Radon and equivalent gamma dose rate variations at different types of antropogenic inhomogeneities

Ivan Barnet, Petra Pacherová, Michal Poňavič

Czech Geological Survey

www.geology.cz

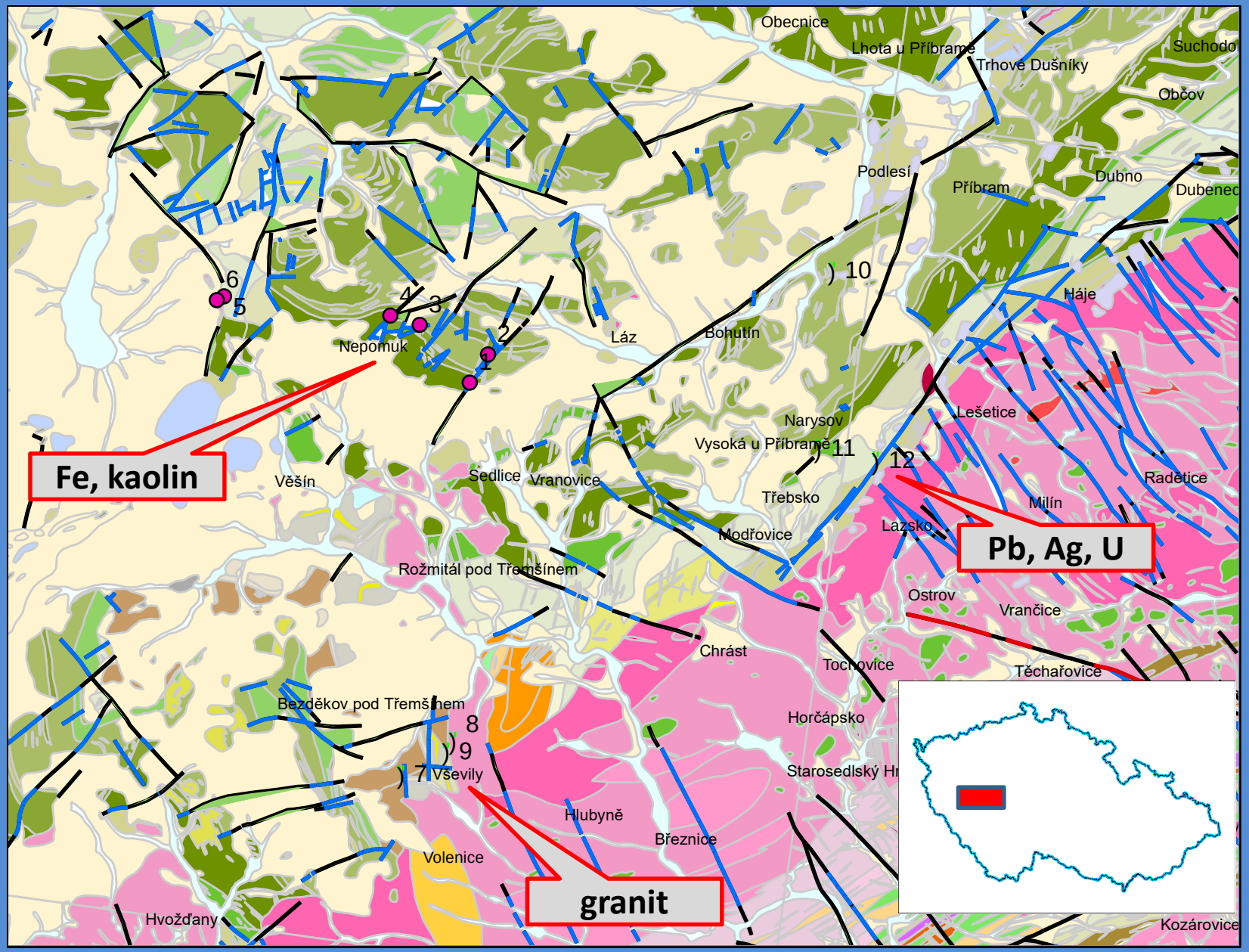
Sources of data:

Geology – Czech Geological Survey

Lidar+topo – State Administration of Land Surveying and Cadastre (licensed)

