

Executive Summary

The draft Water Conservation Policy for Upstream Oil and Gas (October 2016) requires that the energy industry consider alternative water sources for operations use, when accessible, with the objective of minimizing industry use of high quality non-saline (HQNS) water. As the Alberta energy industry works to reduce HQNS water use, there is growing interest in transporting alternative fluids, including produced and flowback water (referred to as produced water, for simplicity) using temporary surface conveyance materials. Currently, layflat temporary hose (layflat) is considered to be of high interest for the industry, although there is openness to explore additional temporary surface conveyance materials. Layflat can eliminate truck traffic in rural communities, reduce emissions, and lower water management costs for operators. However, Alberta operators are currently unable to transport produced water in layflat for several reasons.

WaterSMART Solutions Ltd. (WaterSMART) was retained by the Canadian Association of Petroleum Producers (CAPP), under the Alberta Upstream Petroleum Research Fund (AUPRF), administered by the Petroleum Technology Alliance Canada (PTAC), to perform research to support future efforts to enable transportation of produced water via layflat in Alberta. CAPP will be presenting recommendations to the Alberta Energy Regulator (AER), sourced from this research, which are expected to inform policy, guidelines, and processes for the use of layflat to transport produced water.

This report includes a review of previous PTAC work relevant to transporting produced water; research into Alberta, British Columbia (B.C.), Colorado, and Texas to compare their regulatory mechanisms, risks related to transporting produced water, and approaches to risk mitigation (including common materials); and recommendations for the AER to improve the regulatory environment in Alberta to enable the transportation of produced water. At the direction of industry representatives (coordinated through PTAC), the research is focused on transportation of produced and flowback water via temporary layflat hose, although the recommendations provided are broadly applicable to all alternative water sources. Furthermore, it is recognized that temporary surface conveyance materials besides layflat may be explored by the industry.

The review of relevant PTAC projects reveals how successive projects built on each other to provide an understanding of current regulatory barriers and assess possible avenues for reducing them. The current definitions-based regulatory approach can limit reuse of alternative water. For example, produced water, classified as a non-hazardous oilfield waste, has restrictions placed on storage, which impacts the economics of broad reuse. Building on this, efforts were made to understand how transportation materials can be developed to safely transport produced water. This informed proposals for a risk-based regulatory environment, whereby risks associated with produced water transportation can be identified and appropriately mitigated.

For the review of Alberta, B.C., Colorado, and Texas regulatory environments and operational practices, desktop research was supplemented by conversations with several of our colleagues who have extensive

operational and regulatory experience in hydraulic fracturing throughout North America. Generally, regulations focus on minimizing the risk of leaks and spills during transportation. Common challenges include small leaks (e.g. at pumps, connection points, and pinholes); vandalism; material durability; and issues with freezing.

High density polyethylene (HDPE) pipe was identified as the most common material for produced water transport, as this meets the required engineering standards in each jurisdiction. None of the jurisdictions reviewed appear to use traditional layflat for the transportation of produced water outside of lease boundaries. In B.C., spoolable reinforced thermoplastic pipe is being used to transport produced water off lease in some cases, with strict mitigations and licence conditions.

Based on the desktop research and conversations within our network, and building upon past PTAC work, WaterSMART has prepared recommendations to inform future policy, guidelines, and processes for transporting alternative water (including, but not limited to, produced and flowback water) via temporary layflat hose. These recommendations aim to balance the needs and wants of both industry and the AER while accounting for economic, operational, practical, and environmental factors.

Overall Recommendation: The AER should transition from a definitions-based system for regulating the transfer of alternative water towards a blended risk-based approach which provides clear guidance to project proponents for assessing risks for high risk activities while allowing for rapid approval of designated activities which have sufficiently low risk and/or existing prescriptive guidance (e.g. standards, codes of practice, etc.).

It is envisioned that an application will be categorized as either a “Designated Activity” or “Higher Risk Activity”. Automatic initial screening of projects could be included in the AER’s existing OneStop platform for integrated applications. Each category of activities will have its own approval pathway, which will be commensurate with the category’s risk. Note that this approach is envisioned as a dynamic system. Over time, as more Higher Risk activities are reviewed and approved, the mitigations and conditions necessary to enable approval can be formalized into prescriptive guidance, which will expand the list of Designated Activities. Piloting, which has been demonstrated in B.C., may be an effective tool for the AER and industry to develop acceptable mitigations and new prescriptive guidance. This approach requires both industry and the AER to think seriously about their respective tolerances for risks and appropriate ways to mitigate them.

It must be noted that recommendations to improve the regulatory environment for transportation of alternative water only address some of the challenges preventing operators from utilizing more alternative water. Storage is a critical component of alternative water use and reuse plans, and the economics of alternative water transportation in Alberta (via any means) are often challenged by how much operators can store. It is recommended the AER consider similar efforts to update the regulatory environment for produced water storage.