

Utilization of salt caverns in Albania for the underground storage of natural gas arriving from Trans-Adriatic Pipeline

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Introduction

The first gas discovery in Albania happened in the Tortonian Sandstone Layers of Divjaka in 1963. The peak gas production was 0.937 billion m³/year (1982). Actually, Albania is a country that is not connected to any interstate gas transmission system. The existing pipelines connecting all gas fields have a total length of 410 km, are old and in poor conditions.

In the present work the possibility of storing the NG in the underground caverns of Dumrea region, is carried out. The underground caverns will be developed in rocky salt deposits having a high thickness. They will be utilized to meet the national objective to cover the gas demand for a 3-months time period.

Materials and methods



One of the potential options is Dumrea region, which is situated in Central part of the country.

The region with its salt domes formation covers a surface area of 250 km² and forms a considerable gas underground storage.

The salt deposit is situated at a depth of 2000 m. The overburden is karstic to a large extent and consists of gypsum anhydrite. The salt reaches down till the depth of 6000 m. The salt volume is estimated around 1400 km³.

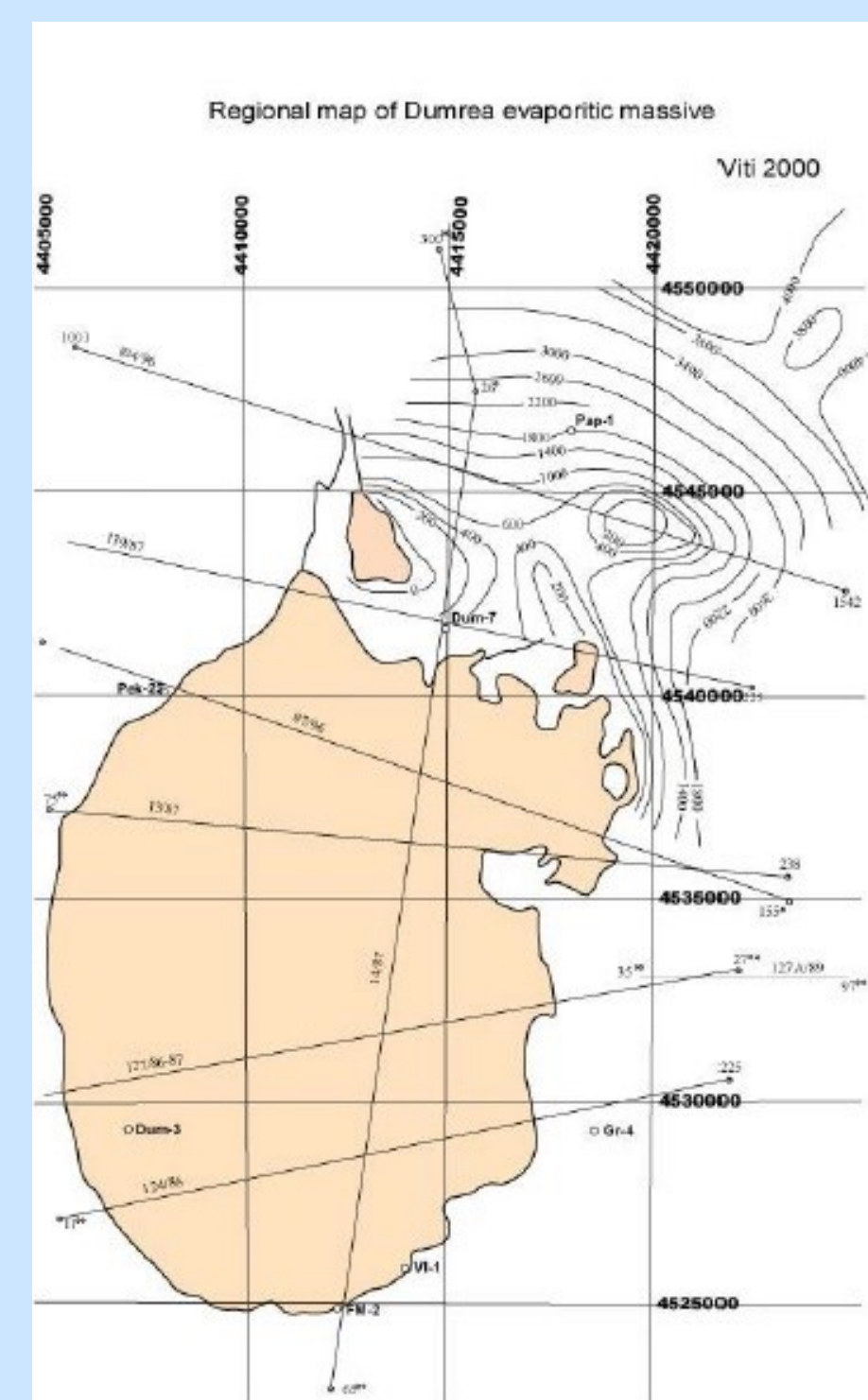


Figure 2. The natural underground natural gas storage in Dumrea region

Since November 2020, the TAP is operational in Albania. Another pipeline named IAP (Ionian Adriatic Pipeline) is foreseen to be build. It will have a transiting capacity of 5 billion m³ and will connect Albania and Croatia.

The caverns will have a connection with TAP (Trans-Adriatic Pipeline), where the NG will be extracted. The connection point is foreseen to be in the ABV30, which is the valve station in Dimal. The connection gas pipeline is nearly 14.5 km long.