3D views – www.mapy.cz public server

Photos – Mining Museum Příbram www.muzeum-pribram.cz and server www.brdy.org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Sedlice
Vranovice
Věšín
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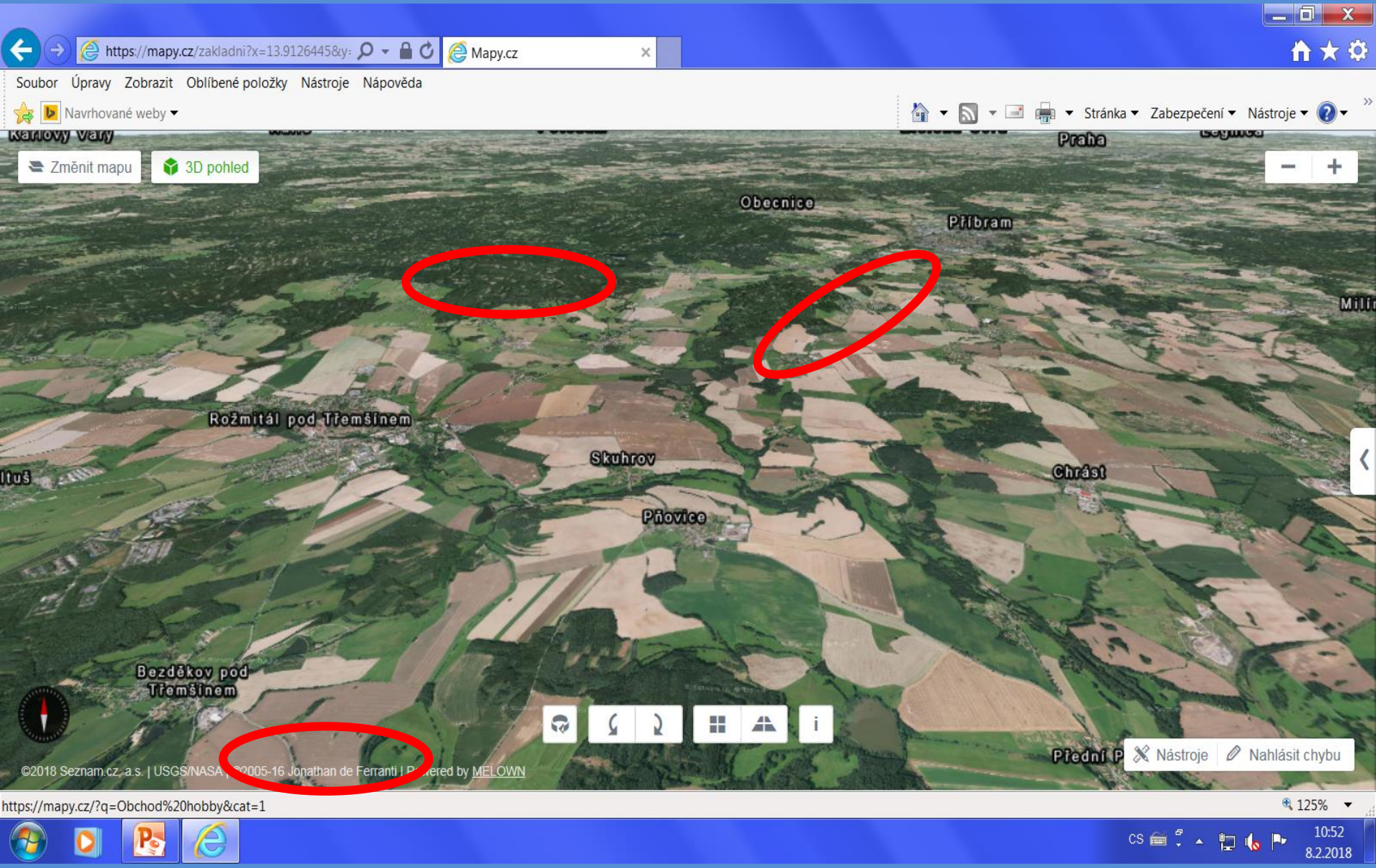
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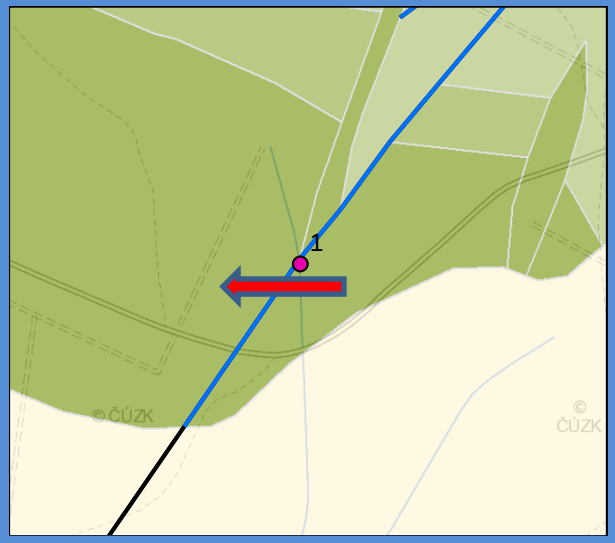
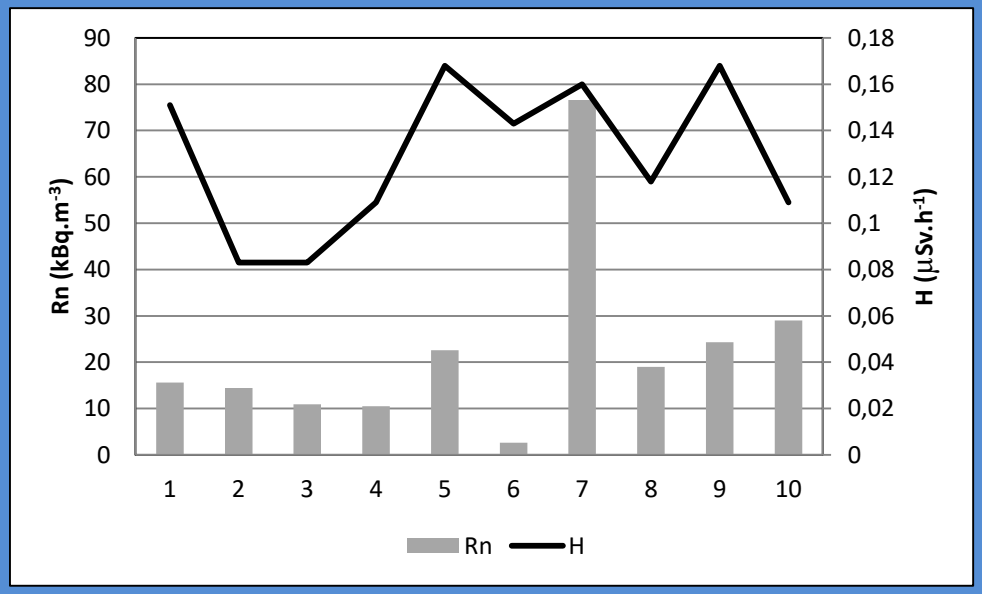
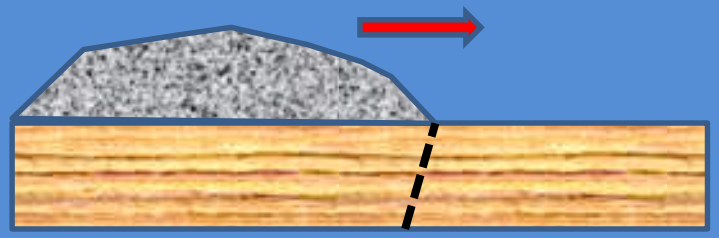




