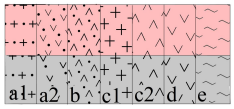
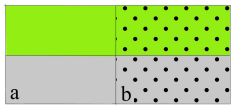
Hydrogeological caracterisation

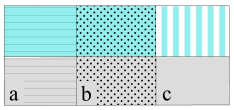
Mesozoic (a-limestones, b-dolomites, c-undivised) and Paleosoic (d-cristaline limestones and dolomites) carbonate series, highly fractured and karstified, characterised by very high effective infiltration and prevailing conduit porosity with intensive groundwater flow. Numerous karst system with various size and dominant binar type. Important water resources in large karst systems. Spring flow rate up to 550 l/s.



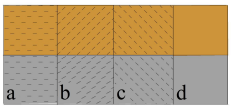
Paleozoic granites (a1) and rhyolites (a2), Mesosoic ophyolites (b), Laramian intrusive (c1) and volcanic (c2) magmatites, neogene volcanites (d) and metamorphites (e) with extensive fracture networcks and developed weathering zone which provides a continuous and important supply of rivers flow and of binary karst systems.



Prevalent molasse deposits (sandstones, conglomerates and less frquently argilaceous shales) with double porosity. The groundwater flow is mostly confined to the fissure and stratigraphic joints and less to the intergranular pores. At large thickness , they act as an impervious barrier for karst water reservoirs and frequently form the bedrock and/or the caprock for these. a- Permo-Mesosoic molasse, b-Upper Cretaceous cover and Miocene transgresive deposits.



Panonnian deposits: marls, argillaceous shales, sands, gravels (a), Holocene (b) and Pleistocene (c) deposits: sands, gravels, clays, hosting discontinuous water accumulations in the more permeable terms.



Marly and argillaceous deposite, devoid of groundwater flow, and flysch-like series, including rock-complexes of variable permeability (marls, argillaceous shales, sandstones, limestones), hosting occasionally discontinous aquifer accumulations, occuring in the more permeable terms, (a-Paleosoic; b-Upper Triassic - Early Jurassic; c- Tithonic-Hauterivian, d-Upper Cretaceous and Miocene).

Groundwater sources symbols

Source		Cold water	Thermal water (temperature in o C)			Water containing CO2	Still water
			Hypothermal, t=10-20	Mezothermal, t=21-36	Hyperthermal, t >36		
Spring		●	◑	◐		◍	⊖
Spring developed for potable water supply		◉					
Dugg well	perennial water	■				◫	
	temporary water	□					
Well		△	◭	◭	▲	◬	◬
Group of springs and wells		⧋	⧋	⧋		⧋	
Ebb and flow spring (intermitent spring)		ⓝ					
Degassing water (gas containing O2 and N2)		●	◑	◑			
Degassing water (gas containing CO2)			◒	◒			
Estavela		◔					

Hydrologic regime of cavity entrance

Cavity \ Hydrologic regime of cavity entrance	Perennial		Temporay		Absent	
	Source	Ponor (Swallow hole)	Source	Ponor (Swallow hole)	Tapping an underground stream	Fossil cavity
Cave	◙	⌂	◧	⌂	⌂ ⌂	∩
Pothole	▼	▽	▼	▽	⩛ ⩛	∨
Impenetrable	●	→)	◒	→»		

Explanation of lines and symbols

- Geological boundary
- Geological boundary of Quaternary deposits
- Geological boundary of magmatites
- Fault
- Thrust front (symbol on hanging side)
- Course of perennial stream (arrow indicates direction of flow)
- Course of temporary stream
- Limit of internally drainage area
- Limit between internally drainage areas
- Surface-water divide between drainage basins
- a — Karstic losses in river valley labelled with
- b — tracer (a-perennial flow downstream, b-seasonal flow downstream)
- Doline valley
- Proved underground hydraulic connexion
- Inferred underground hydraulic connexion

- Karst depression
- Summit
- a b — Foresty (a), touristic (b) chalet;
- Shepard
- Saddle
- Adit
- Meteorological station
- a b — Raingaugemeter (a), Water level recorder (b)
- Cave passage
- a b — Karst lake, a-perennial, b-temporary
- Cliffline (abrupt) ▽▽▽▽▽▽ Quarry
- Position of hydrogeological cross section
- Locality
- Road
- Footpath
- 5.45 / 200 / 0.27 — Flow gauging station with mean annual discharge in m3/s (top), catchment area in km2 (middle) and base flow index (bottom)

Fig. 1.6. Explanation of lines, symbols and colours used on the hydrogeological maps