



Geological report at the seismic station IV.VOBA – Vobarno (BS)

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Subject: Final report illustrating the geological setting for station IV.VOBA	



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1. INTRODUCTION

The geological description is related to the site of studied seismic station. The coordinates are reported in Table 1.

Table 1

CODE	NAME	LATITUDE	LONGITUDE	QUOTA (a.s.l.)
IV.VOBA	Vobarno	45.64292	10.50355	292
ADDRESS	Via A. Poli, 12, 25079 Vobarno BS, Italy			

2. TOPOGRAPHIC AND GEOLOGICAL INFORMATION

Topographic and morphological information related to the site are reported in Table 2. Table 3 summarizes all available geological maps from literature for geological analyses.

Table 2

Topography	Description	Class
	Flat surfaces, isolated slope and reliefs with slope $i \leq 15^\circ$	T1
Morphology	Description	Code
	Valley edge	VE

Table 3

Geological map	Source	Scale
IV.VOBA	Geological map of Italy sheet 048 (Peschiera)	1:100.000



In Table 4 Geological, Lithological and Lithotechnical Units (according to Seismic Microzonation classification; Technical Commission MS, 2015) are described and are concerned to maps of following chapters. The term “original” means the result comes from a preexisting cartography (Table 3); the term “deduced” means the result comes from an interpretation of a preexisting cartography according to the nomenclature of corresponding cartography.

Table 4

GEOLOGICAL UNITS (100k Geological map of Vobarno) <i>original</i>		LITHOLOGICAL UNITS (Amanti et al., 2008) <i>deduced</i>		LITHOTECHNICAL UNIT (MZS) <i>deduced</i>	
code	description	code	description	code	description
fg	Fluvial-glacial deposits	B3	Mixture of gravel and sand	GW	Mixture of gravel and sand



3. GEOLOGICAL MAP

In Figure 1 Geological Map is reported in a 1kmx1Km square around the station.

