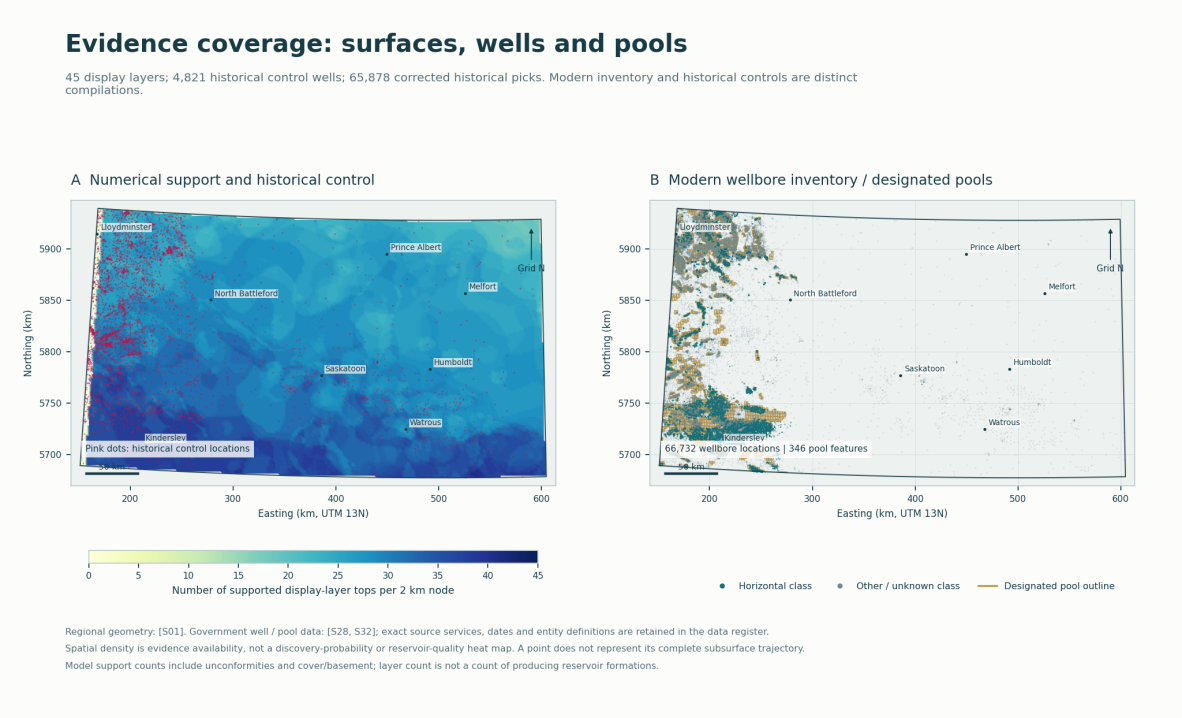
WESTERN CANADA SEDIMENTARY BASIN / SASKATCHEWAN

West-central & central Saskatchewan

Geology, paleoenvironments and hydrocarbon potential

110°W-103.5°W and 51.25°N-53.5°N, Saskatchewan side of the Alberta border. West-central index window: 110°W-106°W; central index window: 106°W-103.5°W. The 106°W division is for navigation, not a geological boundary. The catalogue covers Precambrian through Quaternary, including unsupported or externally analogous formations explicitly marked as documentary.

Model layers	Mapped pool features	Well inventory records
45	346	66,732



Supported display-layer tops, separately published historical picks, modern wellbore locations and designated pool polygons. Historical controls and modern inventory are not assumed to represent identical wells or a single date. Surface support is not reservoir quality. Sources and snapshot counts are retained in the data register. [S01, S28, S32].

Prepared 28 October 2026. An independent public-evidence synthesis. Candidate settings are hypotheses requiring local correlation, reservoir, seal, charge and preservation tests.

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Regional findings and how to use this study

One continuous regional model supports two viewing windows. The study separates documented Viking, Mannville and western Bakken petroleum systems from conditional extensions and central Saskatchewan geological possibilities. Formation edges, thickness, wells, core availability and pool designation are evidence layers with different meanings.

Priority geological questions

- Three distinct western petroleum-system families deserve detailed follow-up: Viking shelf/delta/reworked sand, multilevel Mannville coastal and valley-fill reservoirs, and conventional sandstone-rich western Bakken. They cannot be represented by one continuous shoreline belt.
- Winter Dina-Cummings, Sparky-Waseca and Paradise Hill Colony demonstrate separate depositional and erosional architectures. A broad Cantuar/Pense model cannot resolve these named members or place their oil pools at a measured member depth.
- Western Bakken tidal/marginal-marine sandstone and sub-Cantuar preservation differ from the southeast Saskatchewan tight-oil analogue. The official inventory contains multiple western Bakken pools; it is not just an inferred formation edge.
- Central Spinney Hill and Viking sand occurrences are supported by published core work. The Fort-à-la-Corne/Melfort upper package also contains hiatuses and condensation. These are geological observations, not proof of a new oil fairway.
- Central carbonate banks, dolomitized beds and salt-dissolution structures are possible reservoir or trap components. The principal unresolved petroleum questions are charge, connected pores, retained seal, timing and preservation.
- A mapped zero edge can reflect erosion, onlap or other disappearance. It is not automatically a depositional pinchout. Analyst-selected thin-interval contours and model-support limits are displayed separately.
- Every numerical thickness is a gross vertical interval between named supported surfaces. It is not net sand, true stratigraphic thickness, net pay or an estimate of recoverable hydrocarbons.