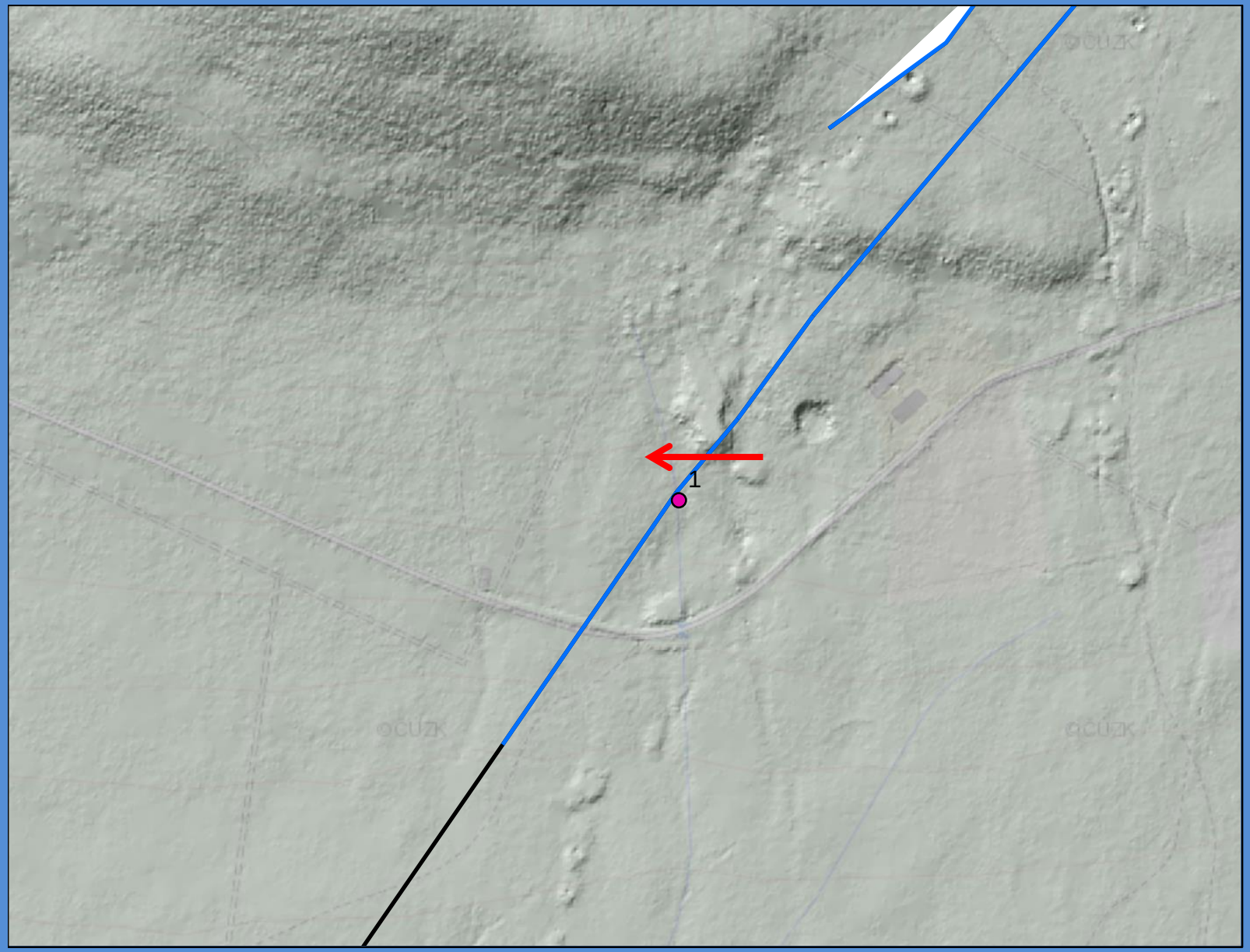


Locality Pourka

Profile across the medieval waste dump (18th century), Fe mining in Cambrian graywackes, dolerite vein, fault

Decrease of Rn at dump material (permeability) and water feeded fault , increase at solid rock

Fault marked by increase of H´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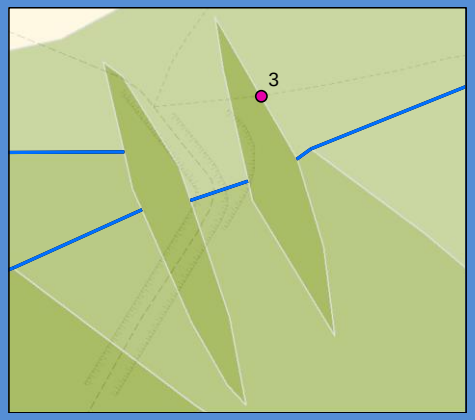
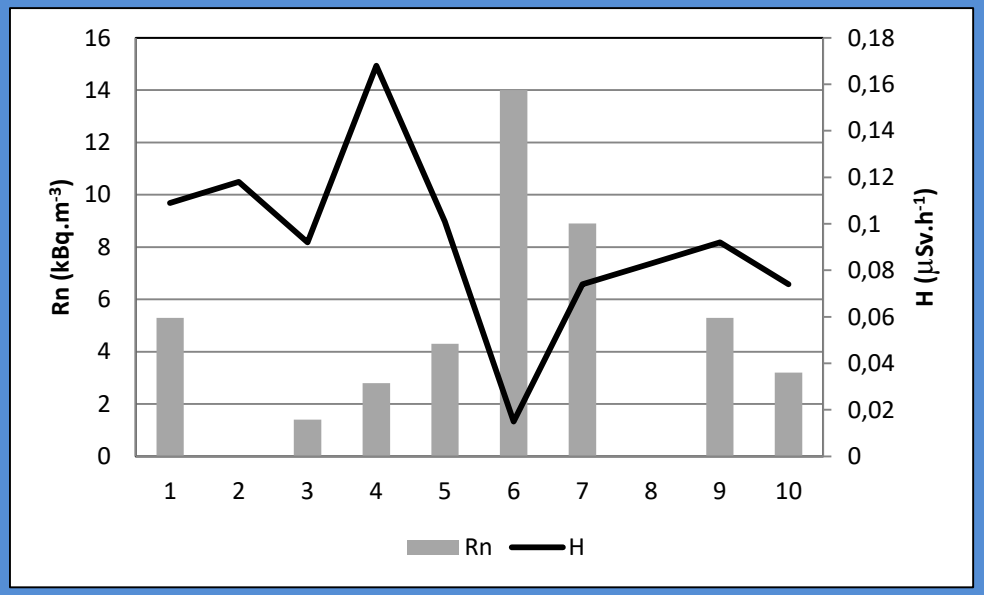
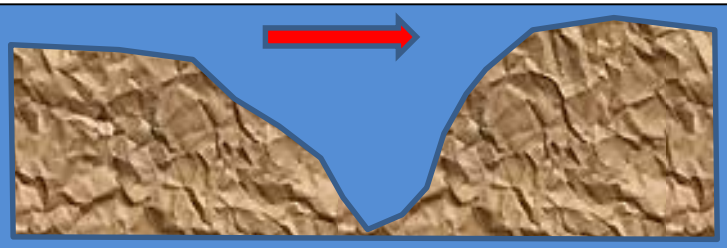


