

AppleCore Legend









LITHOLOGY

	SAND/SANDSTONE		SHALEMUDSTONE		organic shale		LIMESTONE
	silty sand		silty shale		coal		Calcareous shale
	shaly sand		sandy shale		breccia		Lost Core
	sandy silt		clay/claystone				

CONTACTS

	Sharp		Erosional
---	-------	---	-----------


PHYSICAL STRUCTURES

	Current Ripples		Trough Cross-strat.		Oscillatory Ripples		Planar Tabular Bedding
	High Angle Tabular Bedding		Low Angle Tabular Bedding		Wavy Parallel Bedding		Synaeresis Cracks

LITHOLOGIC ACCESSORIES

	Silt Lamina		Shale Lamina		Pebbles/Granules		Glauconitic
	Feldspathic		Lithic		Rip Up Clasts		Coal Fragments
	Wood Fragments		Salt & Pepper				

ICHTHOFOSSILS

	Rootlets		Skolithos		Planolites		Gyrolithes
	Diplocraterion		Arenicolites		Escape Trace		Cylindrichnus
	Bergaueria		Astrosoma		Thalassinoides		Chondrites
	Teichichnus		Anconichnus				

Pick	Type of Surface	Description	Quality Code**
T21	Transgressive	Wabiskaw Marker Top Wabiskaw Mbr. 'A'	Good - Very Good
T15	Transgressive	Top Wabiskaw Mbr. 'B'	Good - Very Good
E14	Major Erosion	Wabiskaw Internal Incision	Good - Very Good
T11	Transgressive	Base First Regional Marine Shale in the Clearwater Fm. Top Wabiskaw Mbr. 'C'	Very Good-Excellent
T10.5	Transgressive	Top Wabiskaw Mbr. 'D' Incised Valley-Fill Deposit	Excellent-Very Good
E10	Disconformity/ Unconformity	Top Upper McMurray Fm Major Erosion Surface	Excellent –Very Good
E5	Disconformity/ Unconformity	Top Lower McMurray Fm. Major Erosion Surface	Variable Very Poor -Fair
Sub-Cret. (Pal.)	Unconformity	Base of McMurray Fm Major Erosion Surface	Variable Very Good-Excellent (However this is sometimes difficult to pick in areas of significant clastic karst-infill, or where marl is above the sub- Cretaceous unconformity)