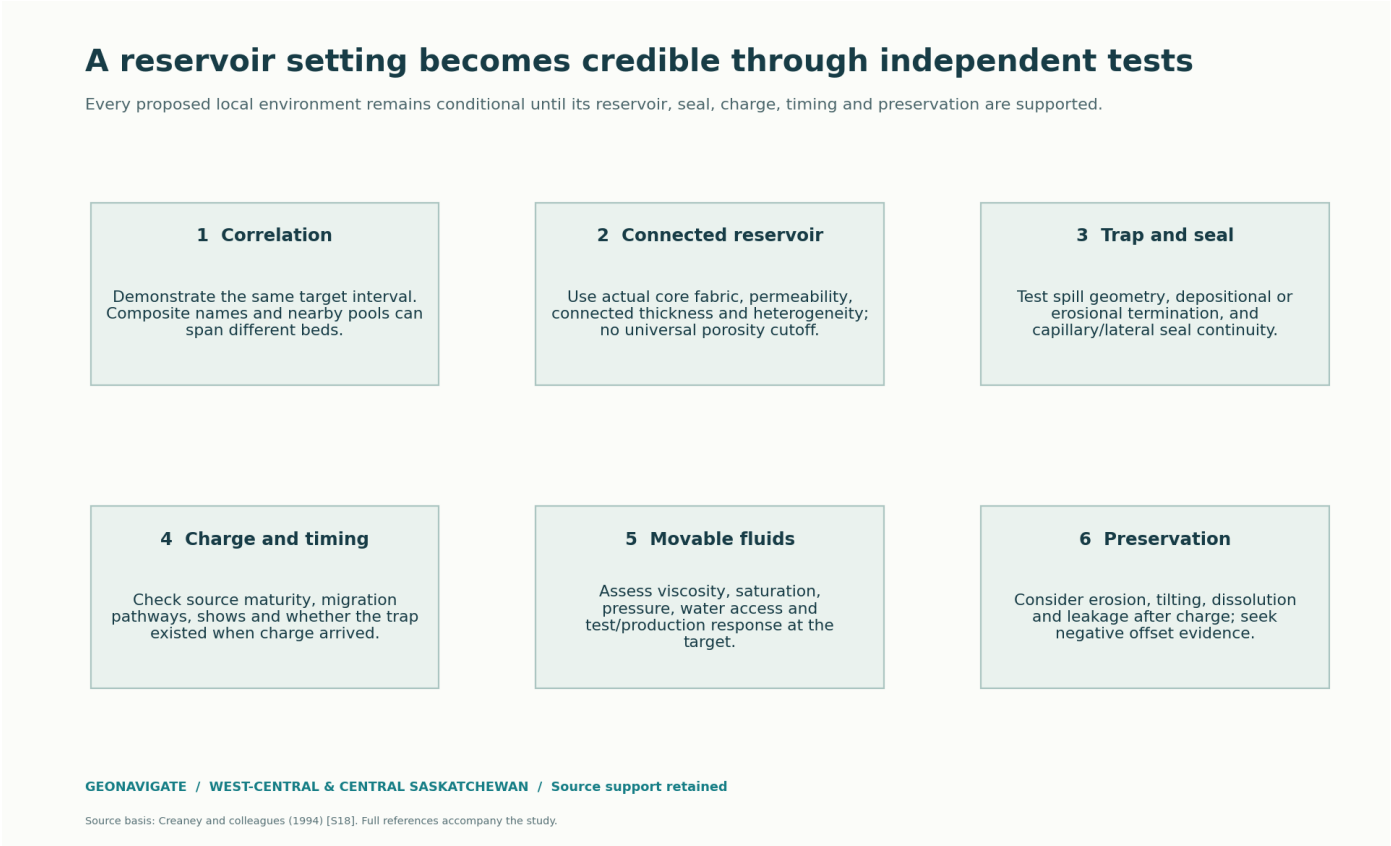


Figure 1. A falsifiable assessment sequence, not a numerical chance-of-success or reserves model. A porosity, thickness or structural anomaly alone does not satisfy the other petroleum-system conditions. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S18.

Scope, sources and evidence limits

110°W-103.5°W and 51.25°N-53.5°N, Saskatchewan side of the Alberta border. West-central index window: 110°W-106°W; central index window: 106°W-103.5°W. The 106°W division is for navigation, not a geological boundary. The catalogue covers Precambrian through Quaternary, including unsupported or externally analogous formations explicitly marked as documentary.

Evidence	Included	Interpretive limit
Regional surfaces	45 display layers on a 2 km grid	Original published source triangles resampled where supported; no inferred surface across unsupported cells.
Historical tops	4,821 in-window control wells; 65,878 corrected picks	The historical control compilation and the modern well inventory have different dates, purposes and identifiers.
Source-model markers	49,377 markers	XYZ marker count is not well count. A marker without a bore identifier is not forcibly joined to an inventory well.
Current well inventory	66,732 processed wellbore records	Published plan traces, measured depth, vertical depth, KB elevation, completion and TD-formation evidence retain their individual source basis.
Designated pools	346 source features	Pool outlines are administrative/geological source polygons, not fluid contacts or exact producing-body boundaries.
Samples and logs	Public catalogue links and documented studies where available	Catalogue presence is availability evidence. It is not a claim that every core, cutting sample or wireline log has been examined.
Production / resource potential	Source-dated examples and conditional reservoir settings	No new remaining-reserves estimate, discovery probability or lease-scale prospective polygon is assigned.

Evidence policy

Source-described measurements and published interpretations are cited. Adjacent-area hypotheses are conditional and not prospect polygons, reserves, remaining oil estimates, drilling recommendations or claims of available land. Core/cuttings catalogue records establish availability only. Published core/log examples are not new physical-core logging or a full well-log reinterpretation by this project.

Well depths and trajectories

Record class	Count / basis
Drilled / in progress	60,003; a drilling status does not establish completed TD
Horizontal classification	22,793; source classification, not a complete 3D survey
Published plan traces	26,598; two-dimensional until tied to depth-indexed survey stations
Reported measured depth	63,703 records; source depth-reference basis retained
Reported vertical depth	63,700 records; kept distinct from measured depth
KB elevation match	4,796; other displays retain an explicit relative-depth basis
Historical TD-formation match	33,943; conservative source reconciliation, not a new log interpretation
Sample-catalogue match	14,020; availability does not imply sample examination

Inventory definitions

Aggregate completion associations by exact WELLBORE_CWI; preserve Boss, Leg and Whipstock bore IDs and all source OBJECTIDs. Full raw source attributes retained separately.

Formation at TD

Historical BOTTOM_FM is used as TD formation only where normalized bore UWI matches uniquely and legacy total depth and current reported MD differ by no more than 5m; it remains a historical source interpretation, not a new log pick. Completion formations are separate attributes.

Pool placement evidence

Placement class	Count	Meaning
Has supported surface geometry	66	At least part of the polygon has a defensible model reference surface; a regional top is not the exact producing bed.
No surface geometry	280	Displayed on an explicit reference plane because reservoir geometry is unresolved or outside accepted support.
Has reference-plane fallback	306	Includes fully unresolved pools and partially mapped pools; this count overlaps the other classes.
Both surface and reference fallback	26	Unsupported parts or unresolved commingled intervals retain the reference-plane distinction.

Reported TD, measured depth, true vertical depth, source KB elevation, completion interval and formation at TD are different quantities. A vertical illustration requires a documented depth and an explicit assumption where no survey exists. Missing TD stays unknown; the deepest formation pick or deepest core interval is not automatically TD. Designated pool polygons illustrate a regional reference surface where a defensible interval match exists; they do not locate each producing bed or establish a shared pressure system.

Sample availability and regional extent

Evidence	Included in this release
Study footprint	110,817 square kilometres; one continuous window across two programme areas
Stratigraphic / contextual layers	35 stratigraphic units; 7 unconformity layers; the remaining display layers provide basement/cover context
Historical controls with context	5,313 controls including 492 available controls outside the study in the 20 km context envelope
Core catalogue	37,424 source rows; 4,133 distinct inventory bores matched
Cuttings catalogue	12,539 source rows; 11,883 distinct inventory bores matched
Pool designation types	Oil: 270; Gas: 60; Oil & Gas: 16

All inventory counts refer to this clipped release and source definitions. Counts do not measure interpretive completeness.

The complete acquisition and validation registers accompany the data ZIP. They preserve enumerated source identifiers, clipping results, source-field reconciliation and null-depth rules. This study reviews available primary publications and catalogue evidence; it does not claim a fresh physical examination of every listed sample or interpretation of every well log.

