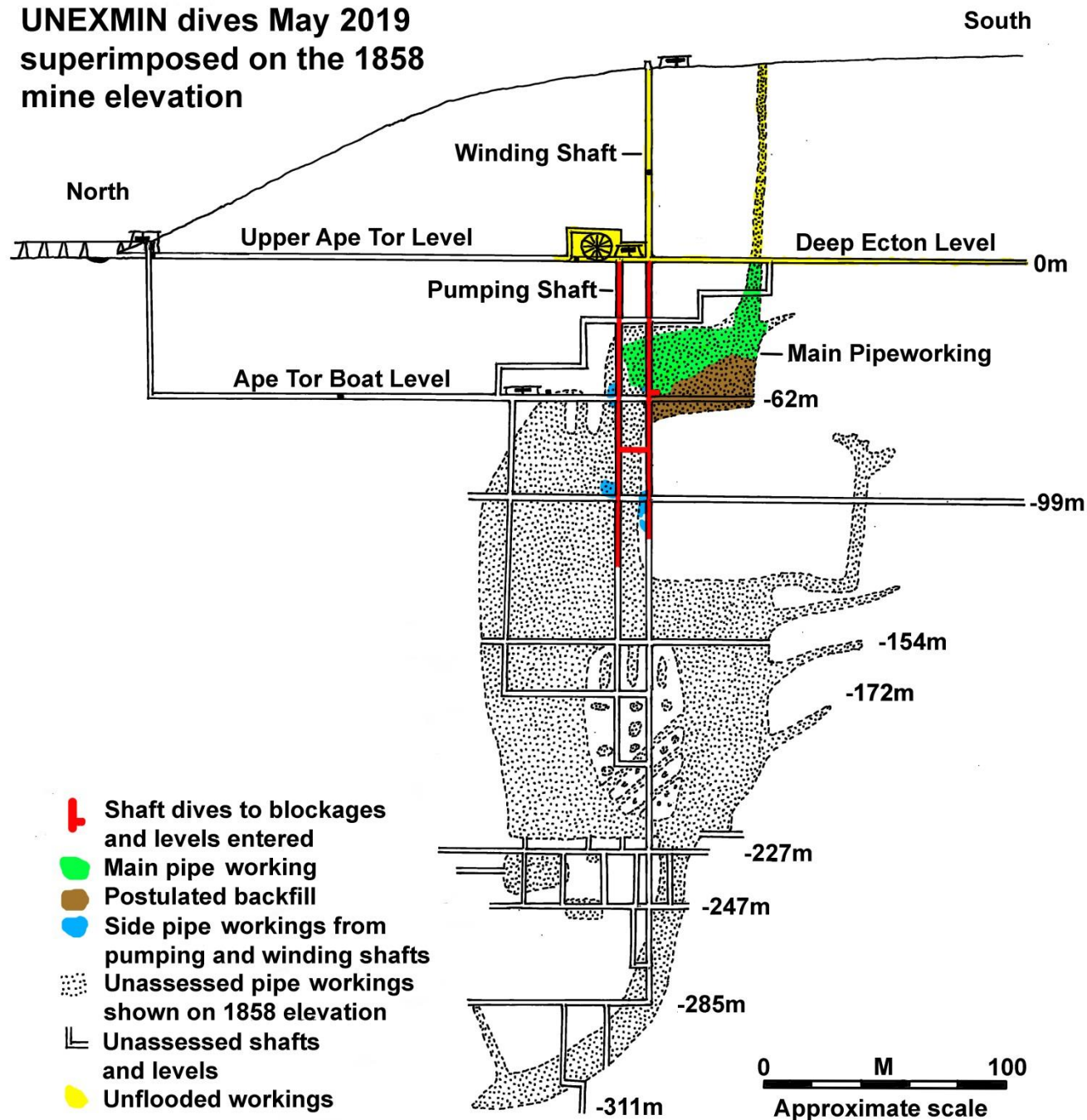


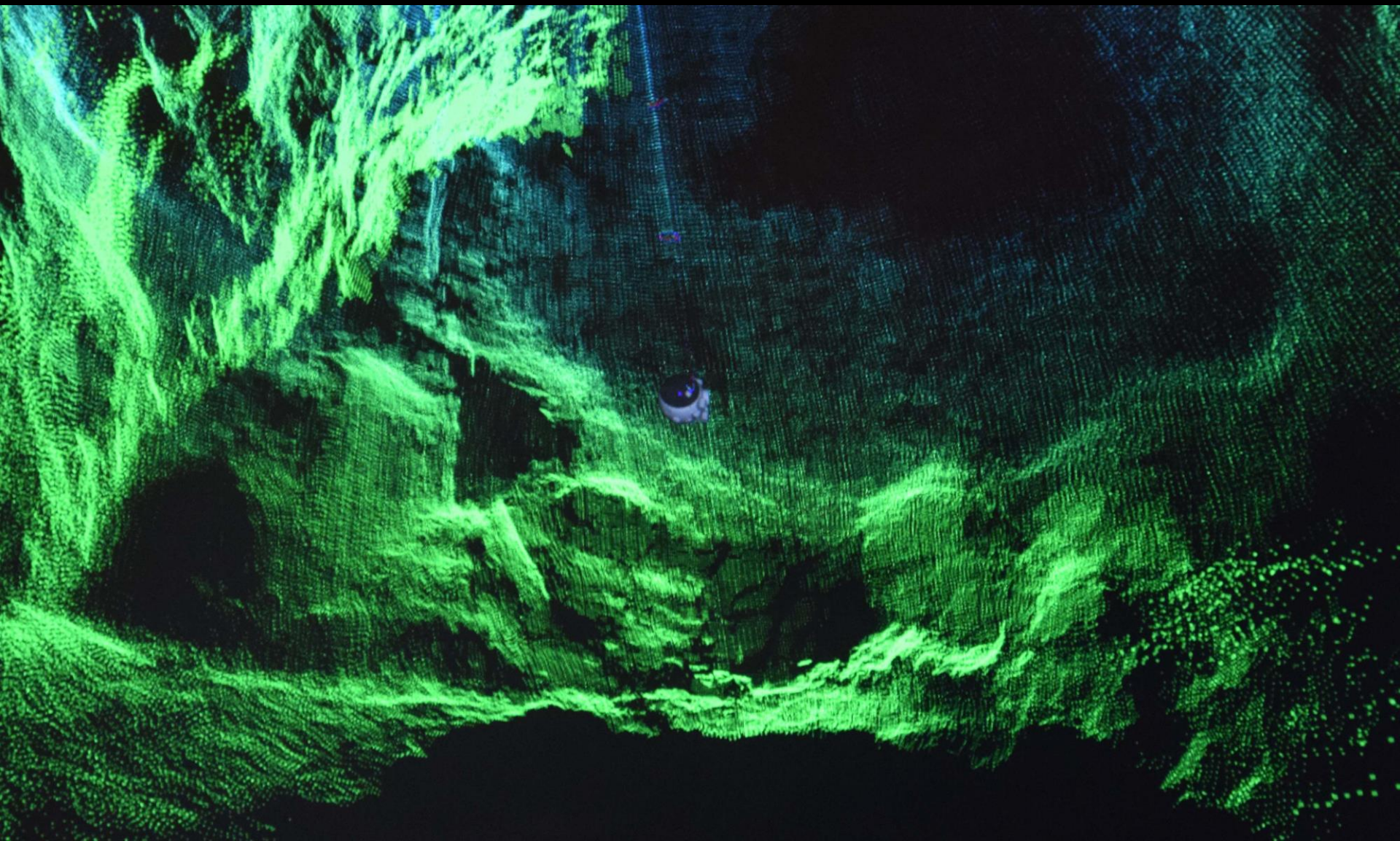
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 690008.