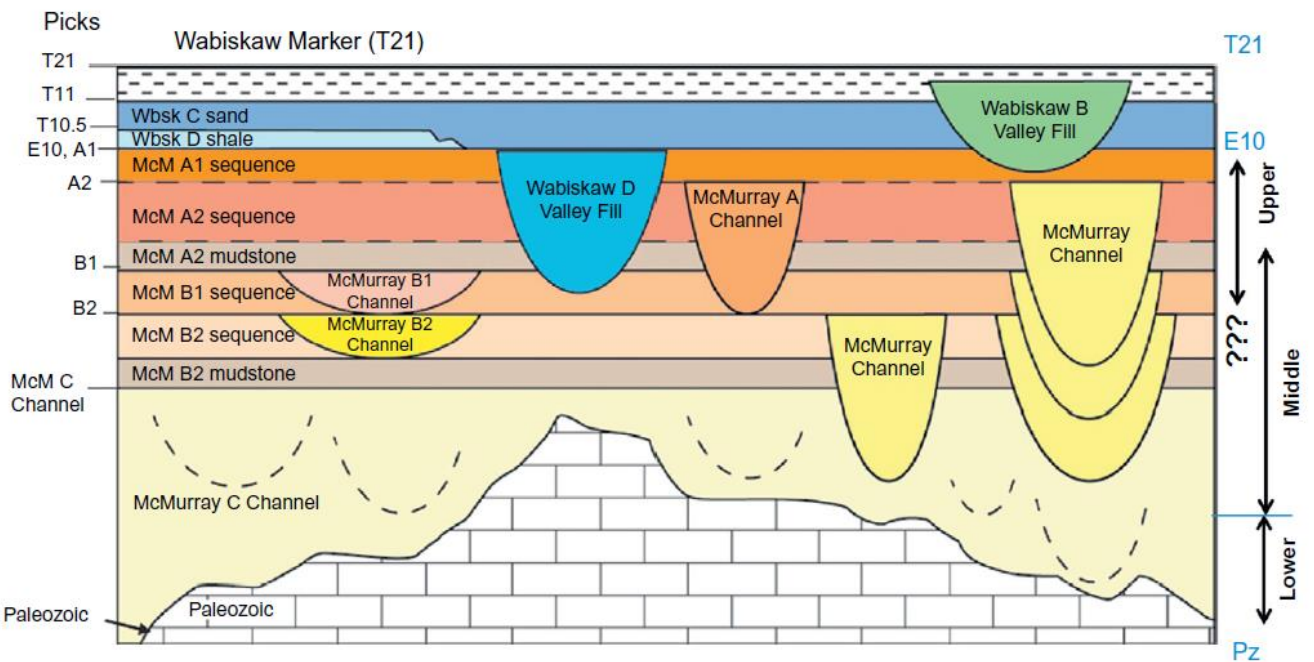
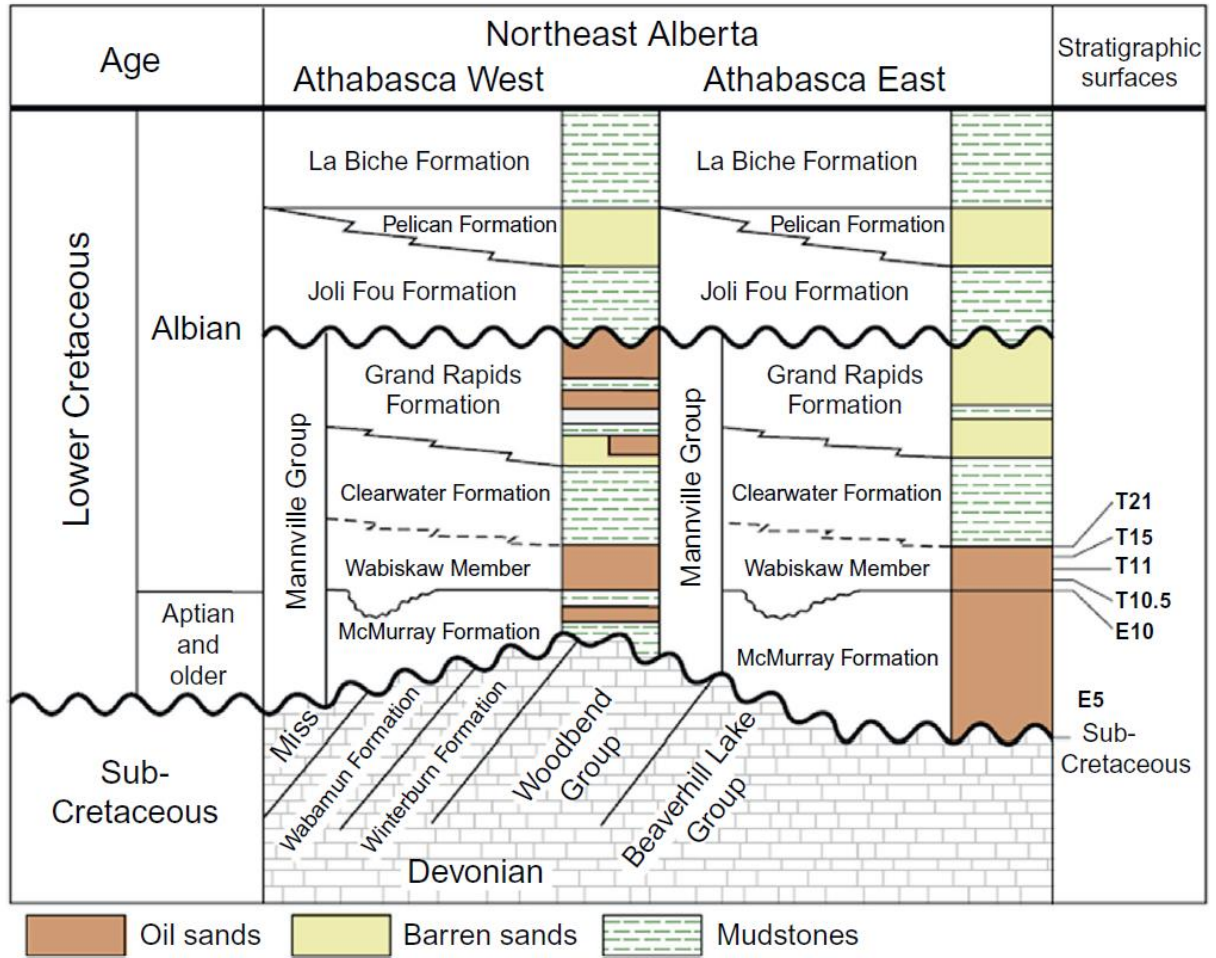
* Abbreviations: Group, Grp.; Formation, Fm.; Member, Mbr.

** Quality Codes are relative: Excellent to Very Good, can be picked on all wire-line logs and seismic; Poor to Very Poor, need to be confirmed by outcrops or core, difficult to pick on wire-line logs, somewhat easier to pick on seismic.