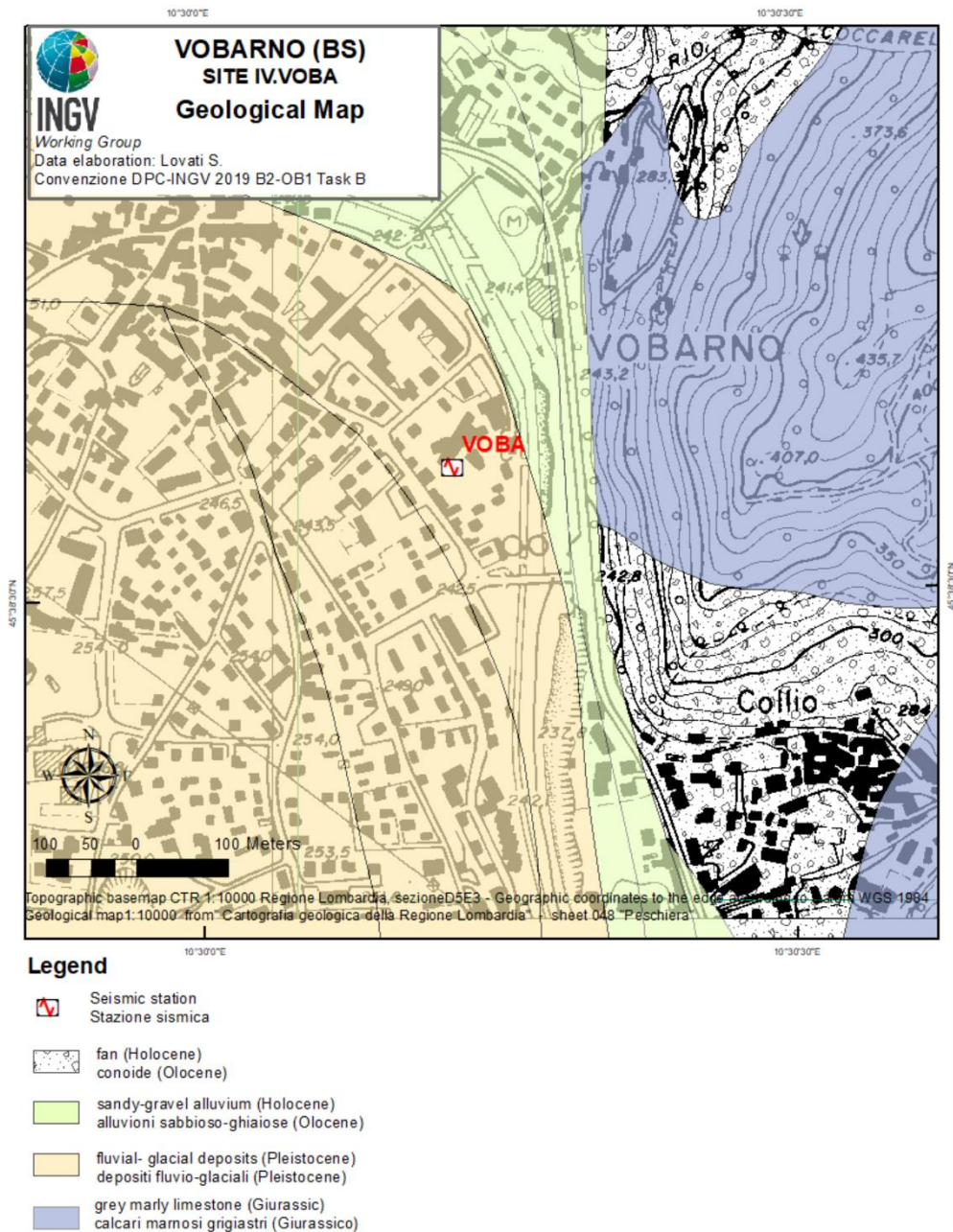


Figure 1. Geological map of seismic station IV.VOBA. Scale 1:5.000. Geological units are established according to the nomenclature of geological map of Italy 1:100000 (Sheet 048 Peschiera).



4. LITHOLOGICAL MAP

In Figure 2 Lithological Map is reported in a 1kmx1Km square around the station.

