

SFD® Case Example: Stromatoporoid Patch Reef, Alberta, Canada

The Upper Devonian aged Normandville patch reef consists of fractured and partially dolomitized stromatoporoids from which oil and gas is produced. It is about 10 m thick, 1 km wide and 1.5 km long surrounded by impermeable limestone.

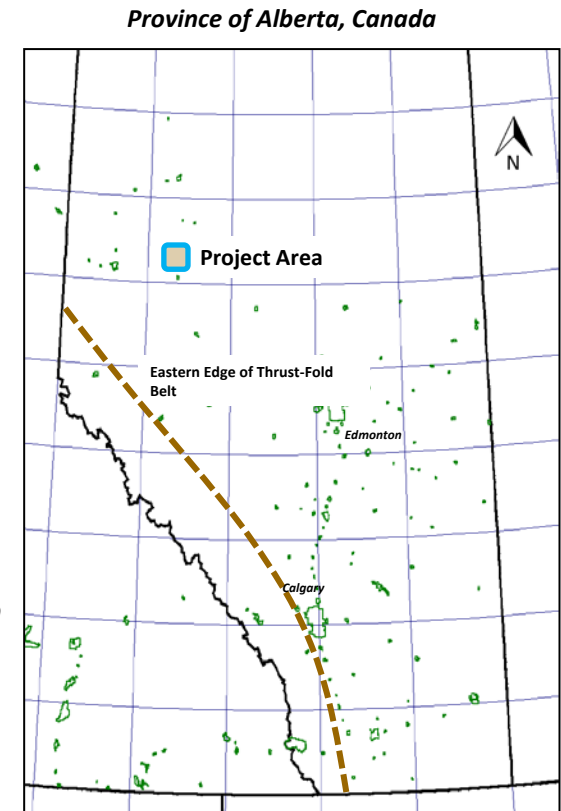
NXT has conducted various Research and Development surveys in the area to quantify the response of the SFD® survey system. These fields were used as templates for surveys conducted in similar geological settings.

References:

Halbertsma, H. L. *Alberta Energy Regulator – Chapter 13: Devonian Wabamun Group of the Western Canada Sedimentary Basin*

Prodruski, J.A., Barclay, J.E., Hamblin, A.P., Lee, P.J., Osadetz, K. G. Procter, R.M. and Taylor, G.C.; *Geological Survey of Canada: Conventional Oil Resources of Western Canada (Light and Medium) Part I: Resource Endowment. 1988. Paper 87-26*