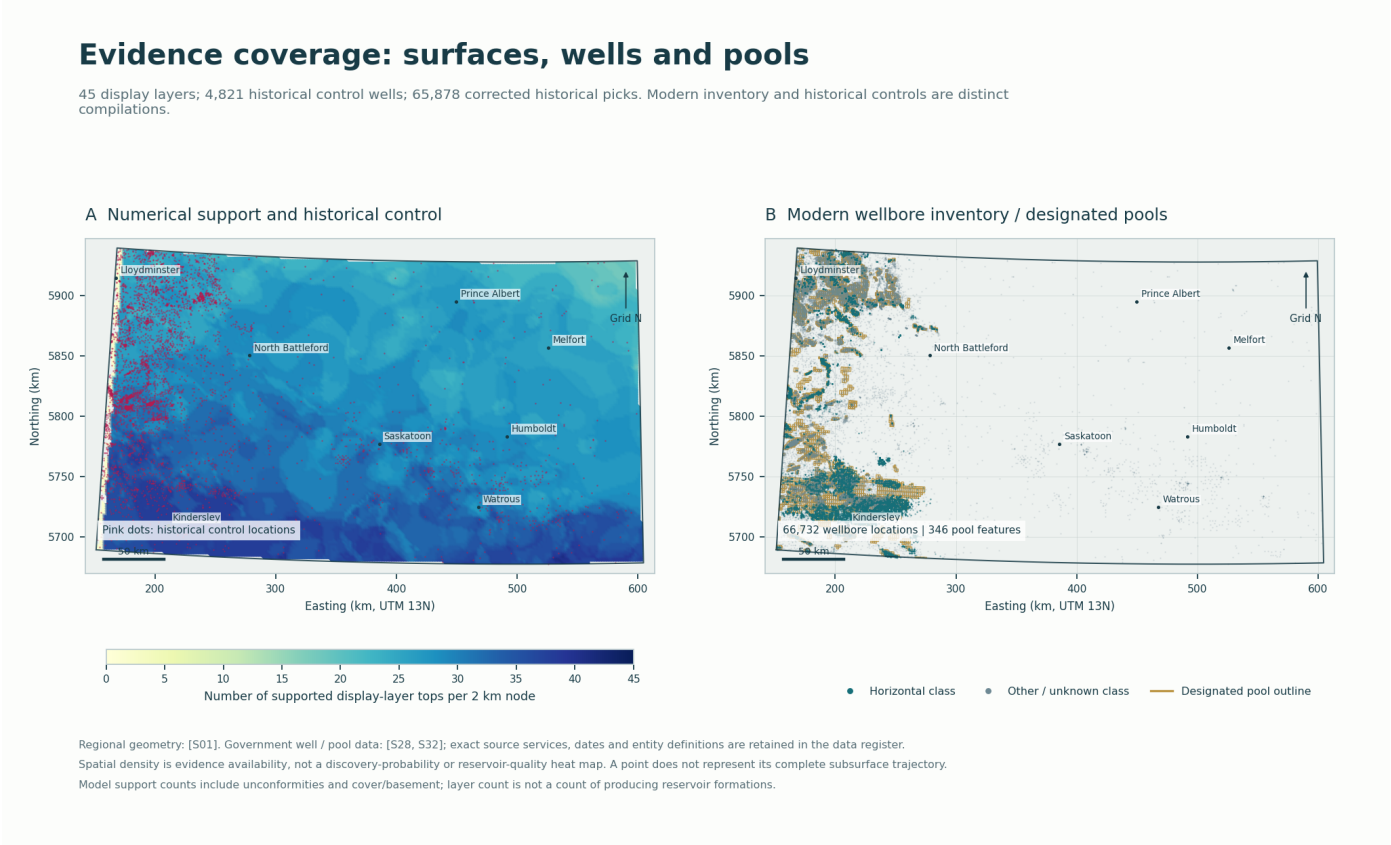


Figure 2. Supported display-layer tops, separately published historical picks, modern wellbore locations and designated pool polygons. Historical controls and modern inventory are not assumed to represent identical wells or a single date. Surface support is not reservoir quality. Sources and snapshot counts are retained in the data register. [S01, S28, S32].

Regional windows and source geometry

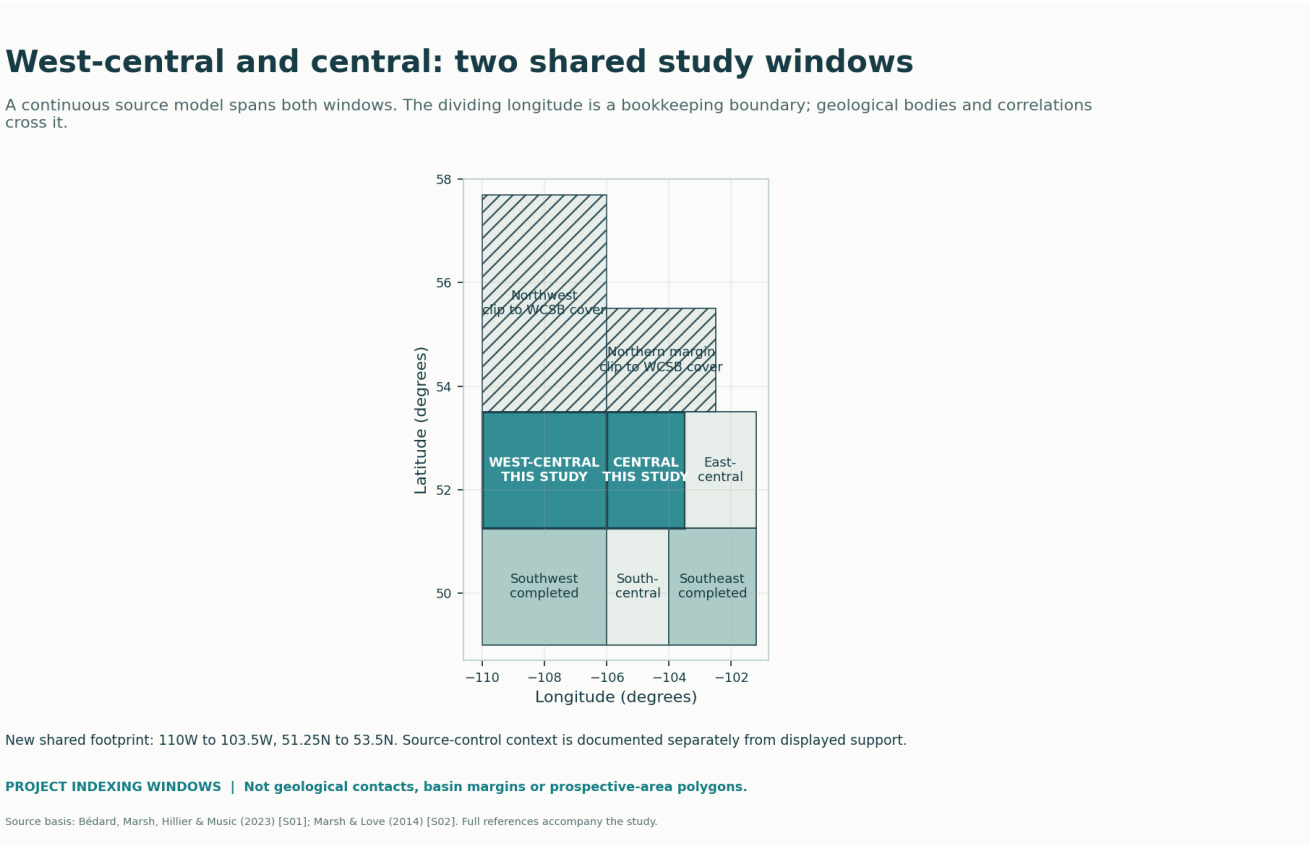


Figure 3. The two selected rectangles organize one continuous regional study. The Saskatchewan boundary and map windows do not define reservoir limits. Other northern rectangles require independent clipping to WCSB sedimentary cover. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S01, S02.

The west-central window is 110°W to 106°W and the central window is 106°W to 103.5°W, both from 51.25°N to 53.5°N. They are indexing windows used to organize the work. The model preserves the geographic study mask, uses a declared projected reference system, and treats neighbouring source control as context without expanding asserted surface support.