References

- Hein, F. J. Cotterill, D. K., and Berhane, H., 2000, An atlas of lithofacies of the McMurray Formation, Athabasca oil sands deposit, northeastern Alberta: Surface and Subsurface: Alberta Energy and Utilities Board/Alberta Geological Survey, Alberta Geological Survey, Edmonton, AB, Earth Sciences Report 2000-07, 216 p.
- Wynne, D. A., Attalla, M., Berhane, H., Brulotte, M., Cotterill, D. K., Strobl, R., and Wightman, D. M., 1994, Athabasca oil sands database: McMurray/Wabiskaw deposit, Alberta Energy and Utilities Board, Alberta Geological Survey, Edmonton, AB, Open File Report, 1994-14, 44 p.

Stratigraphic Nomenclature for Picks



References Posted on Alberta Energy Regulator and Alberta Geological Survey websites

- Alberta Energy and Utilities Board (2003): Athabasca Wabiskaw-McMurray Regional Geological Study, Alberta Energy and Utilities Board Report, 187 p., URL < <https://www.aer.ca/documents/reports/r2003-a.pdf>. > [January 2017].
- Hein, F. J. (2000): Historical overview of the Fort McMurray area and oil sands industry in northeast Alberta (with expanded bibliographies on oil sands, surficial geology, hydrogeology, minerals and bedrock in northeast Alberta); Alberta Energy and Utilities Board, Alberta Geological Survey, Earth Sciences Report 2000-05, 26 p with appendices, URL < http://www.ags.gov.ab.ca/publications/ESR_2000_05.html > [May 2017]
- Hein, F. J., Berhane, H., and Weiss, J. A. (2007): Cold Lake oil sands area: Formation picks and correlation of associated stratigraphy; Alberta Energy and Utilities Board, Alberta Geological Survey, Geo-Note 2006-03, 17 p., URL < http://www.ags.gov.ab.ca/publications/GEO_2006_03.html > [May 2017]
- Hein, F.J. and Cotterill, D.K. (2007): Field guide: Regional sedimentology and processes of deposition of the Athabasca oil sands, northeast Alberta; Alberta Energy and Utilities Board/Alberta Geological Survey, Geo-Note 2006-04, 157 p., URL < http://www.ags.gov.ab.ca/publications/GEO_2006_04.html > [May 2017]
- Hein, F.J., Cotterill, D.K., and Berhane, H. (2000): An atlas of lithofacies of the McMurray Formation, Athabasca oil sands deposit, northeastern Alberta: Surface and subsurface; Alberta Energy and Utilities Board, Alberta Geological Survey, Earth Sciences Report 2000-07, 216 p., URL < http://www.ags.gov.ab.ca/publications/ESR_2000_07.html > [May 2017]
- Hein, F.J., Cotterill, D.K., and Rice, R. (2006a): Subsurface geology of the Athabasca Wabiskaw-McMurray succession: Lewis – Fort McMurray area, northeastern Alberta (NTS 74D/14); Alberta Energy and Utilities Board/Alberta Geological Survey, Earth Sciences Report 2006-06, 67 p., URL < http://www.ags.gov.ab.ca/publications/ESR_2006_06.html > [May 2017].
- Hein, F.J., Cotterill, D.K., Weiss, J., and Berhane, H. (2006b): Subsurface geology and facies characterization of the Athabasca Wabiskaw-McMurray succession Firebag-Sunrise area, northeastern Alberta (NTS 74D/74E); Alberta Energy and Utilities Board/Alberta Geological Survey, Earth Sciences Report 2006-08, 73 p., URL < http://www.ags.gov.ab.ca/publications/ESR_2006_08.html > [May 2017].
- Hein, F. J. and Dolby, G. (2017): Palynology, lithostratigraphy, and biostratigraphy of the Athabasca oil-sands deposit, northeastern Alberta; Alberta Energy Regulator, Alberta Geological Survey, Open File Report (2017, under review), 56 p. with digital appendices.
- Hein, F.J., Langenberg, C.W., Kidston, C., Cotterill, D.K., Berhane, H., and Berezniuk T. (2001): Comprehensive field guide for facies characterization of the Athabasca oil sands, Fort

McMurray area, northeast Alberta; Energy and Utilities Board, EUB/AGS Special Report 13, 335 p., URL <
http://www.ags.gov.ab.ca/publications/SPE_013.html > [May 2017]

Langenberg, C. W., Hein, F. J., and Berhane, H. (2001): Three-dimensional geometry of fluvial-estuarine oil sand deposits of the Clarke Creek area (NTS 74D), northeastern Alberta; Energy and Utilities Board, EUB/AGS Earth Sciences Report 2001-06, 35 p., URL <
http://ags.aer.ca/publications/ESR_2001_06.html > [May 2017]

Wynne, D. A., Attalla, M., Berhane, H., Brulotte, M., Cotterill, D. K., Strobl, R., and Wightman, D. M. (1994): Athabasca oil sands database: McMurray/Wabiskaw deposit; Alberta Energy and Utilities Board, Alberta Geological Survey, Open File Report, 1994-14, 44 pp., URL <
http://www.ags.gov.ab.ca/publications/OFR_1994_14.html > [May 2017]