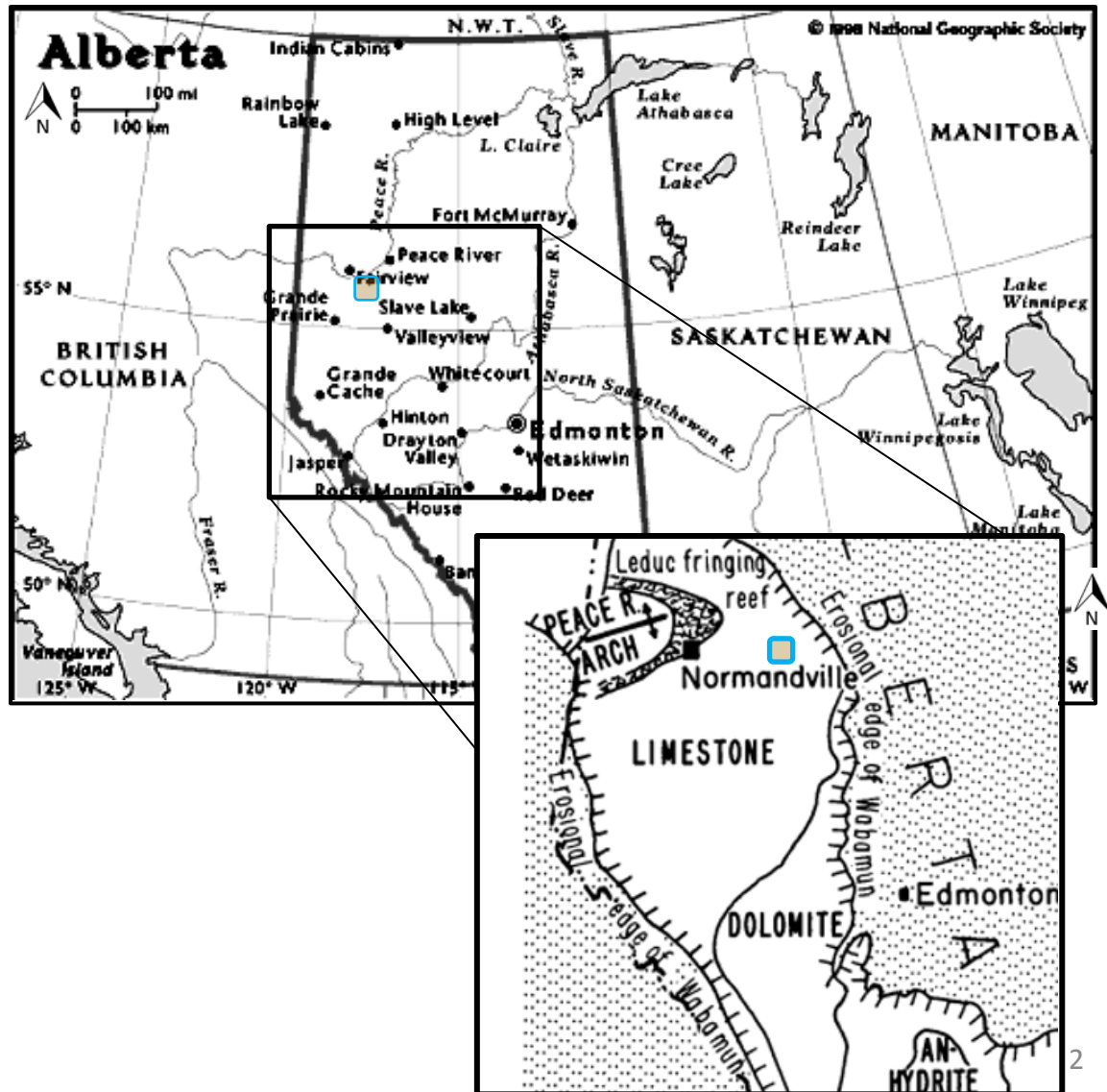
Stearn, Colin W., Halim-Dihardja, Marjammada K. and Nishida, Debra K. 1987; *The Society of Economic Paleontologists and Minerals: An Oil-Producing Stromatoporoid Patch Reef in the Famennian (Devonian) Wabamun Formation, Normandville Field, Alberta. 0883-1351/87/0002 P560-570*



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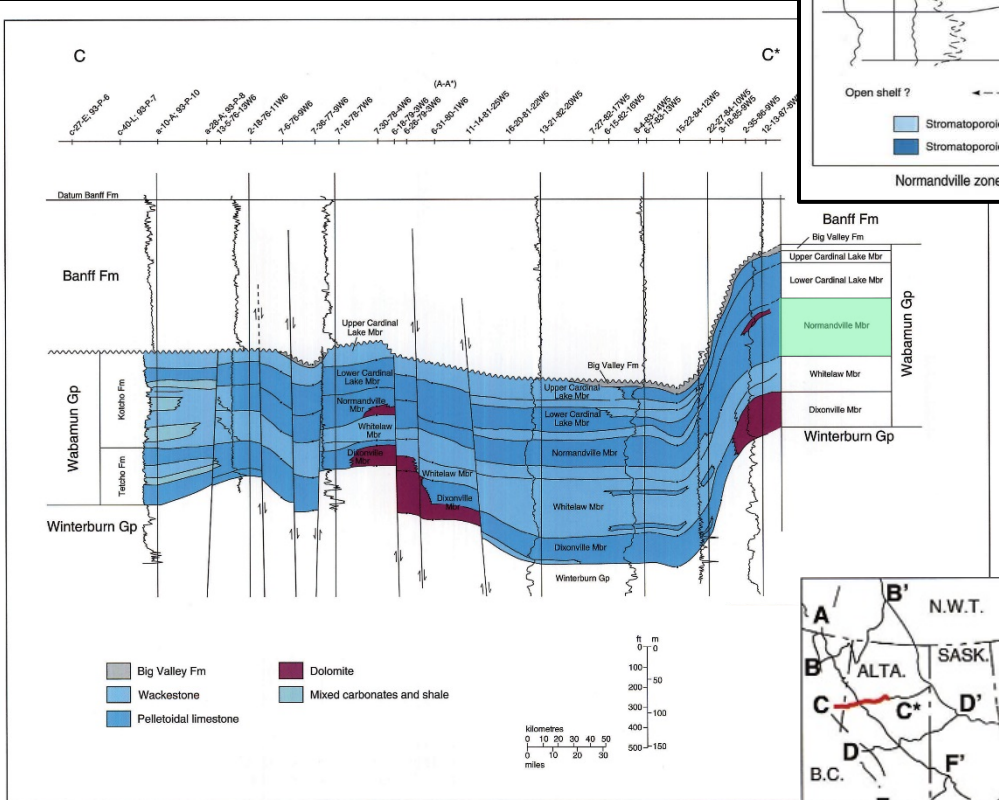
SFD® Case Example - Western Canada Upper Devonian Patch Reef – Normandville