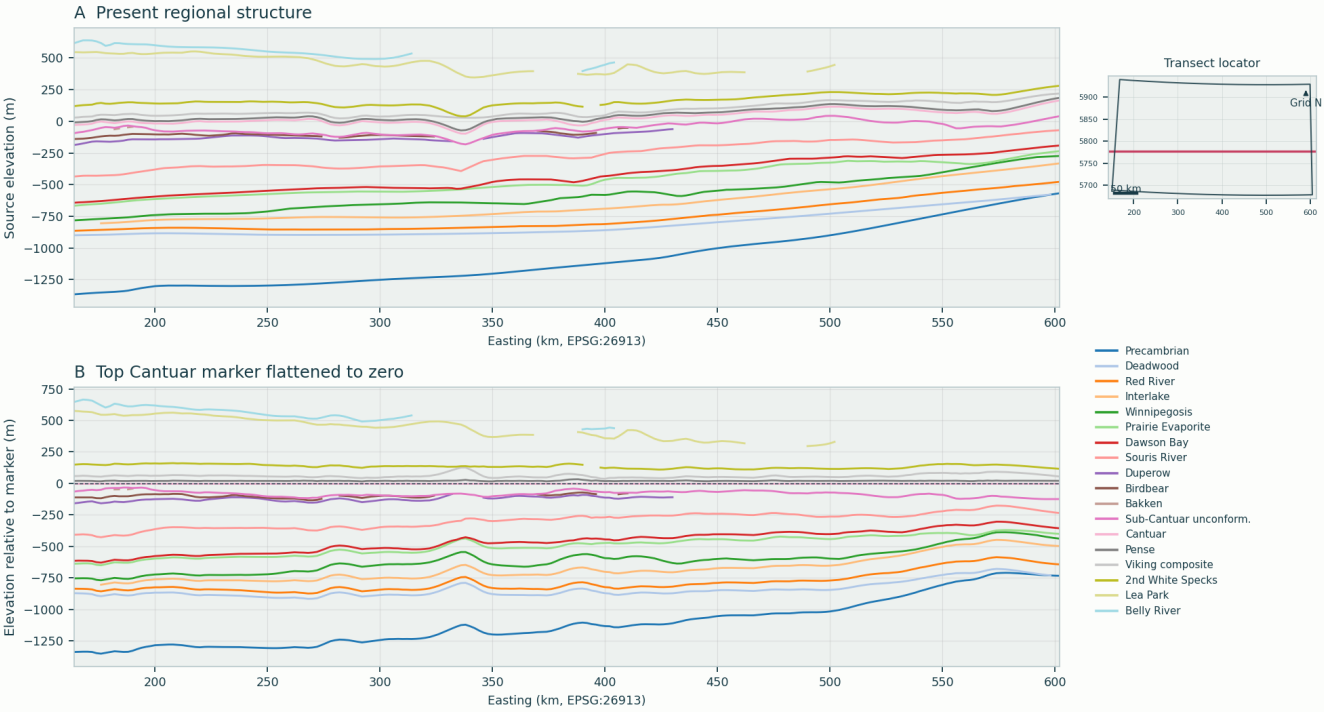


Figure 4. Projected west-east transect at northing 5778 km. Present elevations and same-marker flattening use identical supported grid nodes; gaps are retained. A flattened comparison is not a tectonic or depositional restoration. [S01].

The present-structure section retains source elevations. A marker-flattened comparison subtracts the same supported marker elevation from each horizon; it is a geometric comparison, not a full restoration of compaction, erosion, faulting, salt movement or paleowater depth.

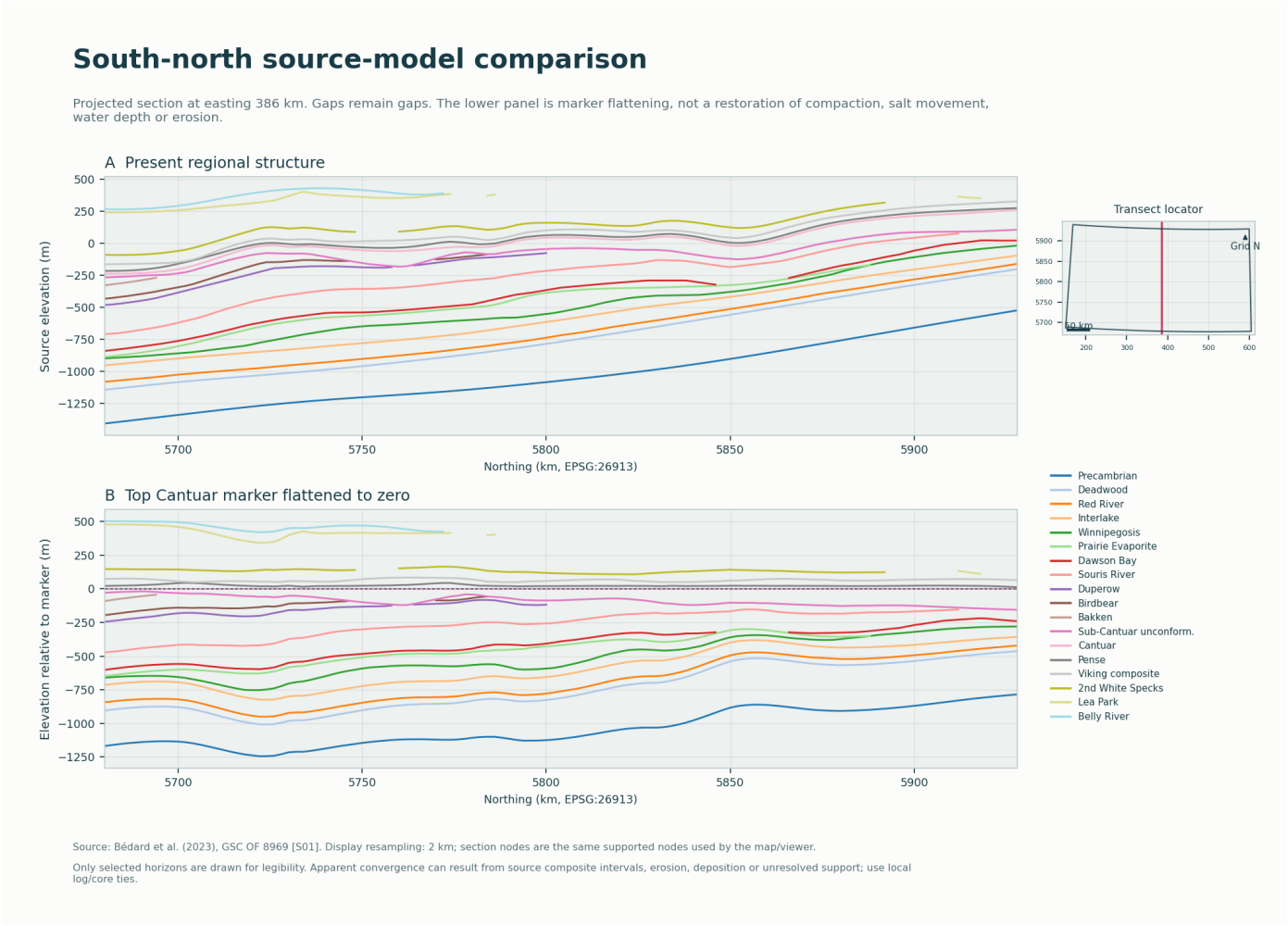


Figure 5. Projected south-north transect at easting 386 km. Present elevations and same-marker flattening use identical supported grid nodes; gaps are retained. A flattened comparison is not a tectonic or depositional restoration. [S01].

