

Joslyn Creek SAGD: Geologic Factors Related to a Surface Steam Release Incident, Athabasca Oil Sands Area

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Summary

On May 18, 2006, a surface-steam release incident occurred at the Total Joslyn Creek SAGD operation in northeastern Alberta, about 60 km north of Fort McMurray. There were no injuries or loss of life, no consequences to wildlife, and no public impacts. The ERCB staff conducted a nearly three-year multidisciplinary investigation into the conditions that resulted in the incident. This analysis included in-house, independent geological and engineering analysis and investigation. The ERCB analysis also included an extensive review of material submitted by the company to the ERCB, which consisted of detailed geology, engineering, seismic imaging, extensive monitoring, and modeling results. All information associated with the ERCB investigation has been released on the ERCB website (ERCB Bulletin 2010-10, February, 2010: <http://www.ercb.ca/docs/documents/bulletins/Bulletin-2010-10.pdf>).

In the ERCB staff opinion, geologic considerations related to the incident include: karstification of the underlying Paleozoic bedrock; faulting of both reservoir and caprock related to salt-dissolution tectonics and glacial thrusting; occurrence of sandy and silty mudstone horizons in what had previously been mapped as caprock shales; and removal of caprock by Quaternary erosion. Given ongoing caprock integrity concerns associated with fracturing and hydro-fracing in the subsurface to initiate production, these findings will have relevance to other shallow thermal and non-thermal operations, including in-situ bitumen/extra-heavy oil operations, and production of other emerging unconventional commodities such as tight oil and shale gas.