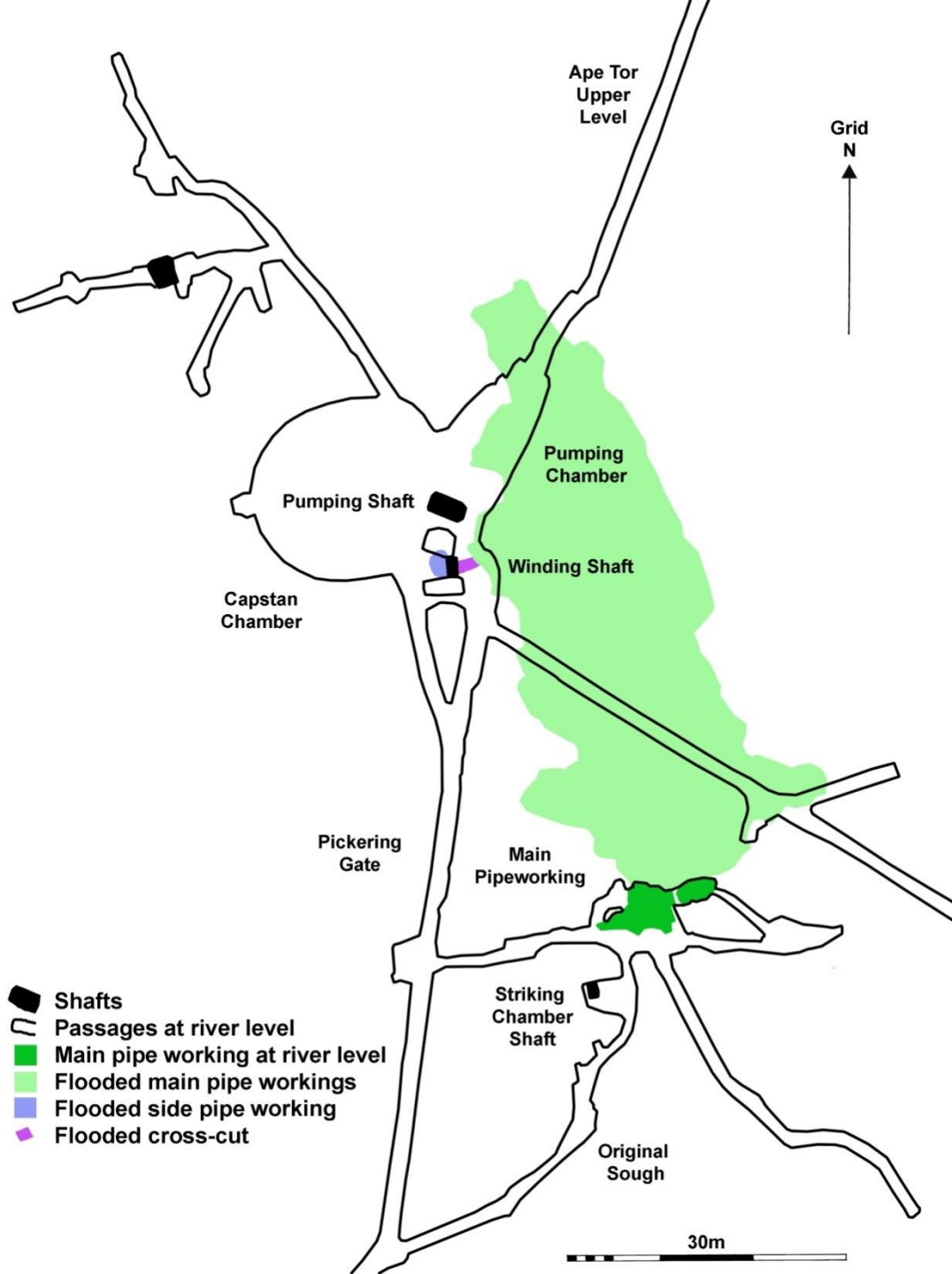


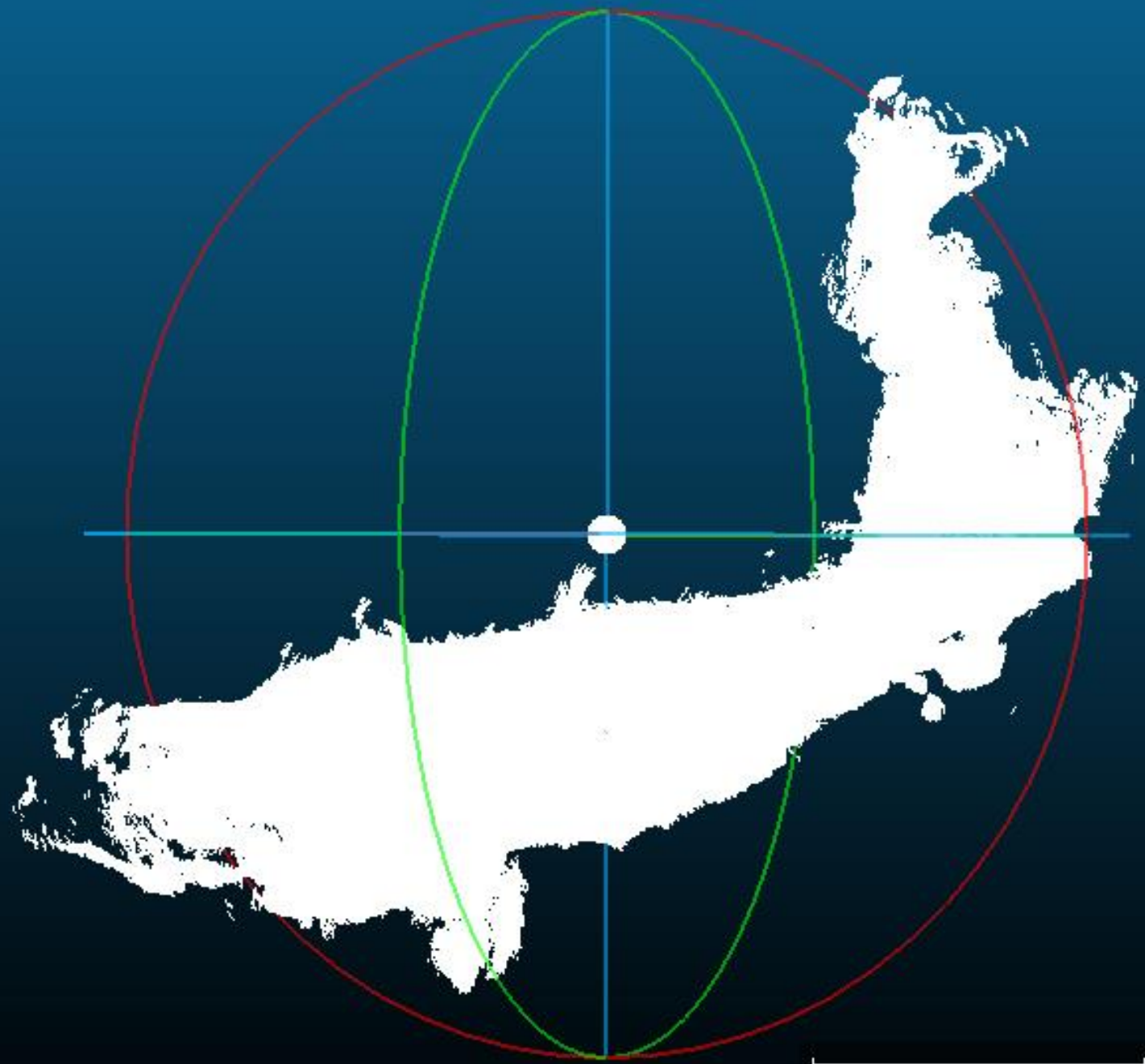


**UNEXMIN dives May 2019
superimposed on the 1858
mine elevation**



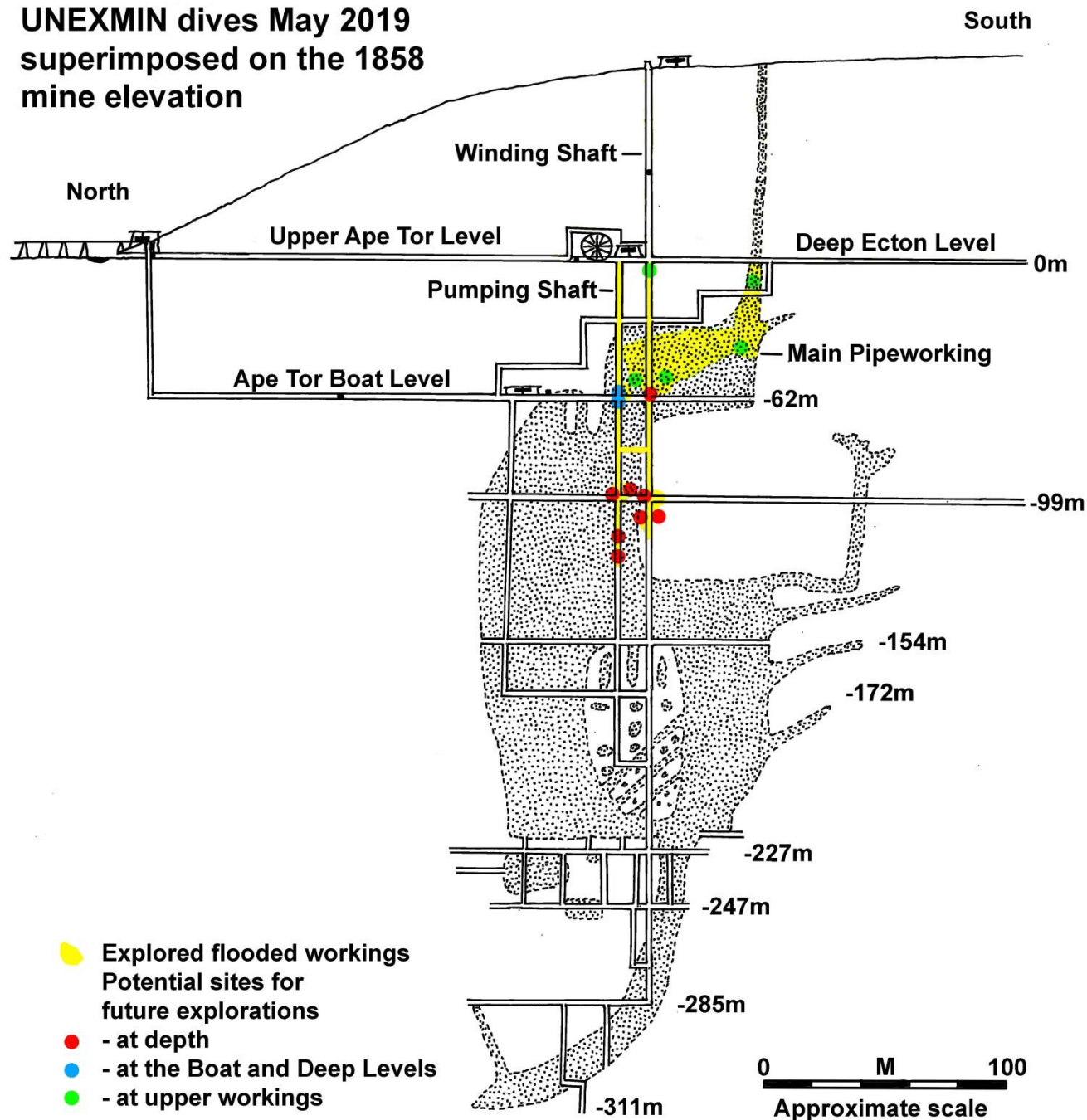






25

**UNEXMIN dives May 2019
superimposed on the 1858
mine elevation**



front_led_corrected: 1558980028595548965 = 2019-05-27 18:00:28