Formation edges, erosional surfaces and contours

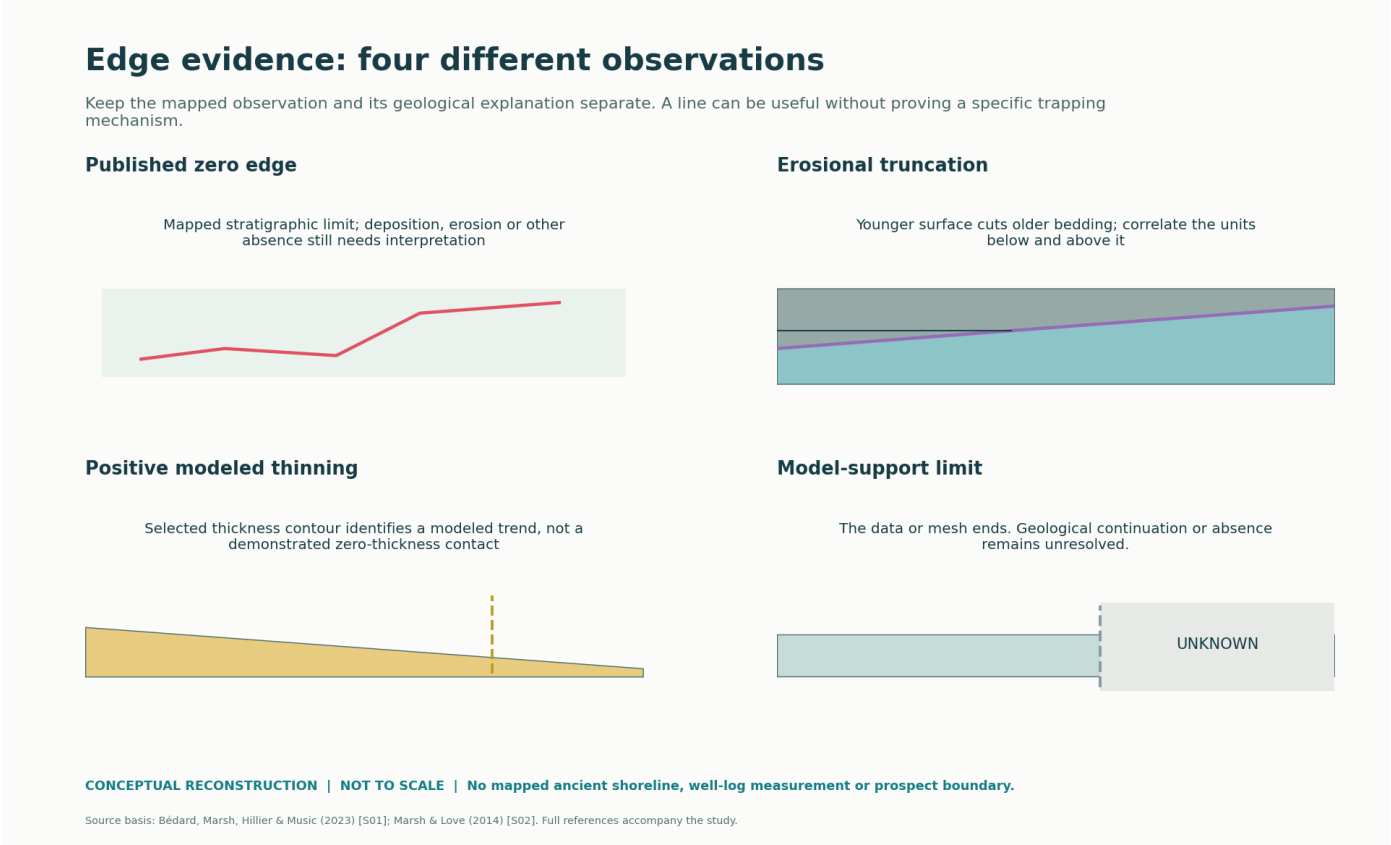


Figure 6. Illustrative evidence classes. Georeferenced versions retain source attributes and units; their elevations are attached only where defensible support exists. Diagram shapes are not traced from a regional oil pool or mapped formation edge. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S01, S02.

Evidence class	Meaning	Reservoir-screening use
Published zero edge	A source-mapped stratigraphic limit; its genetic origin can remain unspecified.	Test whether reservoir facies, top/lateral seal and charge persist toward the limit.
Erosional / unconformity evidence	A mapped or modeled bounding surface with source attribution.	Correlate truncated units, preserved remnants and overlying fill; distinguish present relief from reconstructed paleorelief.
Modeled thinning contour	A selected positive gross-thickness threshold on supported grid triangles.	Find thinning trends to investigate; the contour is not automatically a depositional pinch-out.
Model-support limit	A source mesh, data window or sampling boundary.	Identify where additional control is needed; no geological absence is inferred.
Modern bedrock contact	Present bedrock mapping context where supplied.	Use its own age and mapping basis; it does not directly trace a buried reservoir body.

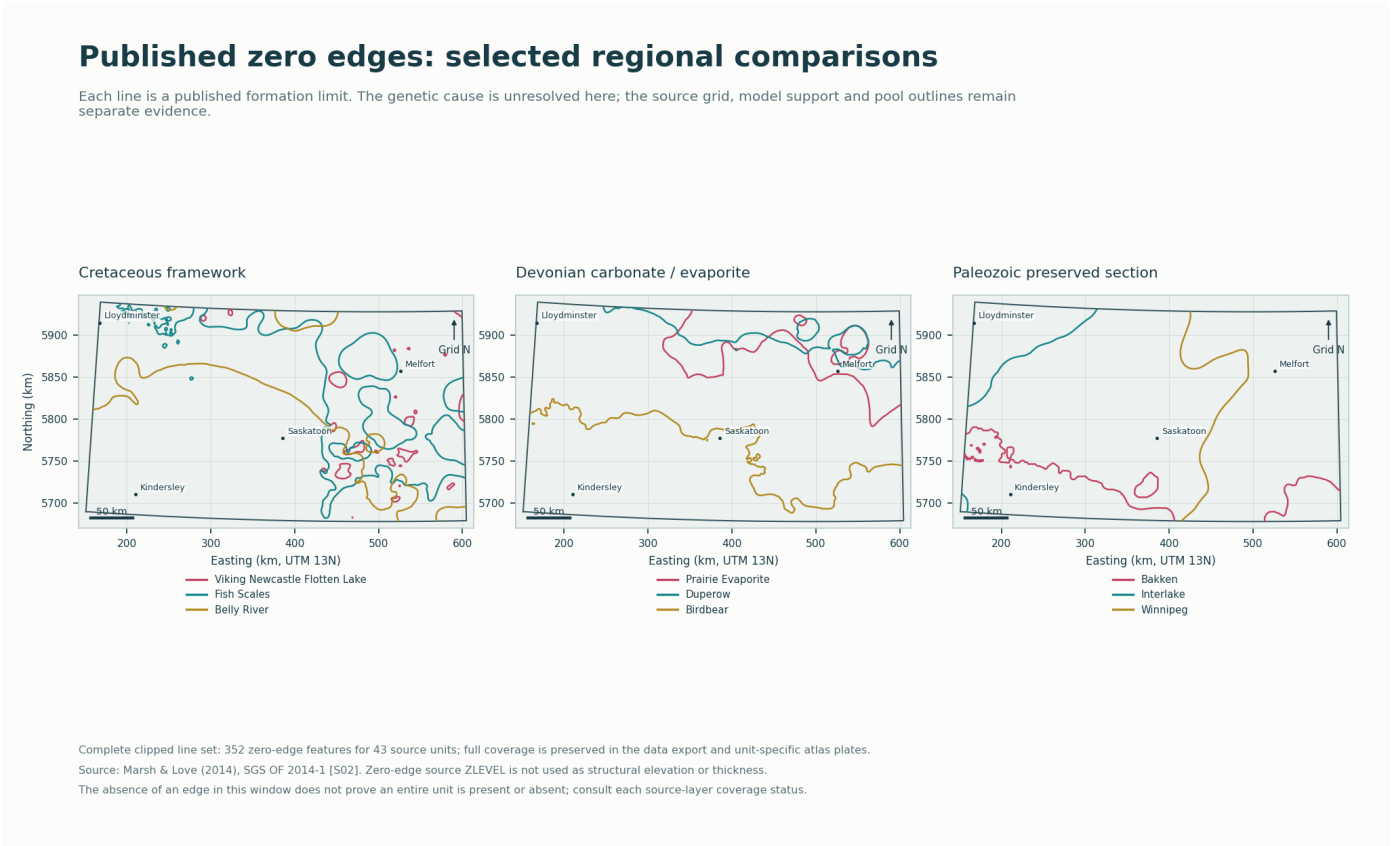


Figure 7. Selected primary-source geological limits, with all original clipped features retained in the downloadable GeoJSON. No new depositional pinch-out, trap closure or fluid contact is inferred. [S02].