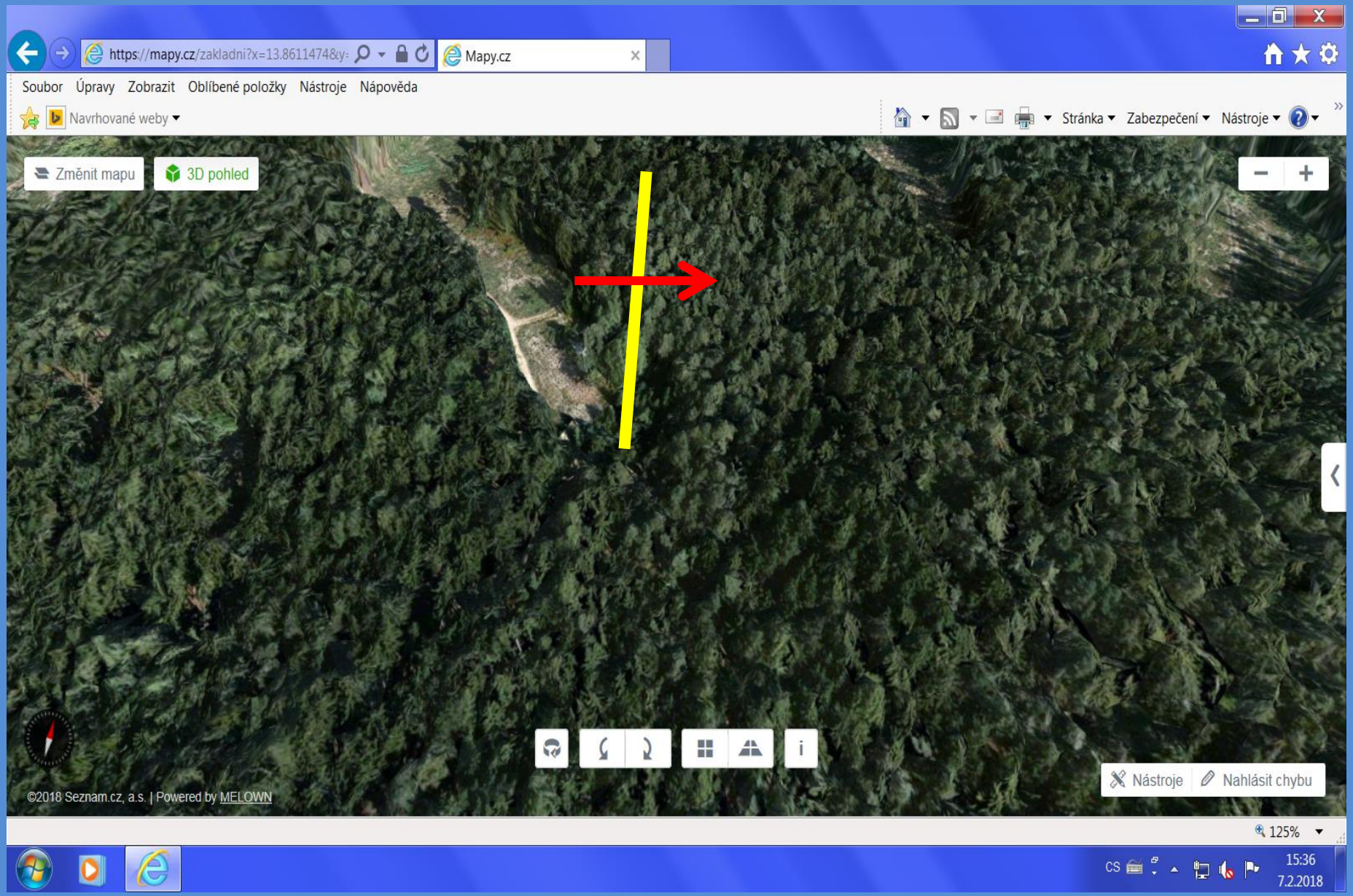




Locality Dagmar

Kaolin surface mining finished at 1935, relatively good-quality 90% of kaolin, use in metalurgy and ceramic industry

Fissures on the slope of Cambrian sediments are filled with weathered arcoses=source of kaolin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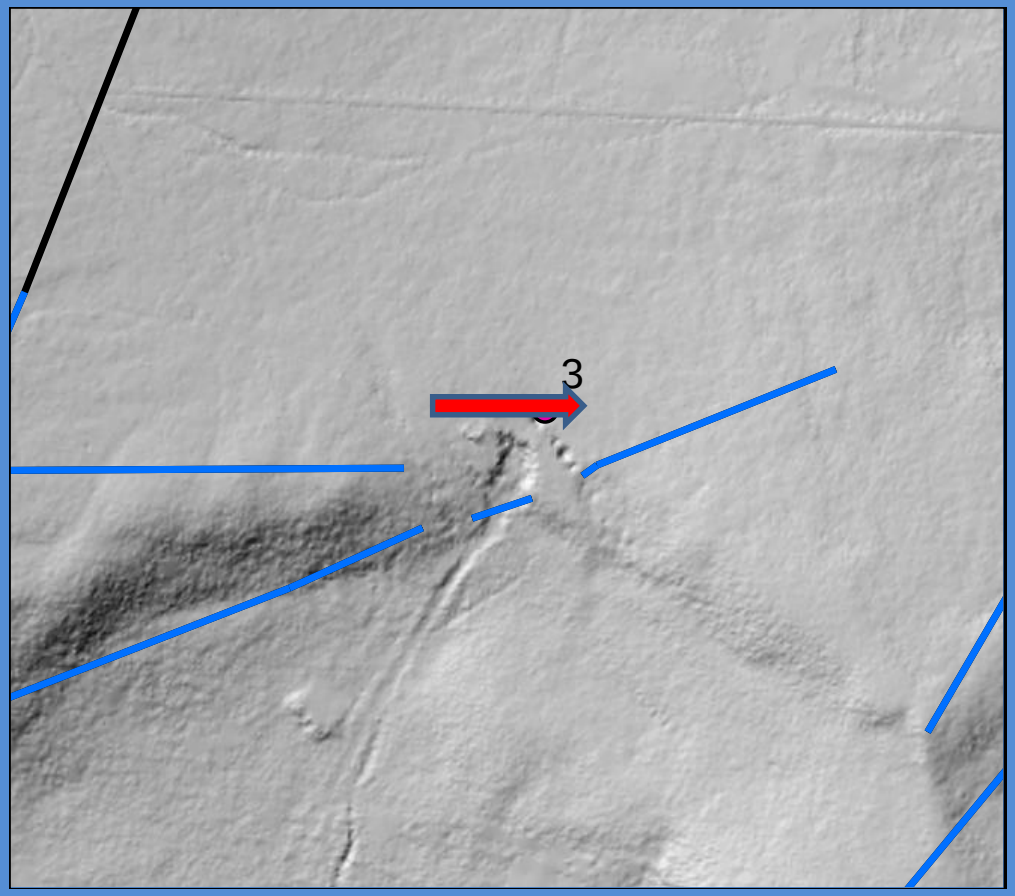
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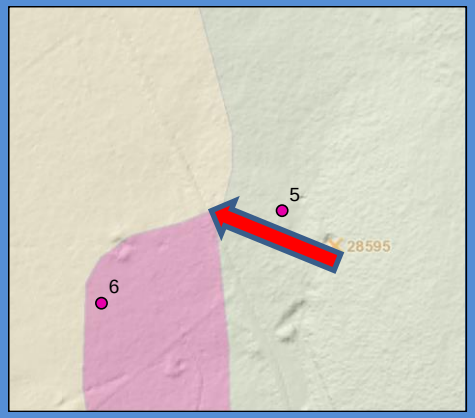