Depth: 58.0
X, Y: 45.3, -9.5
Roll: -1.3, Pitch: 1.1, Yaw: 42.1

front_led_corrected: 1559129670782265451 = 2019-05-29 11:34:30



Depth: 26.4
X, Y: -1.3, 1.7
Roll: -2.3, Pitch: -0.2, Yaw: 324.2

right_led_corrected: 1558112236345351562 = 2019-05-17 16:57:16



Depth: 8.5
X, Y: 3.2, 0.4
Roll: 0.9, Pitch: -1.2, Yaw: 67.0

right_led_corrected: 1558103871474722226 = 2019-05-17 14:37:51



Depth: 2.2
X, Y: -0.3, -0.0
Roll: 0.0, Pitch: 1.0, Yaw: 229.8

front_led_corrected: 1558885487363993291 = 2019-05-26 15:44:47



Depth: 61.9
X, Y: 0.4, 2.1
Roll: -1.1, Pitch: -4.4, Yaw: 273.4

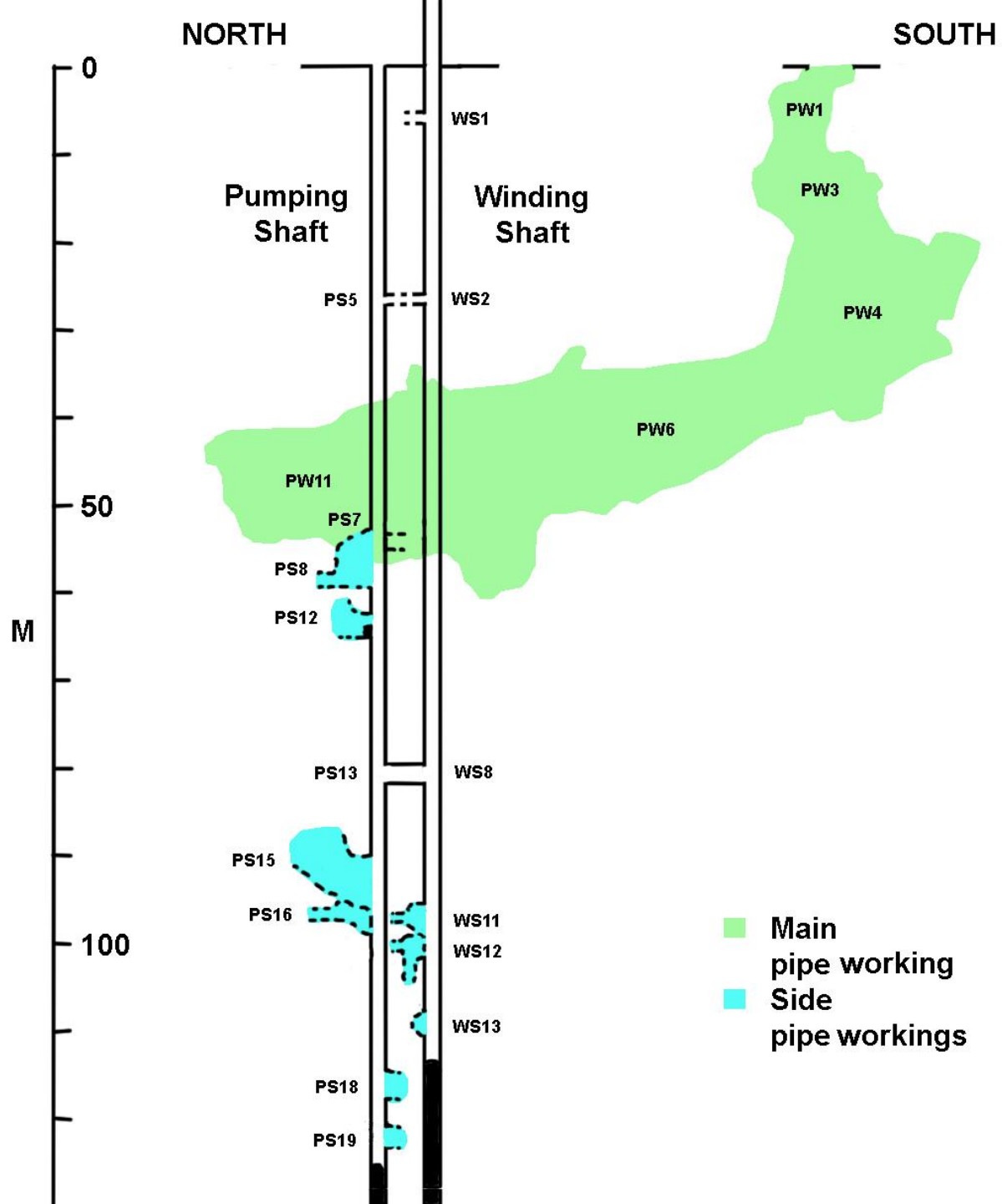
rightLied_corrected: 1558110260047074967 = 2019-09-17 16:24:20