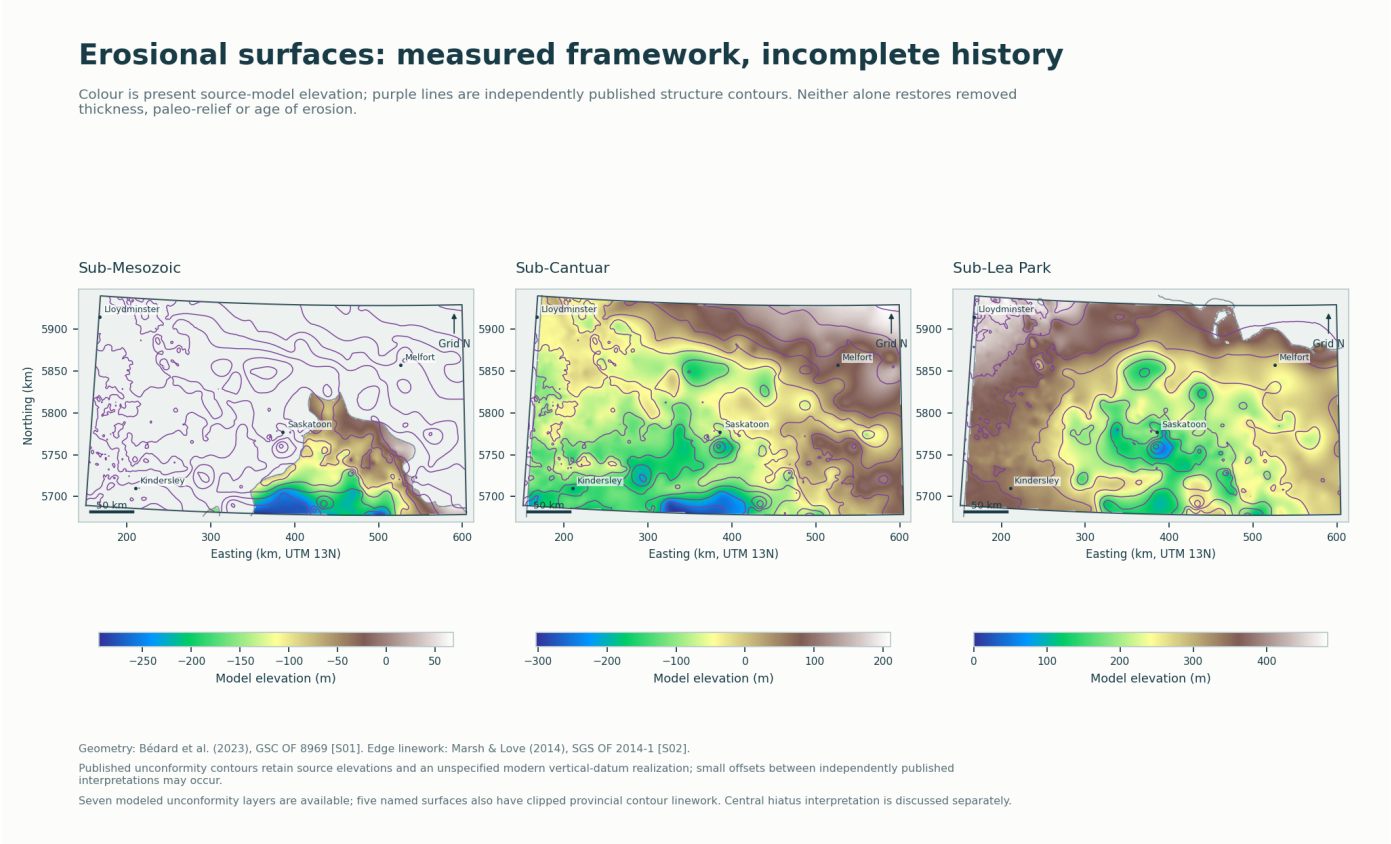


Figure 8. Source-model unconformity elevations compared with independently published contour traces. Geometric relief does not by itself identify depositional paleorelief, eroded thickness or a sealed trap. [S01, S02].

User-defined contours in 3D / VR

Regional navigation and layer presets

Use Whole, West-central or Central to change the camera view within the same continuous model. The Viking, Mannville and Central layer presets select different stratigraphic contexts; they do not change the underlying geology or its evidence. In the edge controls, switch off Follow visible units to see independently mapped zero edges whose source unit has no supported numerical horizon in the model.

- Select a formation, open Contours & edges, and enable Show contours. Choose top structure, a supported base, or gross thickness.
- Enter a positive contour interval and an optional origin, then select Apply contour settings or press Enter. Fractional intervals are accepted.
- Choose the active visible formation or all visible formations; labels, colours, vertical exaggeration and cutaways remain display choices.
- The same geometry enters the WebXR scene. Set an exact interval before entering VR; headset controls offer show/hide, quantity selection and half/double interval actions.
- A fine interval adds lines to an interpolated surface; it does not improve well spacing, source resolution or elevation accuracy. Unsupported triangles remain gaps.
- Export selected tops and current contour/edge lines as GLB or projected linework/evidence as JSON. Pool/well geometry, labels and a baked cutaway are outside the current-selection export. Full regional downloads are separate.

1. Regional framework: depositional basin, preservation and evidence

This window crosses a proven western Cretaceous oil province and a central platform where reservoir-like rocks do not by themselves demonstrate charge. Ancient shorelines shifted repeatedly. Present structural dip, a mapped zero edge and a pool boundary describe different things.

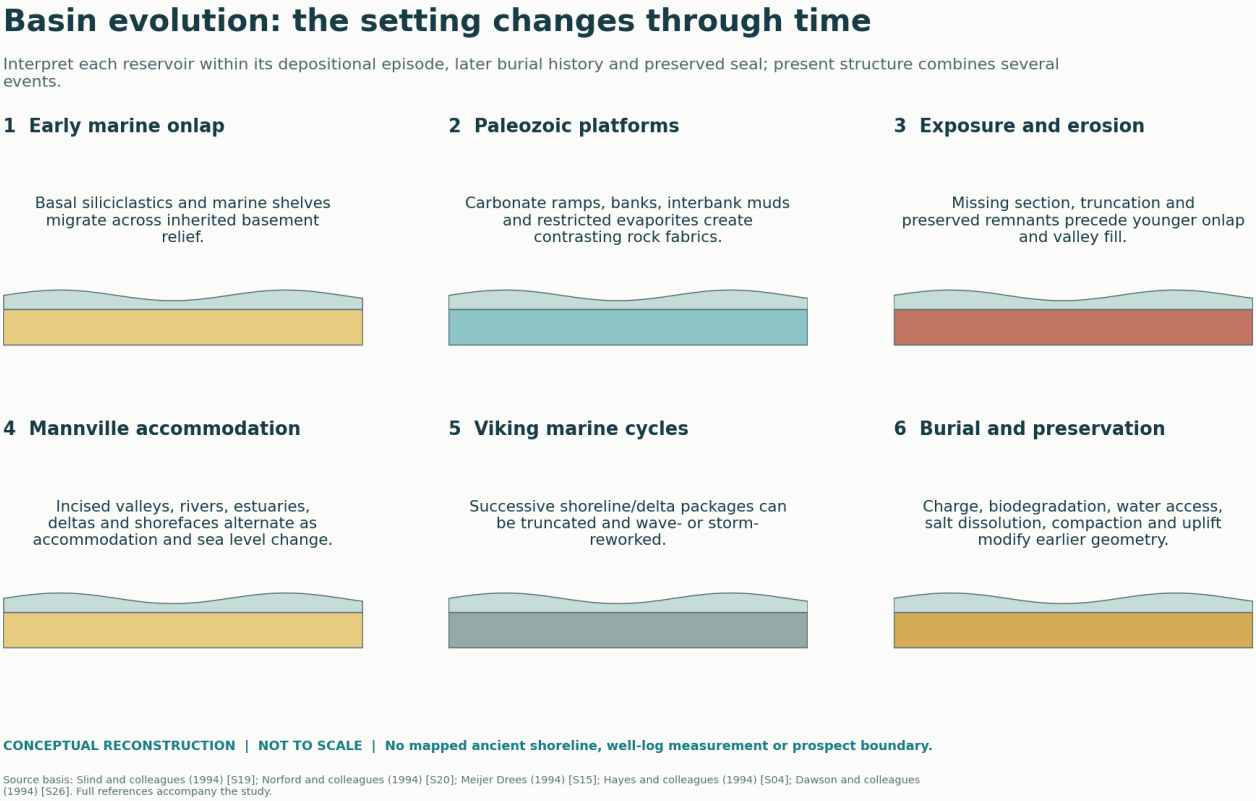


Figure 9. Conceptual event sequence. No fixed modern basin outline, local paleo-coastline or directional sediment-transport vector is projected into every geological period. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S19, S20, S15, S04, S26.