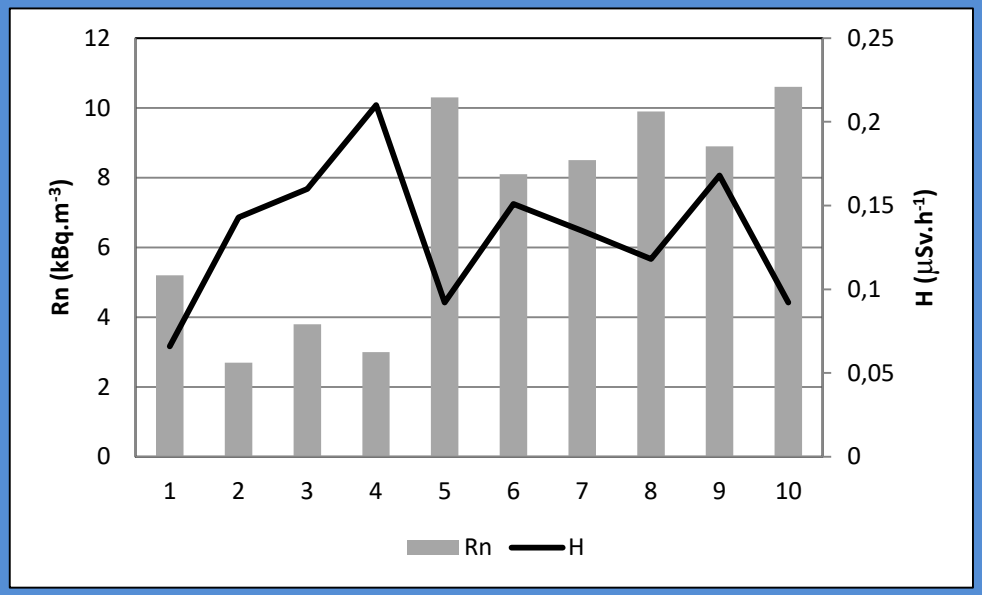
Sv. Trojice shaft

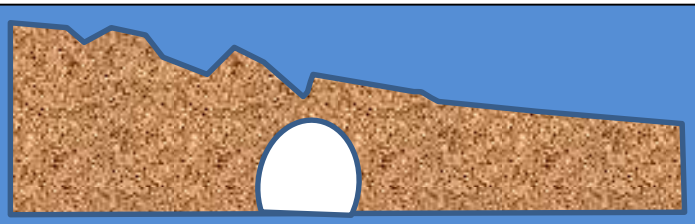
Medieval Fe mining (limonite)