Depth: 61.6
X, Y: 0.8, -2.2
Roll: 1.8, Pitch: -1.1, Yaw: 50.2

front_uv_corrected: 1558372884923358507 = 2019-05-20 17:21:24

Depth: 64.3
X, Y: -6.6, 0.3
Roll: 2.6, Pitch: -0.2, Yaw: 68.0



front_led_corrected: 1559062422294194752 = 2019-05-28 16:53:42



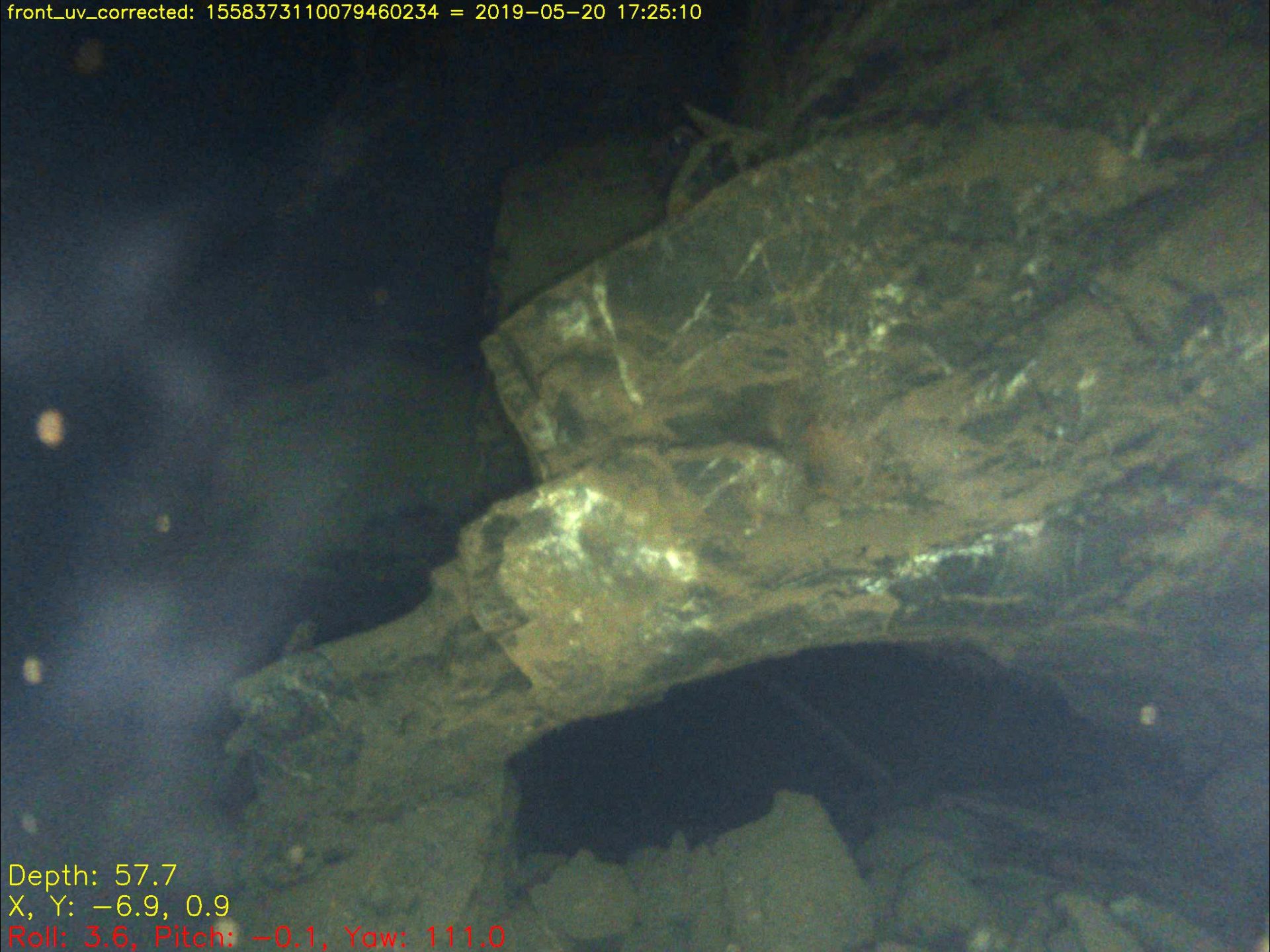
Depth: 58.1

X, Y: 34.3, -9.8

Roll: -1.6, Pitch: 3.1, Yaw: 242.1

front_uv_corrected: 1558373110079460234 = 2019-05-20 17:25:10

Depth: 57.7
X, Y: -6.9, 0.9
Roll: 3.6, Pitch: -0.1, Yaw: 111.0



Geological observations arising from the UNEXMIN exploration dives in Deep Ecton Mine

RP Shaw



Ecton Mines Education Trust

My Background

- Retired (2016) Principal Scientist,
British Geological Survey.
- Mining Geologist.
- Karstic sediments (PhD).
7 years Uranium
exploration.



25 years Geological disposal of radioactive waste.