See Figure 6 - Published zero edges, erosion, thinning and model support (earlier in this study).

See Figure 1 - Evidence sequence for hydrocarbon screening (earlier in this study).

See Figure 3 - Shared west-central and central study windows (earlier in this study).

Precambrian basement and inherited relief

Precambrian | crystalline basement | framework

Crystalline crust beneath the sedimentary basin provided a substrate for later onlap. Buried relief may have influenced accommodation, but a basement high must be demonstrated independently of an overlying salt-collapse feature.

Numerical layers: Precambrian.

Published observations

- Regional basement geometry is supplied by the GSC model [S01].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Use basement geometry to test a structural hypothesis and sediment distribution; do not treat basement itself as a demonstrated oil reservoir.

Criteria for a producing reservoir

- Require seismic or stratigraphic evidence that movement affected the target interval, then test reservoir, seal, charge and timing separately.

Area significance

Whole window; deepest control is much sparser than shallow petroleum drilling.

Evidence that weakens the idea

- A high on a smoothed basement surface is not a mapped fault or closure at reservoir depth.

Sources: S01, S19. Full references follow.

Regional unconformities and formation zero edges

Multiple ages | surface framework | preservation / trap framework

The sub-Devonian, sub-Mesozoic, sub-Success, sub-Cantuar and sub-Quaternary surfaces record different episodes of missing section. A source zero edge records mapped disappearance, whereas a model support boundary records where interpolation was allowed.

Numerical layers: Top Lower Paleozoic unconformity, Sub-Mississippian unconformity, Sub-Mesozoic unconformity, Sub-Success unconformity, Sub-Cantuar unconformity, Sub-Quaternary unconformity.

Published observations

- Official mapping supplies zero-edge geometry; the GSC model includes independently identified unconformities [S01; S02].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test whether a porous bed terminates against a continuous sealing unit; alternatively evaluate a preserved remnant below an erosional cap.

Criteria for a producing reservoir

- Use adjacent wells with diagnostic tops, fossils and core contacts to choose erosion, onlap, lateral facies change or missing control. Require a physically plausible top and lateral seal.

Evidence that weakens the idea

- Thin-interval contours are screening thresholds, not geological zero edges. Erosion can remove pay or its seal instead of creating a trap.

Sources: S01, S02. Full references follow.

Charge, migration, biodegradation and preservation

Post-depositional | petroleum-system framework | mandatory system test

Reservoir deposition precedes later burial, hydrocarbon generation, migration, trapping and alteration. The regional synthesis identifies long-distance migration and biodegradation as major features of western Mannville accumulations [S18].

Documentary entry: no independently resolved numerical layer for this named unit.

Published observations

- A central porous carbonate or sand cannot be assigned the same charge history merely because a western analogue produces.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Work outward from a documented same-interval pool only after testing connectivity, sealing and charge continuity.

Criteria for a producing reservoir

- Use oil/source biomarkers and maturity, shows corrected for contamination, fluid contacts, pressures and water chemistry. Establish that the trap existed before charge and survived later uplift.

Evidence that weakens the idea

- Organic-rich rock can be immature; migrated oil can be degraded or leaked; good porosity can contain only formation water.

Sources: S18. Full references follow.

2. Cambrian to Silurian: marine clastics and a warm carbonate platform

Basal clastics and younger carbonate sheets were modified by repeated emergence and erosion. Their northern and eastern limits require preservation checks. Regional aquifer quality is not evidence of hydrocarbon charge.

See Figure 9 - Time-dependent basin and petroleum-system evolution (earlier in this study).

See Figure 6 - Published zero edges, erosion, thinning and model support (earlier in this study).

Basal Cambrian sandstone

Cambrian | informal basal unit | conditional deep clastic reservoir

Marine transgression across irregular basement reworked nearshore quartz sand before finer shelf sediment accumulated [S19].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Deadwood. These are not substitute member tops.

Published observations

- The regional framework distinguishes a basal sandstone beneath the Earlie in western Saskatchewan.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a preserved clean sand against basement relief or a sealing facies termination.

Criteria for a producing reservoir

- Confirm grain size, cement, connected pores and fluid saturation from core and logs; prove closure and a viable migration route.

Evidence that weakens the idea

- A saline aquifer can have excellent sand quality without oil. The whole Deadwood numerical interval must not be relabelled as this basal sand.

Sources: S19, L-earlie. Full references follow.

Earlie Formation

Middle Cambrian | formation | conditional reservoir / fine-grained cover

Glauconitic siltstone, fine sandstone and shale record a marine shelf. The formation thins eastward in Saskatchewan [L-earlie].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Deadwood. These are not substitute member tops.

Published observations

- The formal reference section is near Lloydminster on the Alberta side; it is an external reference, not a Saskatchewan pool.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Look for laterally enclosed cleaner sandstone beds or a preserved edge with sealing cover.

Criteria for a producing reservoir

- Separate permeability-bearing sand from radioactive glauconitic or clay-rich beds; tie the Pika marker only where demonstrable.

Area significance

Western framework near Lloydminster; eastward presence requires control.

Evidence that weakens the idea

- No independent Earlie numerical surface is supplied here. A broad basement-to-Deadwood interval is not an Earlie reservoir thickness.

Sources: L-earlie, S19. Full references follow.

Deadwood Formation

Late Cambrian-Early Ordovician | formation | conditional deep reservoir

Quartz-rich marine sand, silt, shale and subordinate carbonate accumulated on the interior platform; younger erosion modified the preserved package [L-deadwood].

Numerical layers: Deadwood.

Published observations

- West of central Saskatchewan it can overlie Earlie rather than basement; nomenclature changes matter for gross thickness.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Cleaner basal or upper sand bodies with sealing shale are conditional targets.

Criteria for a producing reservoir

- Tie both contacts, distinguish original thinning from truncation, and require a source-to-reservoir migration test.

Evidence that weakens the idea

- A regional top and gross interval do not resolve net sand, pore-throat connectivity or fluid phase.

Sources: L-deadwood, S19. Full references follow.

Winnipeg Formation / Group

Ordovician | formation / regional group usage | conditional reservoir and seal pair

Quartzose sandstone below finer marine shale records renewed flooding of an erosional surface [L-winnipeg].

Numerical layers: Winnipeg.

Published observations

- The formation does not extend uniformly to the Alberta border; its lower contact oversteps older rocks eastward.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test basal sand near a well-supported lateral termination or preserved paleorelief, with shale cap intact.

Criteria for a producing reservoir

- Use sand and shale subdivisions rather than gross Winnipeg thickness; verify charge and water-bearing connectivity.

Evidence that weakens the idea

- A useful regional aquifer or CO2-storage analogue is not proof of an oil pool.

Sources: L-winnipeg, S20. Full references follow.

Black Island sandstone

Ordovician | member / formation in regional usage | conditional clastic reservoir

The lower sandy Winnipeg subdivision represents nearshore clastic deposition during marine flooding [L-black-island].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Winnipeg. These are not substitute member tops.

Published observations

- Name and rank vary across the Williston region. The lexicon interprets its western edge in Saskatchewan chiefly as nondeposition; that differs from a generic model-support edge.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate a clean porous sand lens beneath continuous fine-grained cover.

Criteria for a producing reservoir

- Confirm the local name and sandstone interval with logs and samples; compare adjacent wet wells.

Evidence that weakens the idea

- No separate Black Island surface or oil-water contact is derived from the Winnipeg top.

Sources: L-black-island, L-winnipeg. Full references follow.

Ice Box shale

Ordovician | member / formation in regional usage | potential seal

Fine-grained marine deposition followed the sandy part of the Winnipeg succession [L-ice-box].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Winnipeg. These are not substitute member tops.

Published observations

- The lexicon records thinning to zero in central and north-central Saskatchewan. The cap must be demonstrated at the selected location; Winnipeg sandstone can survive beyond it.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test cap continuity above basal Winnipeg sands.

