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COMMITTEE ON SUSTAINABLE ENERGY

Working Party on Gas

Ad Hoc Group of Experts on the
Supply and Use of Gas

**USE OF HORIZONTAL WELLS
IN UNDERGROUND GAS STORAGE**

(Draft questionnaire, transmitted by the Government of Hungary) */

Please review the questionnaire and send your comments to the General Rapporteur, Mr. Laszlo FICSOR, Hungarian Oil and Gas Company, MOL, Tel. (+36 1) 464 16 20; Fax: (+36 1) 464 47 74 and e-mail: lficsor@mol.hu, with a copy to the secretariat, by 2 October 2000.

*/ In accordance with the decision of the Ad Hoc Group of Experts taken at its first session in January 2000.

USE OF HORIZONTAL WELLS IN UGS	Existing UGS	Planned UGS
1.Type of underground storage		
1.1 Depleted hydrocarbon layers		
1.2. Aquifer		
2. Type of reservoir rock		
2.1.1. Consolidated		
2.1.2. Unconsolidated		
2.2.1. Sandstone		
2.2.1.1. Aeolian		
2.2.1.2 Fluvial		
2.2.1.3. Deltaic		
2.2.1.4. Shallow marin		
2.2.2. Dolomite		
2.2.3 Others		
3. Data of reservoir		
3.1. Average depth of the reservoir (m)		
3.2. Average thickness of the reservoir (m)		
3.3. Thickness of the reservoir in the horizontal section (m)		
3.4. Maximum pressure (bar)		
3.5. Minimum pressure (bar)		
3.6. Temperature of the reservoir (C)		
3.7. Wellhead temperature (C)		
3.8. Permeability:Kh/Kv		
4. Bottomhole differential pressure		
4.1. Maximum usable pressure (bar)		
4.2. Average usable pressure (bar)		
5. Maximum usable flow velocities during withdrawal		
5.1. In the tubing (m/s)		
5.2. In the flowline (m/s)		
6. Downhole equipment completion		
6.1. Open hole		
6.2. Cased, cemented and perforated		
6.3. Slotted liner		
6.3.1. Expandable		
6.4. Sand screen		
6.4.1. Expandable		
6.5. Gravel pack		
6.6. Both (6.4. & 6.5.)		
6.7. Other		

USE OF HORIZONTAL WELLS IN UGS	Existing UGS	Planned UGS
7. Function		
7.1. Injection (pcs)		
7.2. Withdrawal (pcs)		
7.3. Injection/withdrawal (pcs)		
8. Drilling		
8.1. Vertical well (pcs)		
8.2. Reentry (pcs)		
8.3. New horizontal well (pcs)		
9. Withdrawal capacity/peak out rate		
9.1. UGS		
9.1.1. Max. withdrawal rate (Mm3/day)		
9.1.2. Max. withdrawal rate of horizontal wells (Mm3/day)		
9.2. Horizontal well		
9.2.1. Average max. withdrawal rate (Mm3/day)		
9.2.2. Relative av.max. withdrawal rate (vertical well = 1)		
10. Investment cost (average)		
10.1. New horizontal well (USD)		
10.1.1. Relative investment cost of 10.1. (vertical well=1)		
10.2. Reentry (USD)		
11. Geometry		
11.1. Average depth of kick off point (m)		
11.2. Turn radius		
11.2.1. Short (pcs)		
11.2.2. Medium (pcs)		
11.2.1. Long (pcs)		
11.3.1. Max. drain hole length (m)		
11.3.2. Min. drain hole length (m)		
11.4.1. Max. hole size in pay zone (inch)		
11.4.2. Min. hole in pay zone (inch)		
12. Average age of horizontal wells (years)		
13. Problems		