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**Technical
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Paper**



**Product Conversions in Brine Displacement Caverns
in Fort Saskatchewan, Alberta, Canada –
Challenges and Successes**

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PRODUCT CONVERSIONS IN BRINE DISPLACEMENT CAVERNS IN FORT SASKATCHEWAN, ALBERTA, CANADA – CHALLENGES AND SUCCESSES

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Abstract

Plains Midstream Canada ULC (Plains) operates several dozen natural gas liquids (NGL) storage caverns in Alberta, Saskatchewan, and Ontario, Canada, as well as in Michigan and Arizona, USA. These caverns store a variety of NGL products, including ethane, propane, butane, condensate, and mixed NGLs. These refined products must all adhere to rigorous quality specifications.

This paper presents an overview of Plains' cavern flushing activities at our storage and fractionation facility in Fort Saskatchewan, Alberta, as well as a framework for future conversions.

Plains operates several salt caverns at our Fort Saskatchewan facility within the bedded salt of the Lotsberg formation. Occasionally, for commercial purposes, there is a requirement to change the product type stored within a specific cavern. Depending on the shape of the cavern roof and neck, this can pose several challenges related to the product conversions, primarily related to emptying the cavern and maintaining the specifications of the new product being stored.

Success has been achieved by developing specific flush plans for individual caverns to help mitigate the contamination impact of residual trapped product. The flushes effectively displace or dilute any product that may be trapped within the roof cavity.

Plains has recently successfully executed three cavern flushes, with another planned for the near future. Plains has been able to effectively execute cavern flush strategies, to improve the way the caverns operate, within both commercial and operational requirements of the business.

Key words: Flush plan, product conversion, mass balance, cavern shape, sonar, Fort Saskatchewan, Alberta, Canada, product specifications, cavern development, solution mining modelling.