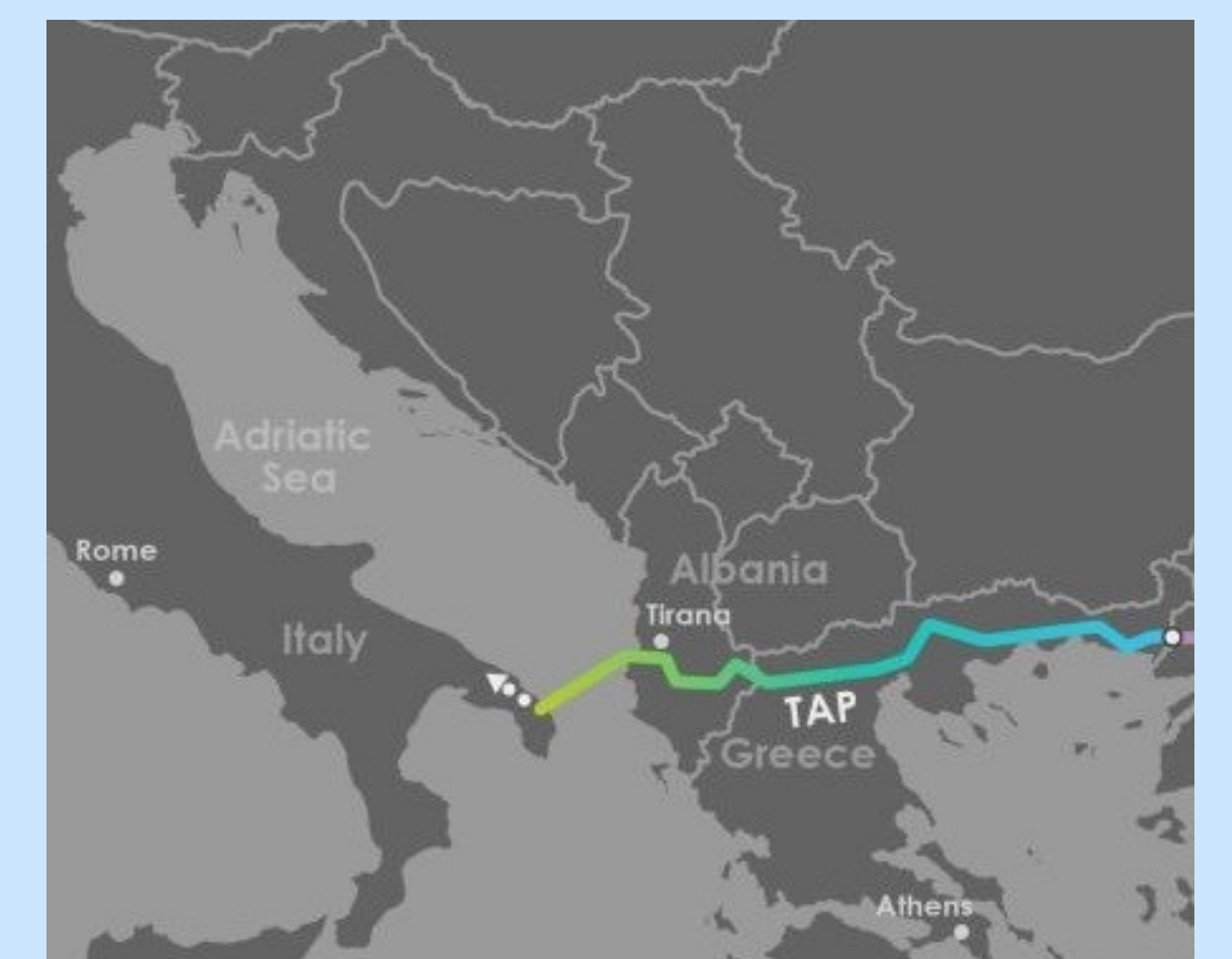


Figure 3. Trans-Adriatic Pipeline in Albania

Figure 1. The location of the underground natural gas storage of Dumrea towards pipelines

There are 2-options:

Option 1: UGS Dumrea VL-1 with the objective to cover the national needs of 184 million m³/year. It is foreseen to leach 2-caverns having a diameter of $\varnothing = (55-60)$ m. The total capacity will be 230 million m³/storage. The withdrawal rate is foreseen around 1.29 million m³/day. The investment is estimated around 78 million €.

Option 2: UGS Dumrea VL-2 with the objective to cover the national needs + regional and transit gas markets. It is foreseen to leach 8-caverns having a diameter of $\varnothing = (70-80)$ m. The total storage capacity is foreseen till 1.2 billion m³. The withdrawal rate is foreseen around 6 million m³/day. The investment is estimated around 150 million €.

UGS will support and increase the flexibility of the gas transmission system in the region (Montenegro, Croatia, etc.).

Based on the analysis of Offer/Demand, it is estimated that Dumrea Underground Storage will have:

- an injecting capacity of 113000 m³/h, and
- an extracting capacity of 190000 m³/h.

The proposed deposits will include:

- a) the underground salt part, and
- b) the necessary plant for the security, filling and delivering purposes.

UGS Dumrea will include:

- 1) gas station;
- 2) measurement station;
- 3) electric substation;
- 4) VL-1 well area;
- 5) VL-2 well area;
- 6) pumping station for the required water;
- 7) pipelines for gas collections;
- 8) water ways for soft and salt water, and
- 9) internal infrastructure between the gas station and gas wells.