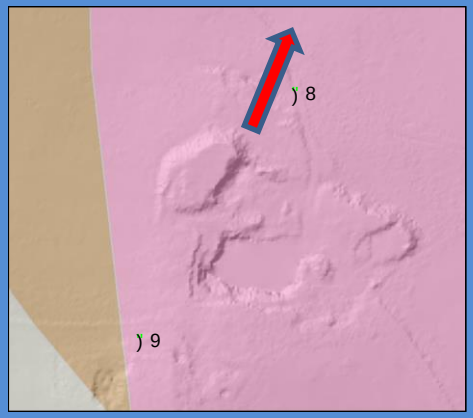
on the contact of metamorphosed

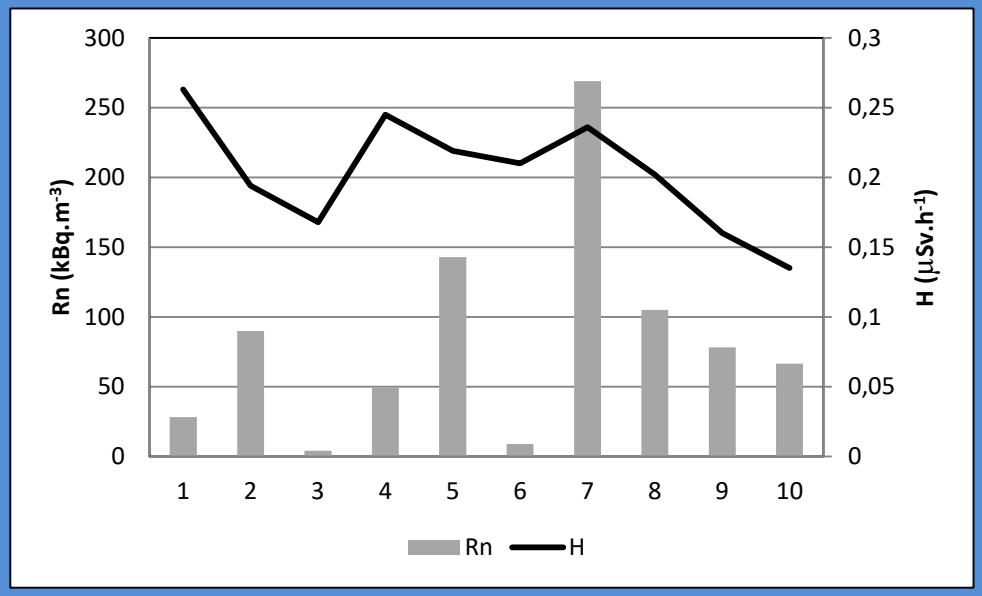
Cambrian sediments and granite,

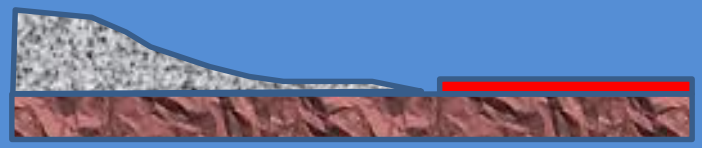
length of drainage adit cca 350 m











Bezděkov quarry

Abandoned granite

open pit quarry, low quality stone

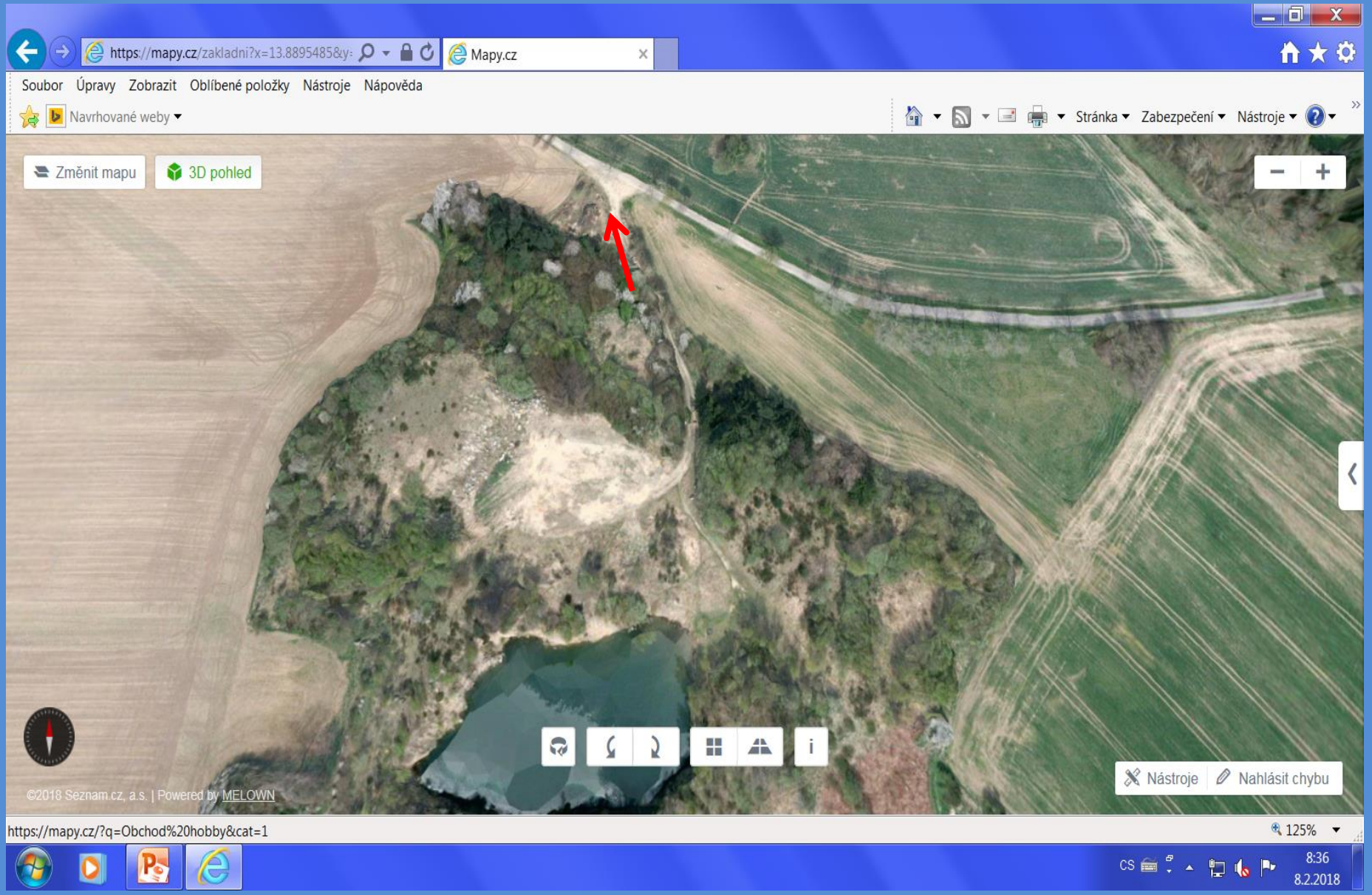
blocks and debris was deposited

around the pit

Rn increase can be observed

on the border of concrete panels

(in red, right part of profile)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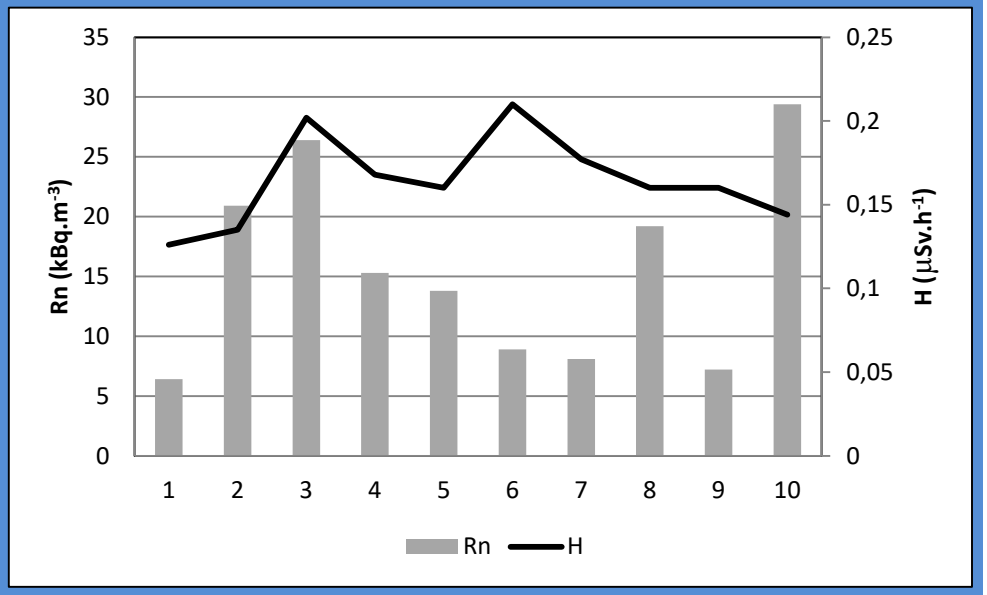
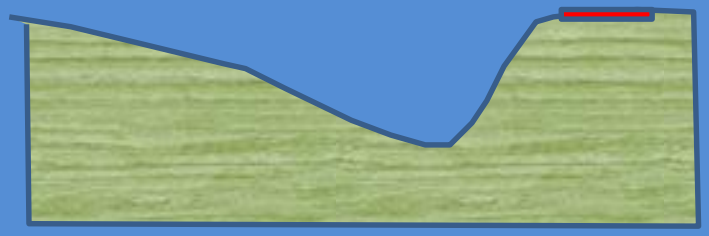