Board member CoRWM (from Dec 2016).

.....and lots more!

The Deep Ecton Mine is situated within Ecton Hill which comprises a sequence of mainly limestone strata of Dinantian (Lower Carboniferous) age.

- Mixon Limestones with Shales (Brigantian)
- Ecton Limestones (Asbian)
- Milldale Limestones (Chadian and Arundian)
- Rue Hill Dolomites and Red House Sandstones (Courceyan)

MV type deposit of Cu, Pb and Zn with 3 types of mineral deposit at Ecton:

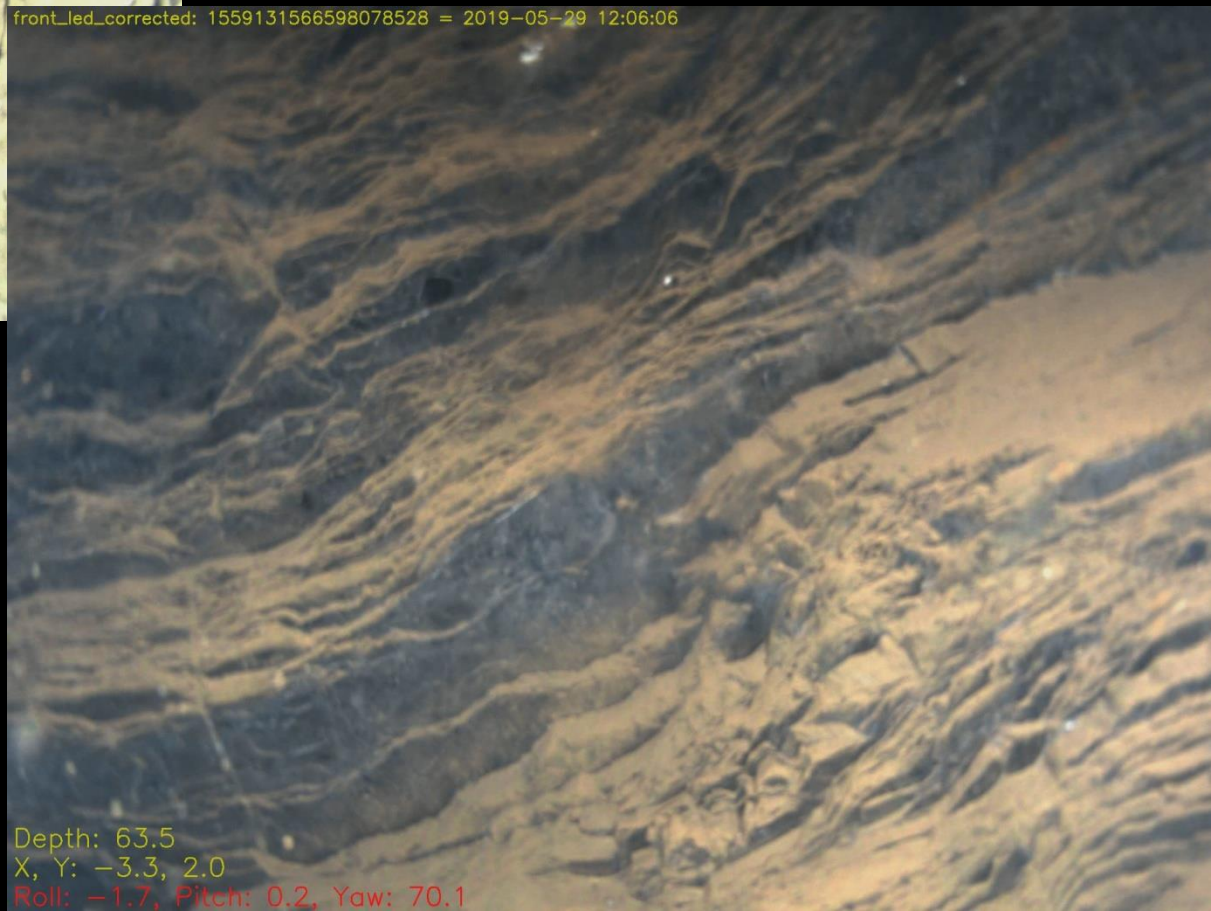
- Lodes – steeply dipping to near vertical fissure veins perhaps occupying faults;
- Saddles – Ores deposited in the limbs and joints of the smaller scale fold structures;
- Pipes – The main ore deposits at Ecton are more or less cylindrical features steeply inclined and cutting through the strata.