- The map shows the location of the Normandville field in respect to the Peace River Arch and Leduc Fringing Reef.
- Oil is trapped within the stromatoporoid patch reef and reef margins. The producing interval is found 70 m below the base of the Wabamun Group and 130 m from the top. It formed on top of tabular stromatoporoids creating a local high after differential compaction and/or faulting from the underlying Frasnian Leduc reef.
- There are more than 500,000 wells drilled in Alberta province alone. This extremely rich geological information provides a very clear model of the subsurface to test the SFD® technology.

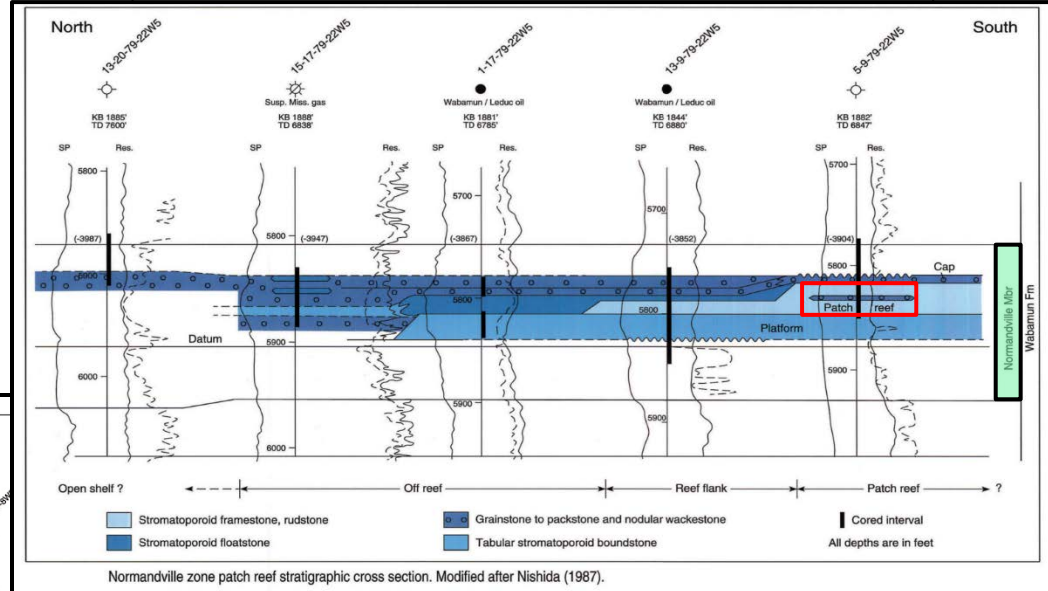


SFD® Case Example - Western Canada
Upper Devonian Patch Reef – Normandville

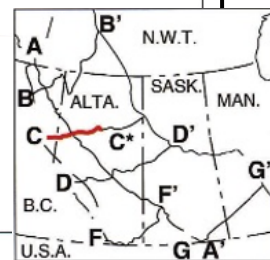
Regional Cross Section of the Wabamun Group with Normandville Member



Wabamun Carbonates Cross Section with Normandville Patch Reef



- The Normandville patch reef, located within the Normandville member, consists of fractured, partially dolomitized limestone that formed on a paleotopographic high over a Leduc reef.
- The upper, lower and lateral seals consist of impermeable Wabamun shelf limestone.
- Post-Wabamun faulting is present which has provided an additional structural component to the trap.



