

# Hydrogen and CAES Storage Cavern Development in Canadian Salt Deposits - Optimizing Cavern Design and Estimating Performance

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## Summary

Solution-mined caverns in halite rock salt formations have a long history of storing hydrocarbon liquids and gases owing to rock salt's low permeability and useful mechanical and chemical properties. These properties also make salt caverns highly suited for large scale gaseous hydrogen storage and compressed air energy storage (CAES). This article provides a technical introduction to hydrogen storage and CAES in solution-mined salt caverns to support new cavern development for the energy transition. Factors relevant to prefeasibility-stage storage cavern design such as cavern well design, cavern field design, and solution mining design criteria, including cavern interval and diameter, are explored in practical detail. Generalized storage cavern performance parameters, such as gas pressures and capacities, are provided for a range of cavern design factors common in Canadian salt formations. This helps those exploring new cavern development projects supporting green energy set expectations for cavern storage parameters.