006342026896 = 2019-05-17 15:46:46



1.2, Yaw: 207.7

front_led_corrected: 1559131566598078528 = 2019-05-29 12:06:06



Depth: 63.5
X, Y: -3.3, 2.0
Roll: -1.7, Pitch: 0.2, Yaw: 70.1

light_led_corrected: 1559136935108426926 = 2019-05-29 13:35:35

Depth: 78.9
X, Y: -1.7, 3.6
Roll: 0.5, Pitch: 0.8, Yaw: 185.3

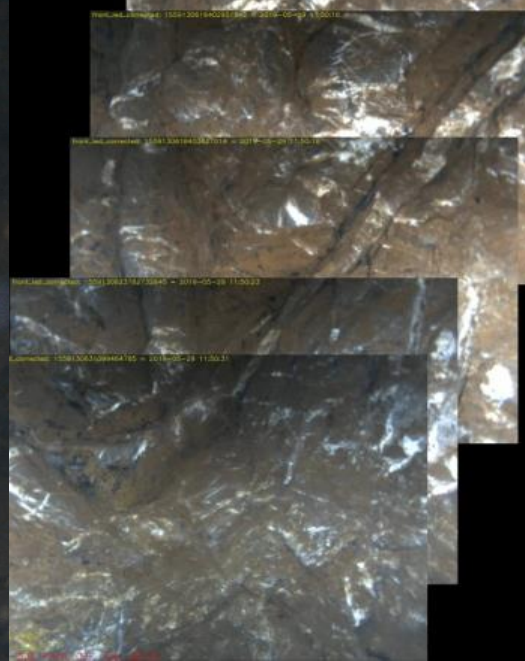
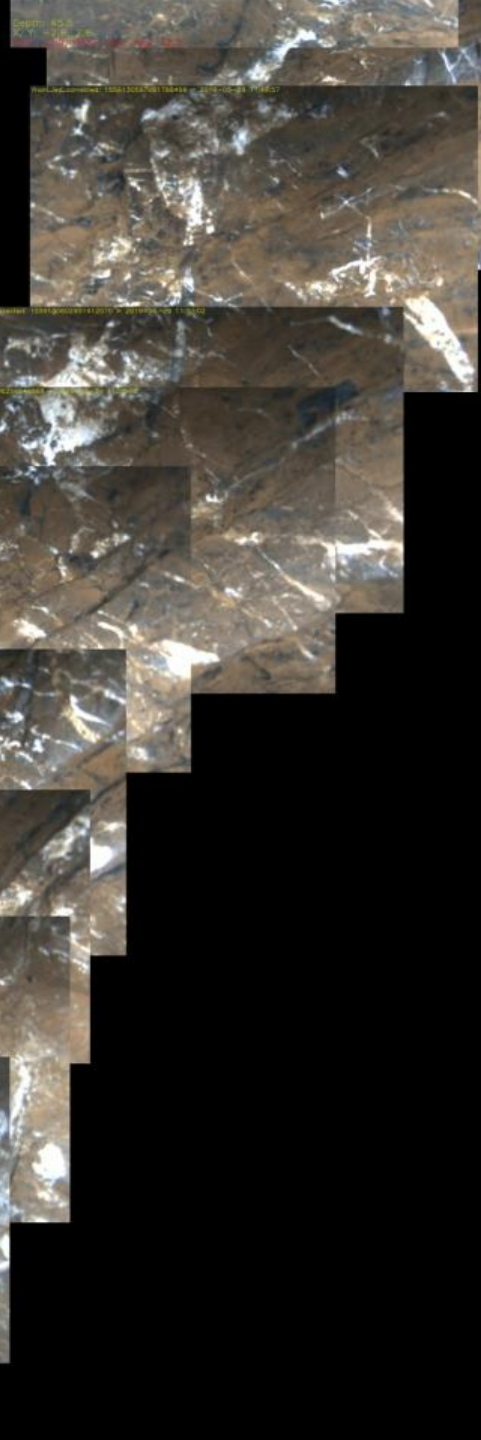
front_led_corrected: 1559138495108714149 = 2019-05-29 14:01:35