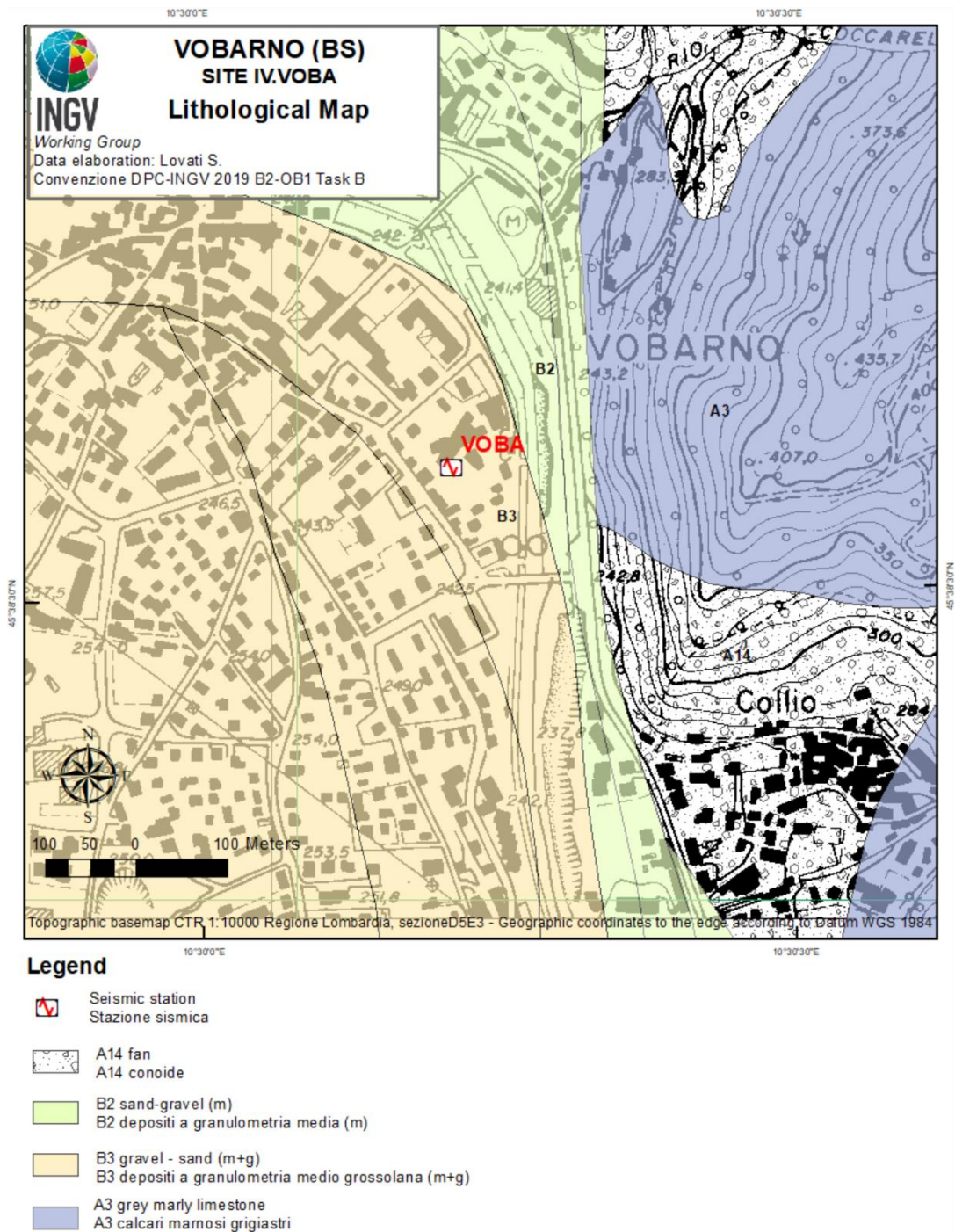


Figure 2: Lithological map of station IV.VOBA Scale 1:5.000. The codes of the lithological units are assigned according to the nomenclature of the Lithological map ISPRA 1: 100.000 (Amanti et al. 2008).



5. LITHOTECHNICAL MAP

In Figure 3 Lithotechnical Map is reported in a 1kmx1Km square around the station.