Zdaboř

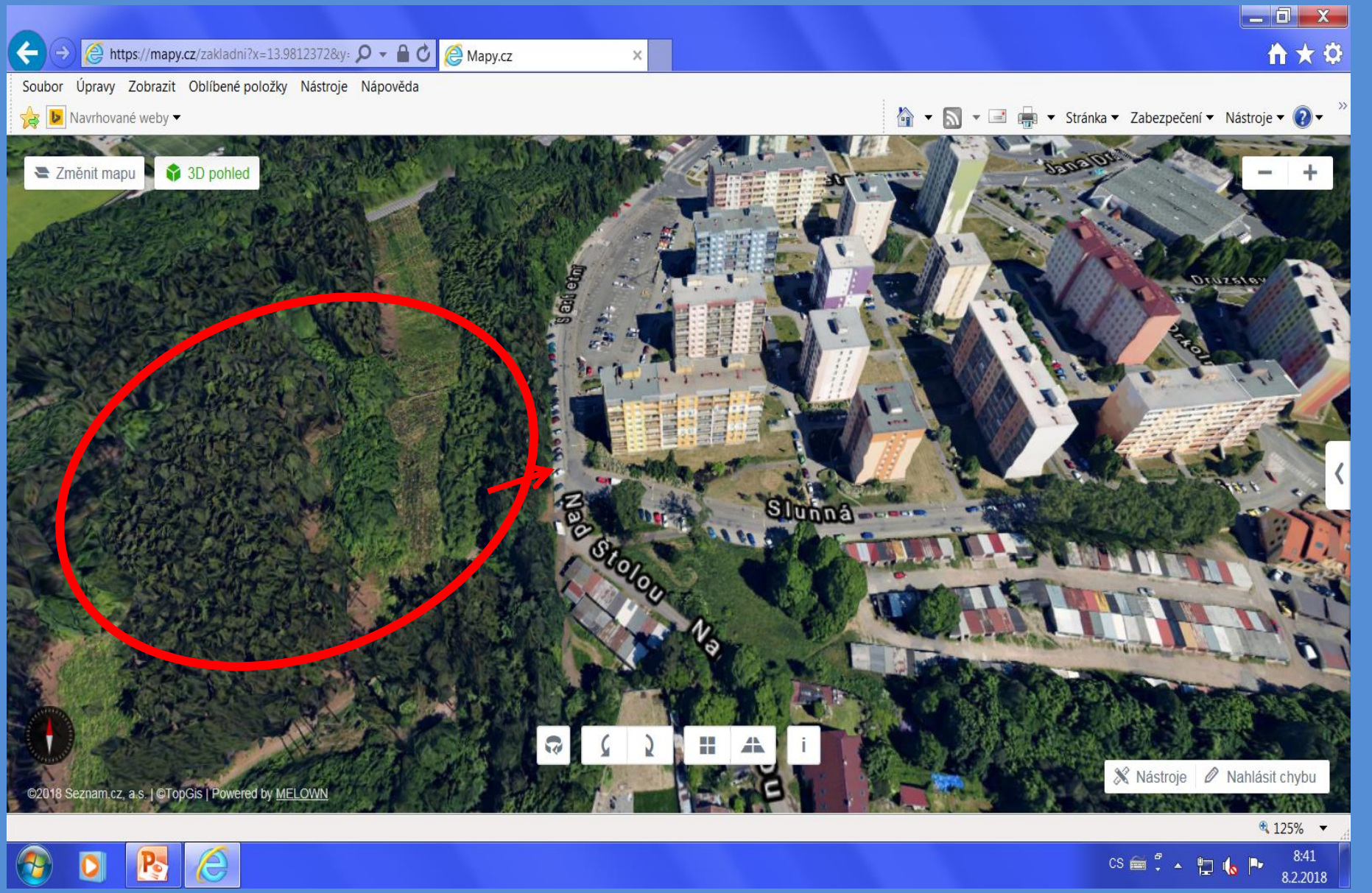
Profile across the sinkhole

-remnants of mining activities (19-20 cent.) in Cambrian greywackes and arcoses)

(polymetals Pb, Ag) Příbram district

small waste dumps

Rn increase at the contact with asphalt pavement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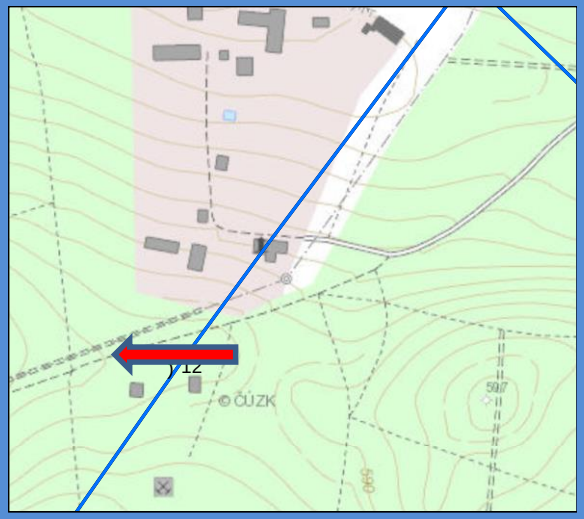
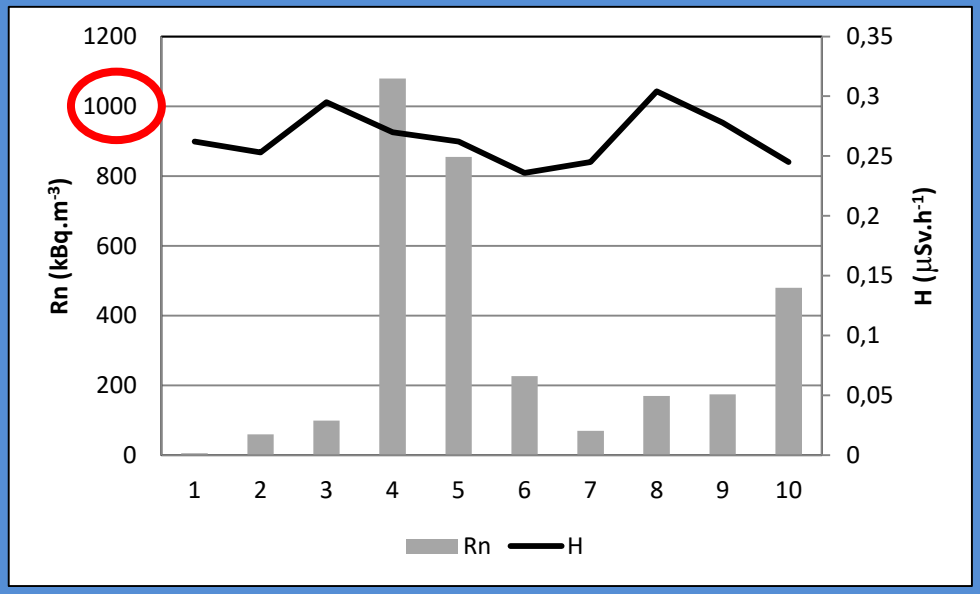