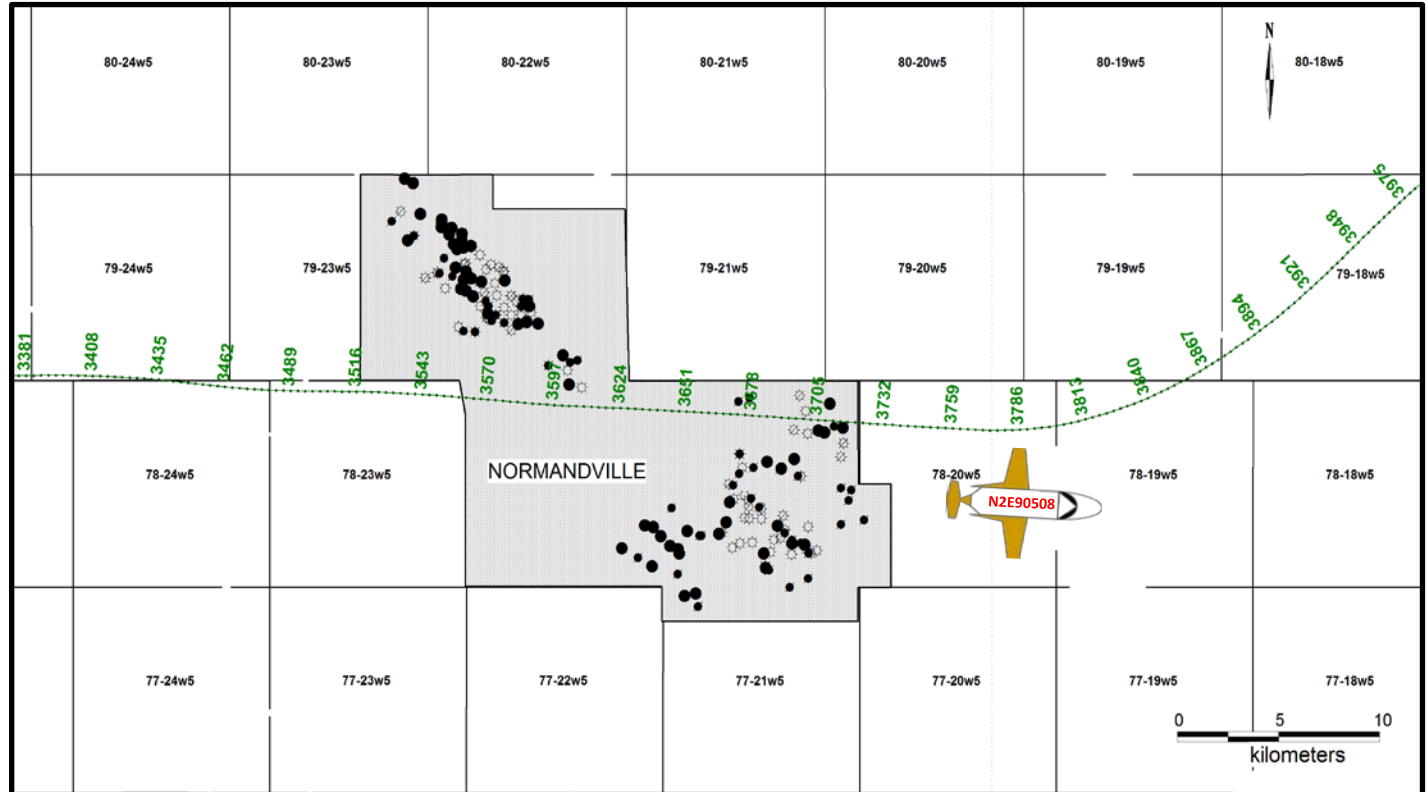
(Prodruski et al. 1988)