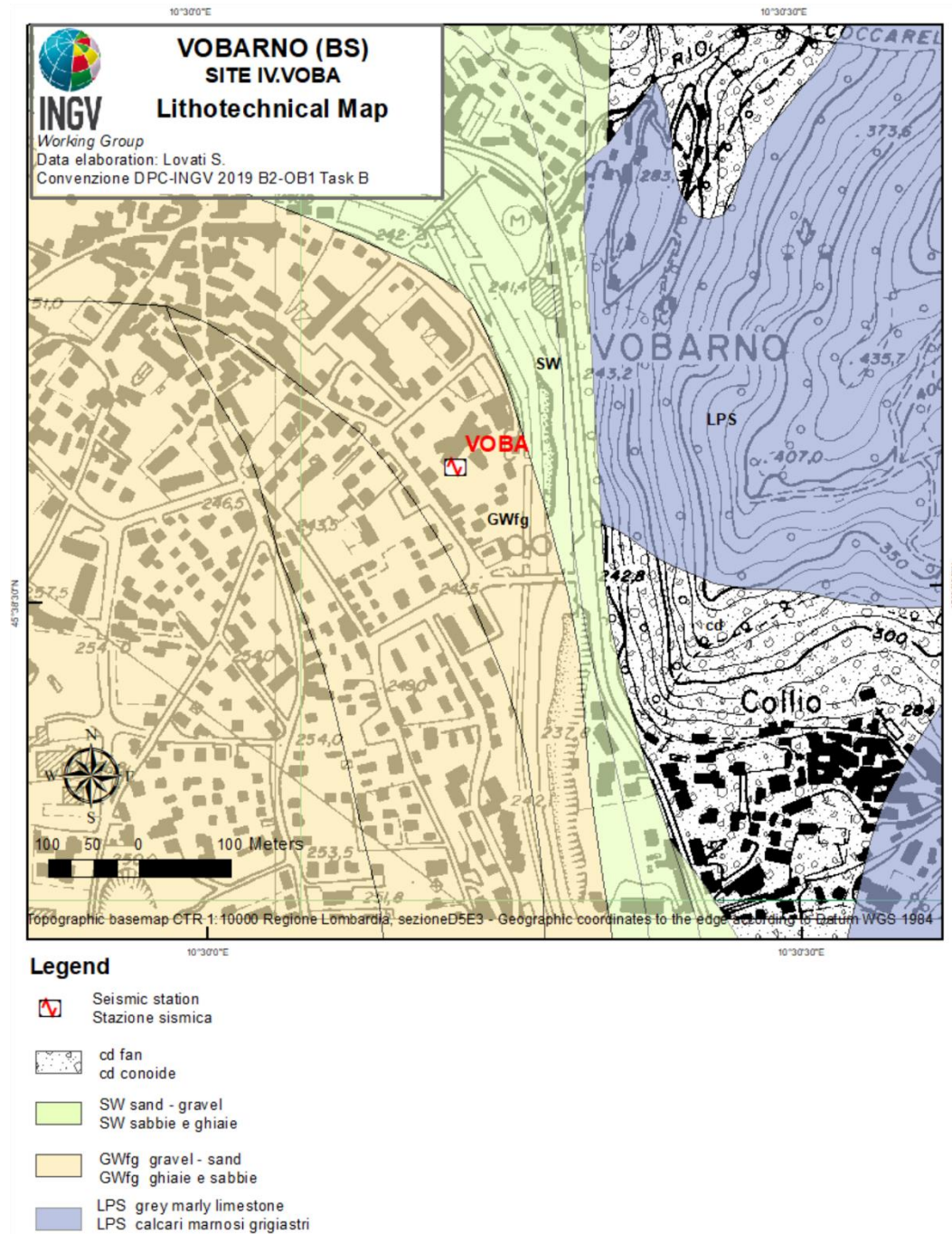


Figure 3: Lithotechnical map of the seismic station IV.VOBA Scale 1:5.000. The lithotechnical units are deduced according to the nomenclature of Seismic Microzonation (Technical Commission MS, 2015).



6. SURVEY MAP

Figure 4 shows the survey map reporting both previous investigations and new geophysics surveys conducted by the INGV Working Group.