front_led_corrected: 1558890354505 09216 = 2019-05-26 17:05:54



Depth: 92.0
X, Y: -0.2, 4.2
Roll: -4.7, Pitch: -10.3, Yaw: 248.2



right_led_corrected: 1559062523599549679 = 2019-05-28 16:55:23



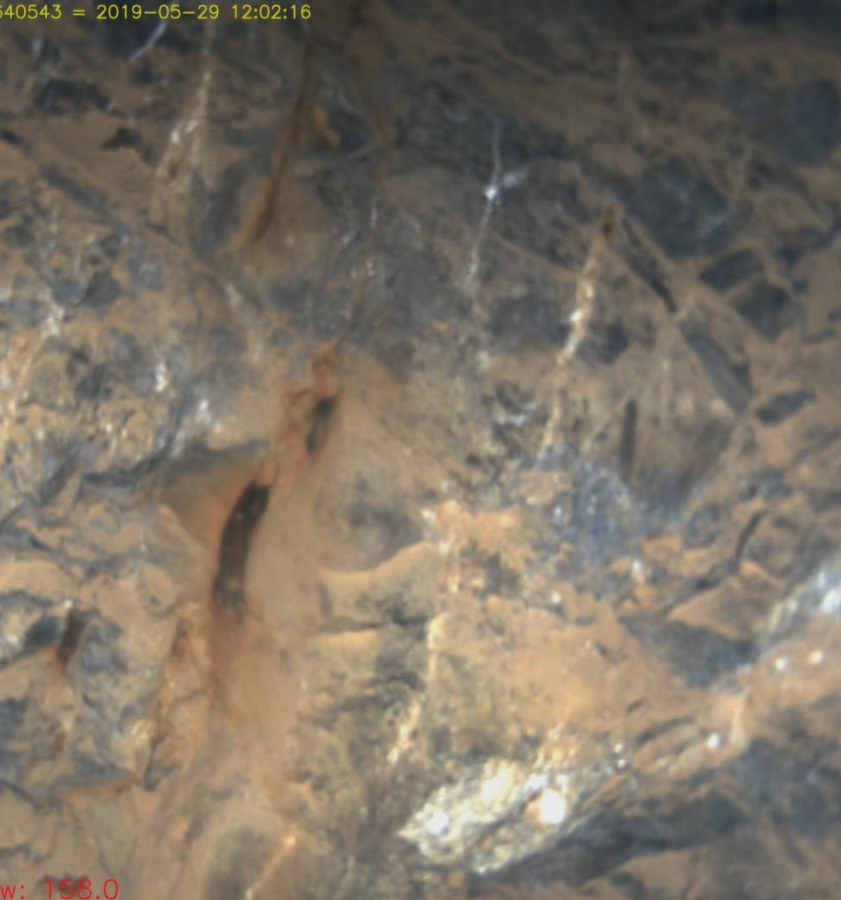
Depth: 58.1
X: 33.8, Y: -10.8
Roll: -0.7, Pitch: 0.1, Yaw: 275.9

front_led_corrected: 1559130304782365218 = 2019-05-29 11:45:04



Depth: 37.4
X, Y: -1.9, 2.3
Roll: -2.0, Pitch: 0.5, Yaw: 101.9

40543 = 2019-05-29 12:02:16



w: 158.0

erected: 1558889256864932782 = 2019-05-26 16:47:36



123.9

3, 6.6

1.2, Pitch: 2.4, Yaw: 19.9



Corrected: 1558886424694962969 = 2019-05-26 16:00:24

01.6
0.7, 5.6
Pitch: -3.1, Yaw: 176.9

front_led_corrected: 155904182382002274 = 2019-05-28 11:10:23

front_led_corrected: 15590418809474 = 2019-05-28 11:10:30

front_led_corrected: 1559041853638890064 = 2019-05-28 11:10:53

front_led_corrected: 1559041874992992270 = 2019-05-28 11:11:14

front_led_corrected: 1559041891294341775 = 2019-05-28 11:11:31

front_led_corrected: 1559041907000891912 = 2019-05-28 11:11:47
front_led_corrected: 1559041914990975899 = 2019-05-28 11:12:03
front_led_corrected: 1559041980138011579 = 2019-05-28 11:13:00

front_led_corrected: 1559041920635122982 = 2019-05-28 11:13:16

Depth: 4.8
X, Y: 4.6, -12.6
Pitch: -0.9, Yaw: 261.7

Depth: 4.8
X, Y: 4.6, -12.6
Pitch: -0.9, Yaw: 261.7

Depth: 56.7
X, Y: 4.6, -13.5
Pitch: -0.9, Yaw: 261.7

Depth: 56.7
X, Y: 4.6, -13.5
Pitch: -0.9, Yaw: 261.7

Depth: 57.5
X, Y: 4.6, -13.6
Pitch: -0.9, Yaw: 261.7

right_led_corrected: 1559064923602531431 = 2019-05-28 17:35:23

Depth: 13.8
X: 19.5 Y: 28.4

- **Conclusions**

- The ten UNEXMIN dives at Deep Ecton have provided a wealth of new information on the geology of the mine;
- They have confirmed that the structural geology of the mine is complex;
- There is extensive development of early hydraulic fractures filled with white calcite in proximity to the pipe with at least 2 and sometimes more than 3 phases;
- The larger parts of the pipe appear to be mainly or entirely within more thickly bedded limestones. (Favorable host rock for the pipe mineralisation which may have been partially controlled by the structural geology);
- The exploration to date confirms that the mine was thoroughly stripped of all ore prior to closure;
- The dives have only explored a small fraction of the flooded workings at Deep Ecton but have provided a wealth of information as well as some tantalising glimpses of what remains to be explored;
- Large amounts of data are available that will allow a detailed structural study to be undertaken in due course.