*SFD® Case Example - Western Canada
Upper Devonian Patch Reef – Normandville*

Normandville Field – North Western Alberta

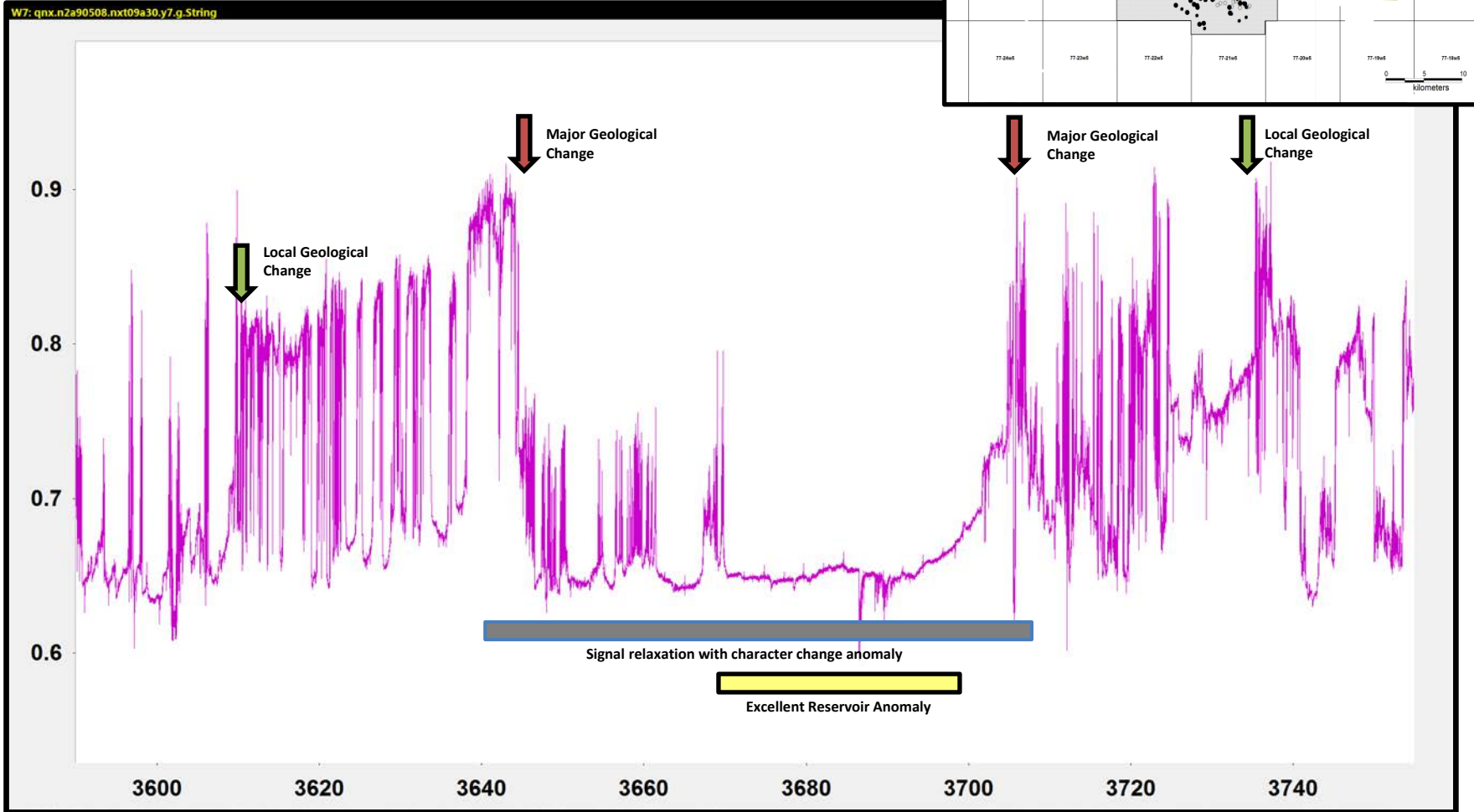
North Western Alberta

- SFD® flight 90508 was acquired in North Western Alberta over the Normandville patch reef system.
- The Normandville field was picked to evaluate the SFD® signal responses.
- Surface Area: 1.5 km²
- Wabamun Pool A+B In-Place Volume: 8.43 MMbbl
- Net Pay 10 meters
- Oil API : up to 10 degrees



SFD® Case Example - Western Canada
Upper Devonian Patch Reef – Normandville

SFD® 90508 Normandville Patch Reef



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Normandville Field – North Western Alberta

Summary

- SFD® flight 90508 detected an excellent reservoir anomaly over the Normandville field.
- SFD® showed an anomalous region starting with a local geological change at 3610 and finishing with a local geological change at 3725.
- Within the anomalous region the signal attributes are used to further delineate the core reservoir anomaly between 3670 and 3700.