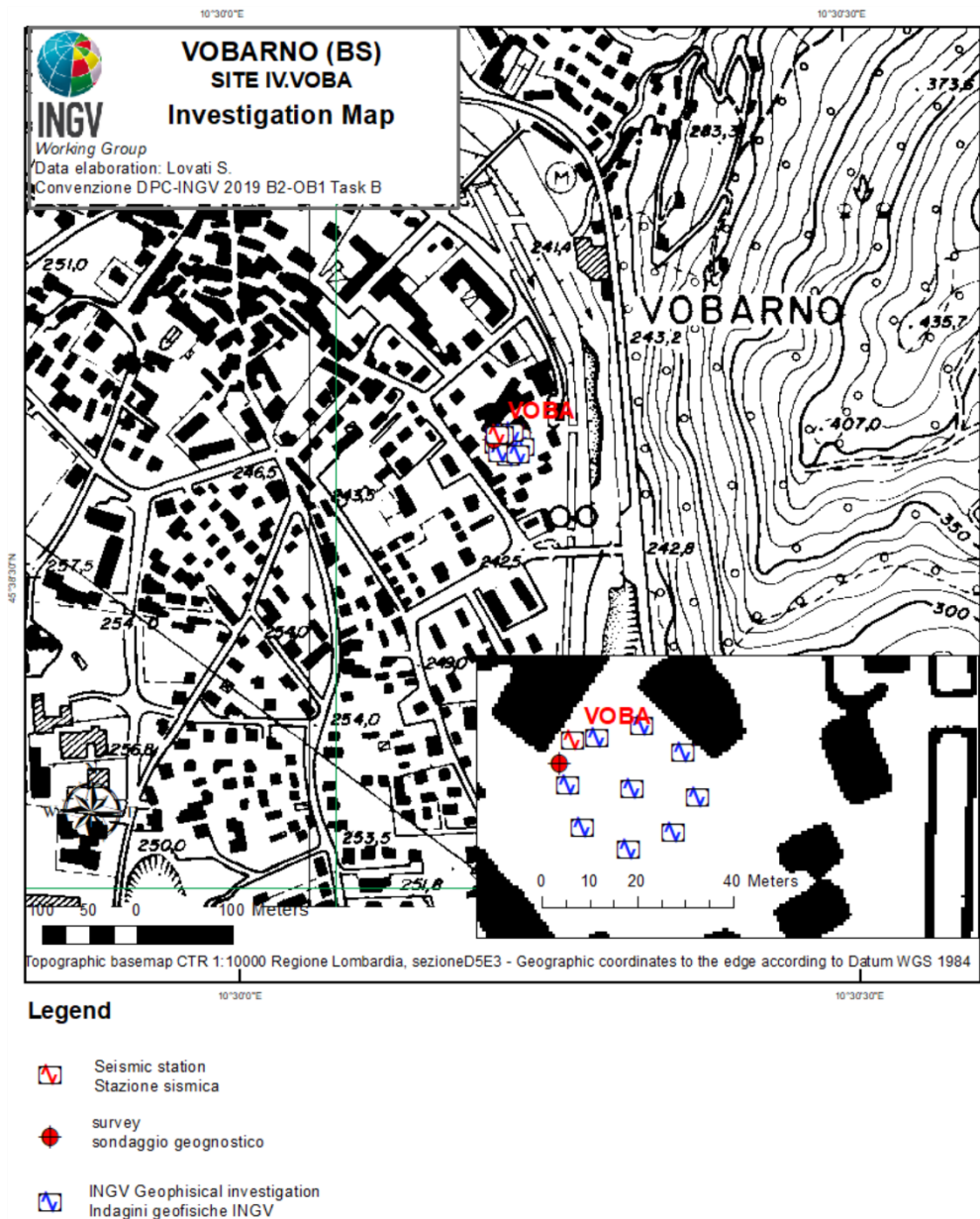


Figure 4: Map of the surveys in the surroundings of the station IV.VOBA Scala 1: 5.000. The box at the bottom right contains a zoom of the area with the detail of the geophysical 9-stations array conducted by the INGV Working Group for the seismic characterization of the site (Agreement DPC-INGV 2019, Allegato B2: Obiettivo 1 - TASK B, Velocity profile report IV.VOBA)



7. GEOLOGICAL MODEL

7.1 General description

The municipality of Vobarno (BS) belongs to Val Sabbia, elongated in the NNW-SSE direction. The territory is crossed by the wide valley of Chiese river, constituted by plain and terraced surfaces on which main villages established over time. From a structural point of view the area belongs to a tectonic system characterized by thrust following the compressions produced during the Alpine orogenesis. The rock formations are therefore affected by different dislocation systems. The succession of marine lithological units follows the general trend of “Sudalpino”. Indeed, the oldest formations emerge in the northern sector and are progressively replaced by more recent ones proceeding south-east. These units (from *San Giovanni Formation Carnic-* to *Colle San Bartolomeo Formation* – upper Miocene) constitute the bedrock and mainly consist of limestone, dolomitic rocks and marly limestone. The bedrock is covered by Quaternary continental deposits which formation is due to morphological processes.

7.2 Geological Section

A schematic geological section A-A' crossing the IV.VOBA seismic station from W to E (Figure 5 bottom) is shown.

On the right of the section, a steep slope, made of grey marly limestone (Giurassic) connects to the bottom of the valley, where 25 - 30 m of fluvial-glacial deposits (Pleistocene) are present. Although with some uncertainty, it was possible to trace the limit between rock (limestone) and fluvial glacial deposits under the seismic station IV.VOBA thanks to a 40 meters survey available in the court of the school where the INGV geophysical investigation (9-stations array) was performed.



7.3 Subsoil model

For this reason a good subsoil model is built up to a depth of about 40 m in the area around the IV.VOBA station (Figure 5 right).

The stratigraphy shows an alternation of fluvio-glacial deposits with predominant gravel and sand, and minor yellow-clay, down to 27 m in depth where fractured limestone rock is observed. The massive limestone, probably belonging to the Giurassic succession, follows at 34 m in depth.