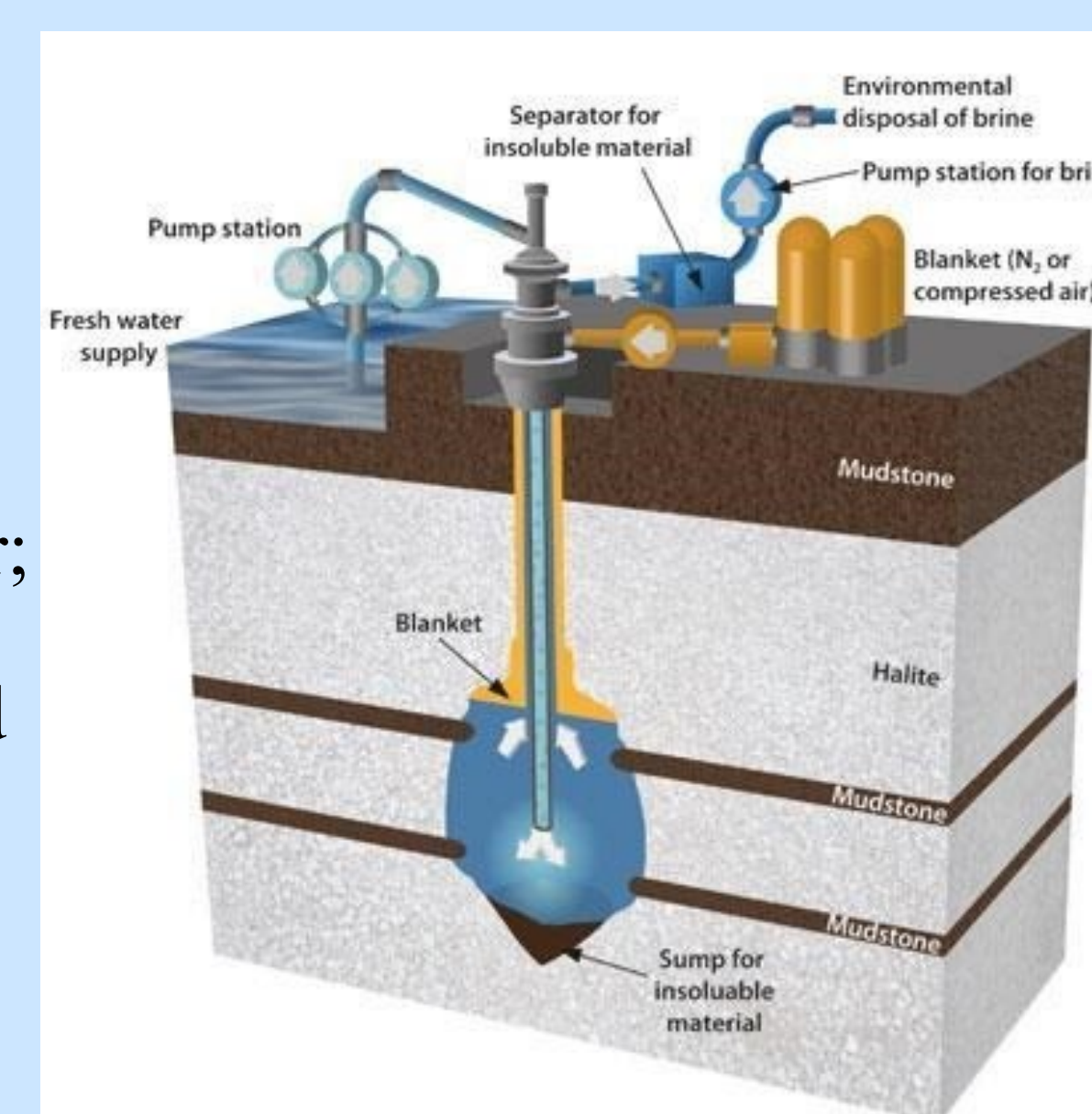


Figure 4. Main components for UGS Dumrea

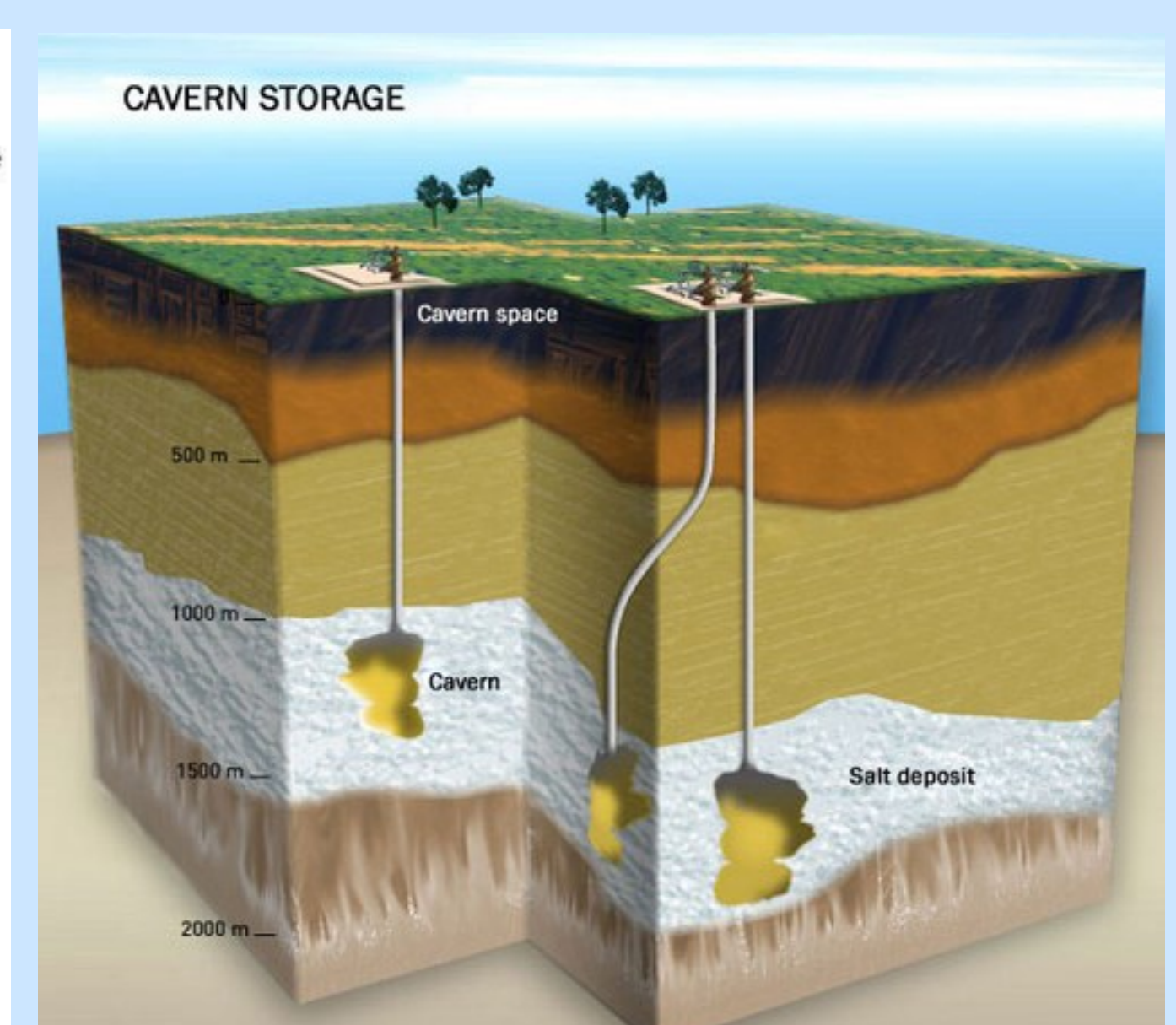


Figure 5. Proposed composition for UGS Dumrea

Results and Conclusions

Underground gas storages in Dumrea region will provide:

- the possibility of gas supply for end-users in the country from TAP;
- the possibility to cover the peak demand for neighboring countries, also;
- the possibility for developing a gas market;
- the reduction of the gas supply costs for end-users;
- a flexibility between the offer/demand;
- the possibility to offer regional gas storages, even for neighboring countries, and
- an alternative supply for the neighboring countries with Natural Gas arriving from the Caspian region.

Acknowledgement

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