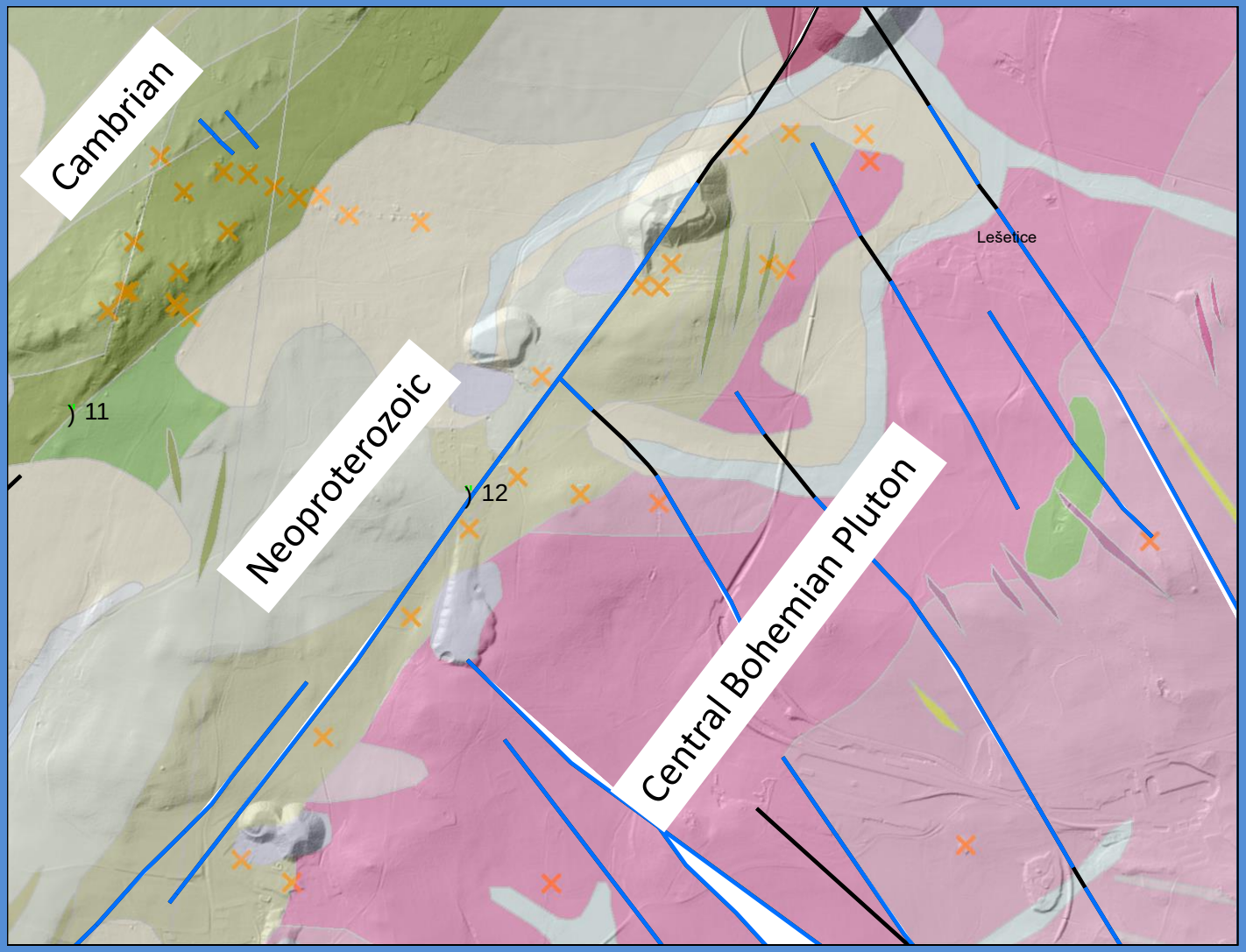
Vojna

The first U mine in Příbram area

(communistic concentration camp

1949-1961)

Present – exposition of Mining Museum Příbram


Cambrian
Neoproterozoic
Central Bohemian Pluton
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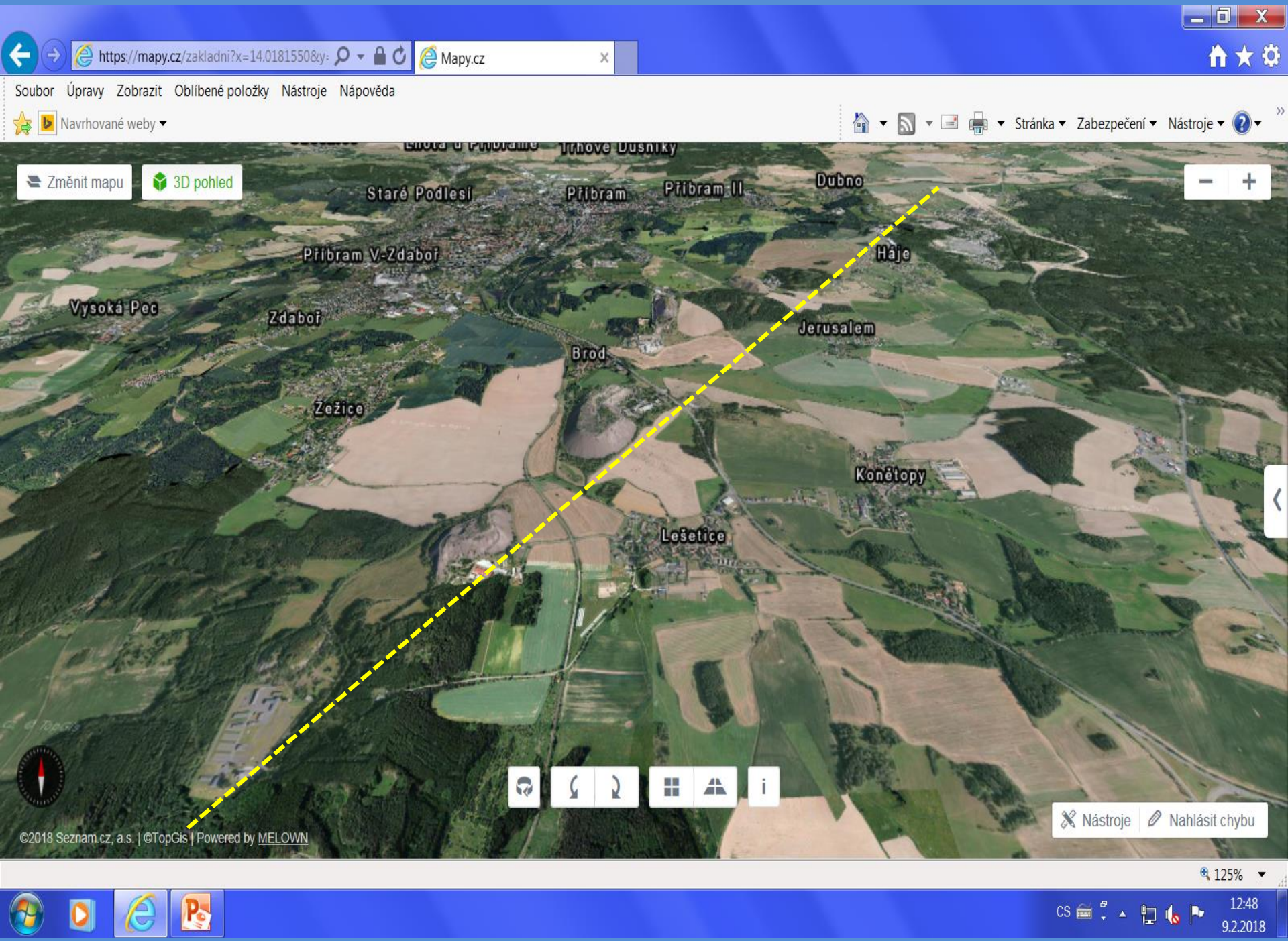
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Conclusions:

1. Different types of inhomogeneities were detected by Rn and H´ variations
2. Rn increase is dependent on the fragment size of the waste dump material . Growing size of fragments „ventilates“ radon into atmosphere, smaller size causes increased radon concentration
3. Level of H´values is dependent on the portion of clayey fraction in the waste dump material
4. Close vicinity of „plate-form insulators – asphalt, concrete panels“ causes Rn increase on its rims
5. Extraordinary high Rn concentrations were found at U mineralized fault even if remediated by inert rock material (metabazalt) – no H´ increase