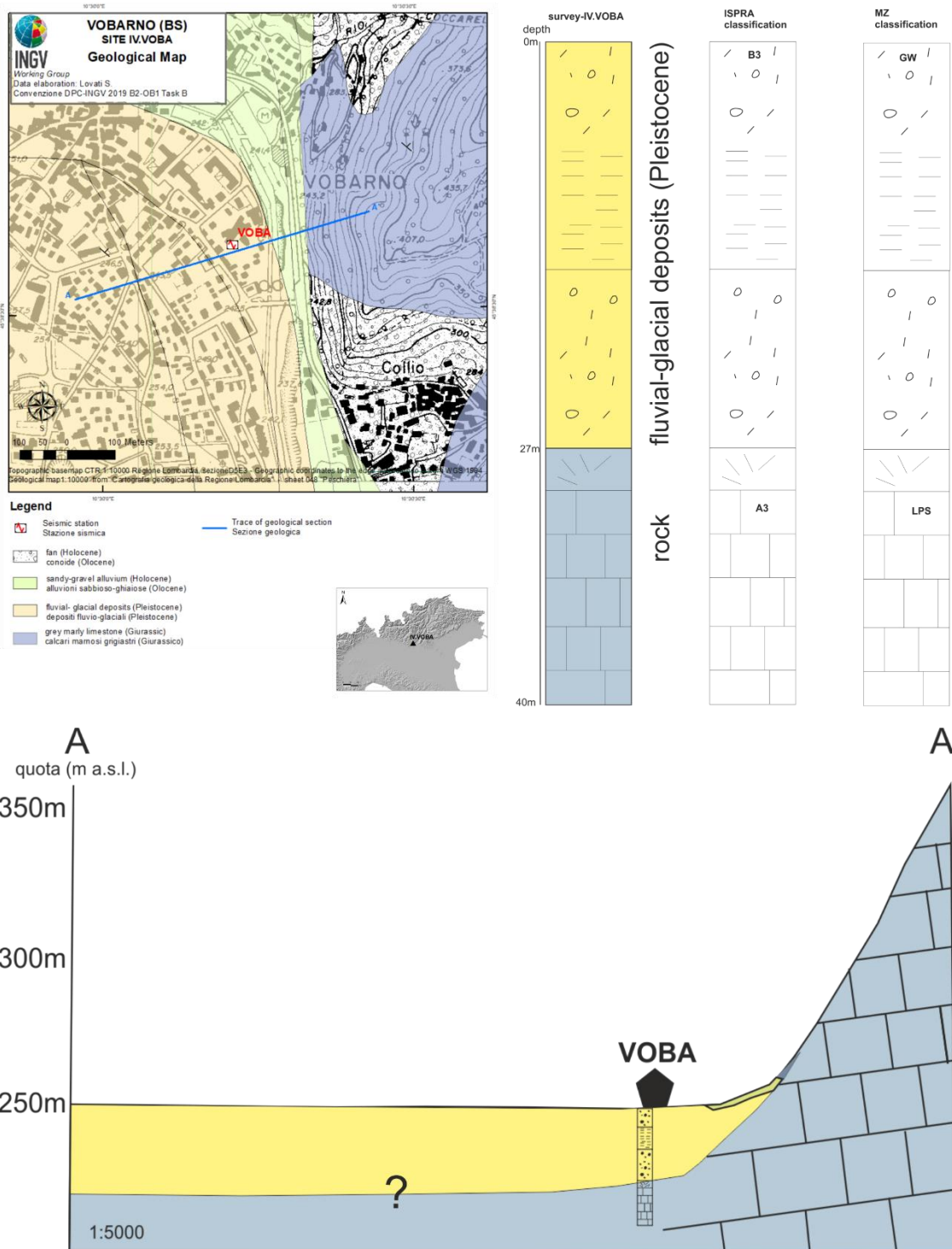


Figure 5: Bottom: Geological section A-A' crossing seismic station IV.VOBA. Right: Subsoil model under the IV.VOBA seismic station and classification according to **ISPR**: B3: mixed gravel and sand, A3: marly limestone; according to **MZ**: GW: mixed gravel and sand, LPS: rock.



8. REFERENCES

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