Criteria for a producing reservoir

- Require shale thickness, fault integrity and pressure/seal evidence at the scale of a proposed closure.

Evidence that weakens the idea

- Shale presence alone establishes neither capillary capacity nor oil generation.

Sources: L-ice-box, L-winnipeg. Full references follow.

Red River: Yeoman and Herald carbonate cycles

Late Ordovician | formation / subsurface subdivisions | conditional carbonate reservoir / internal seals

Open shallow-marine carbonate deposition passed into more restricted carbonate-evaporite cycles. Yeoman and Herald names distinguish parts of this succession [L-red-river].

Numerical layers: Red River.

Published observations

- Regional northern preservation is controlled partly by later erosion [S20].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Porous dolomitized or grain-supported beds, locally capped by evaporitic or tight carbonate facies, merit conditional testing.

Criteria for a producing reservoir

- Use petrography, connected porosity, permeability and water saturation; tie internal cycles rather than projecting a southeast Saskatchewan pool laterally.

Evidence that weakens the idea

- Dolomite, a structural high and an anhydrite bed can coexist in a water-filled system. Charge is a separate central-region risk.

Sources: L-red-river, S20. Full references follow.

Stony Mountain Formation

Late Ordovician | formation | conditional carbonate reservoir / baffle

Fossiliferous muddy carbonate and shaly beds pass laterally toward cleaner northern dolomite; Gunn/Hartaven/Gunton terminology depends on the regional scheme [L-stony-mountain].

Numerical layers: Stony Mountain.

Published observations

- The lithologic contrast between lower shaly and upper dolomitic parts is not uniform across Saskatchewan.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test localized porous dolomite and the sealing effect of muddy beds.

Criteria for a producing reservoir

- Correlate local cycles and measure permeability; confirm the unit survives beneath younger unconformities.

Evidence that weakens the idea

- A low gamma-ray carbonate is not automatically porous; regional member labels may overstate local resolution.

Sources: L-stony-mountain. Full references follow.

Stonewall Formation

Latest Ordovician-Early Silurian | formation | conditional carbonate reservoir

Dolomite with sandy or argillaceous markers and local evaporite beds records a shallow, intermittently restricted platform [L-stonewall].

Numerical layers: Stonewall.

Published observations

- Marker beds and disconformities help separate cycles; the present northern limit need not be a depositional shoreline.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate porous cycle interiors enclosed by tight marker or evaporitic beds.

Criteria for a producing reservoir

- Require independent control on top, base, permeability and truncation.

Evidence that weakens the idea

- Subtle log markers may be missed in older records; an apparent thickness anomaly can be a correlation error.

Sources: L-stonewall. Full references follow.

Interlake carbonate succession

Silurian | group / formation in subsurface usage | conditional carbonate reservoir / unconformity context

Dolomitized shallow-platform deposits include skeletal, ooid, stromatolitic and locally biohermal beds separated by exposure-related markers [L-interlake].

Numerical layers: Interlake.

Published observations

- The Devonian Ashern overlies a major unconformity; Interlake subunits are difficult to correlate consistently in the subsurface.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test preserved shoal or leached zones beneath an intact later cap.

Criteria for a producing reservoir

- Separate fabric-selective porosity, fractures, cement-filled cavities and meteoric alteration; verify migration and seal.

Evidence that weakens the idea

- Karst may be tight, water-flushed or breached. No fine Interlake member meshes are implied.

Sources: L-interlake, S20. Full references follow.

3. Middle Devonian: banks, interbank facies, salt and central Saskatchewan

The Saskatoon-Humboldt-Watrous-Wynyard sector is relevant to the carbonate-evaporite system and salt preservation. Reefal relief, secondary porosity, potash and petroleum charge are different observations. Modern subsidence or salt loss must be separated from original carbonate-bank geometry.

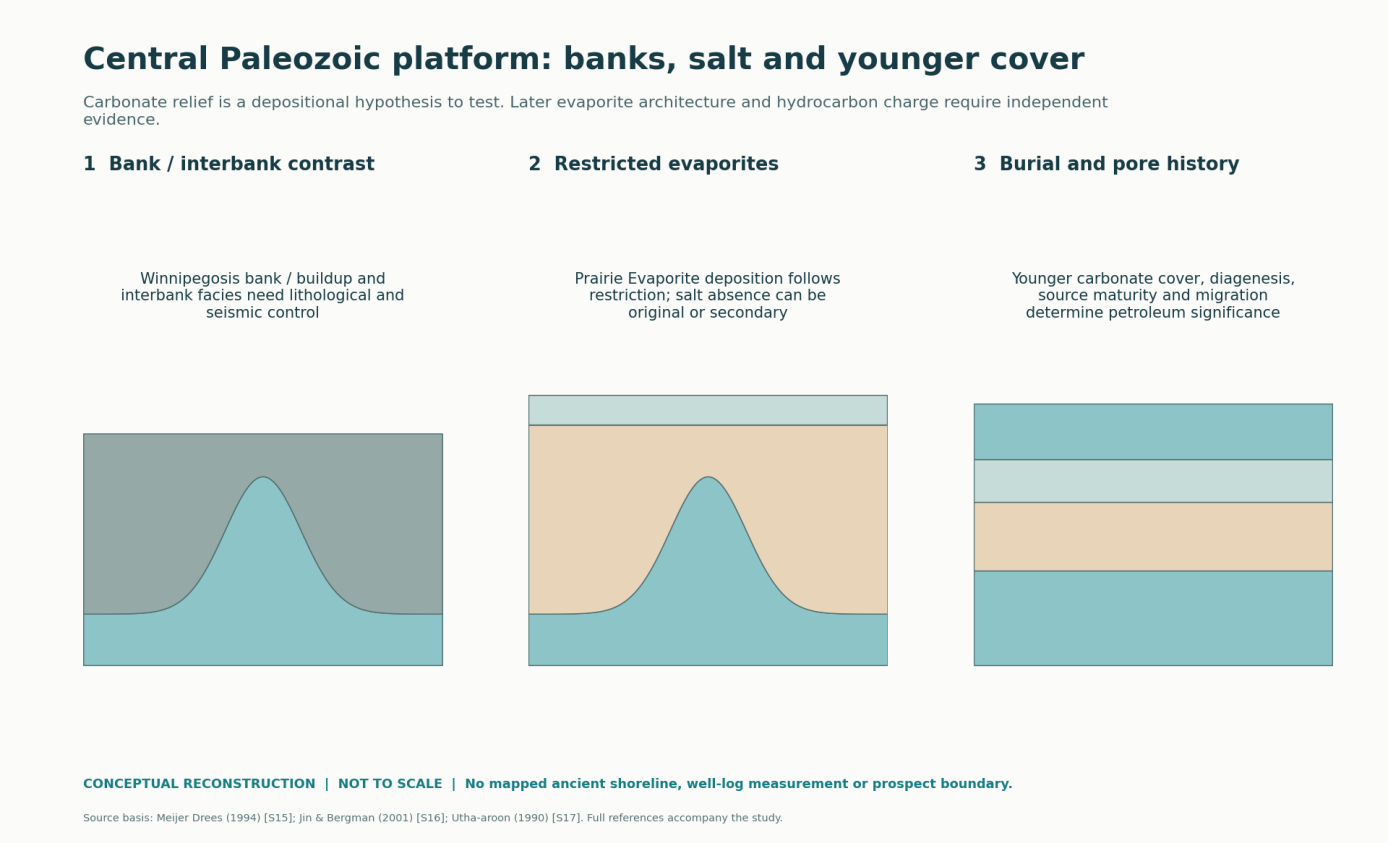


Figure 10. Conceptual sequence for testing bank/interbank geometry, evaporite restriction and younger cover. The drawing does not locate a reef or assert that central Saskatchewan carbonate relief is oil-charged. Potash/salt presence and hydrocarbon reservoir quality are separate questions. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S15, S16, S17.

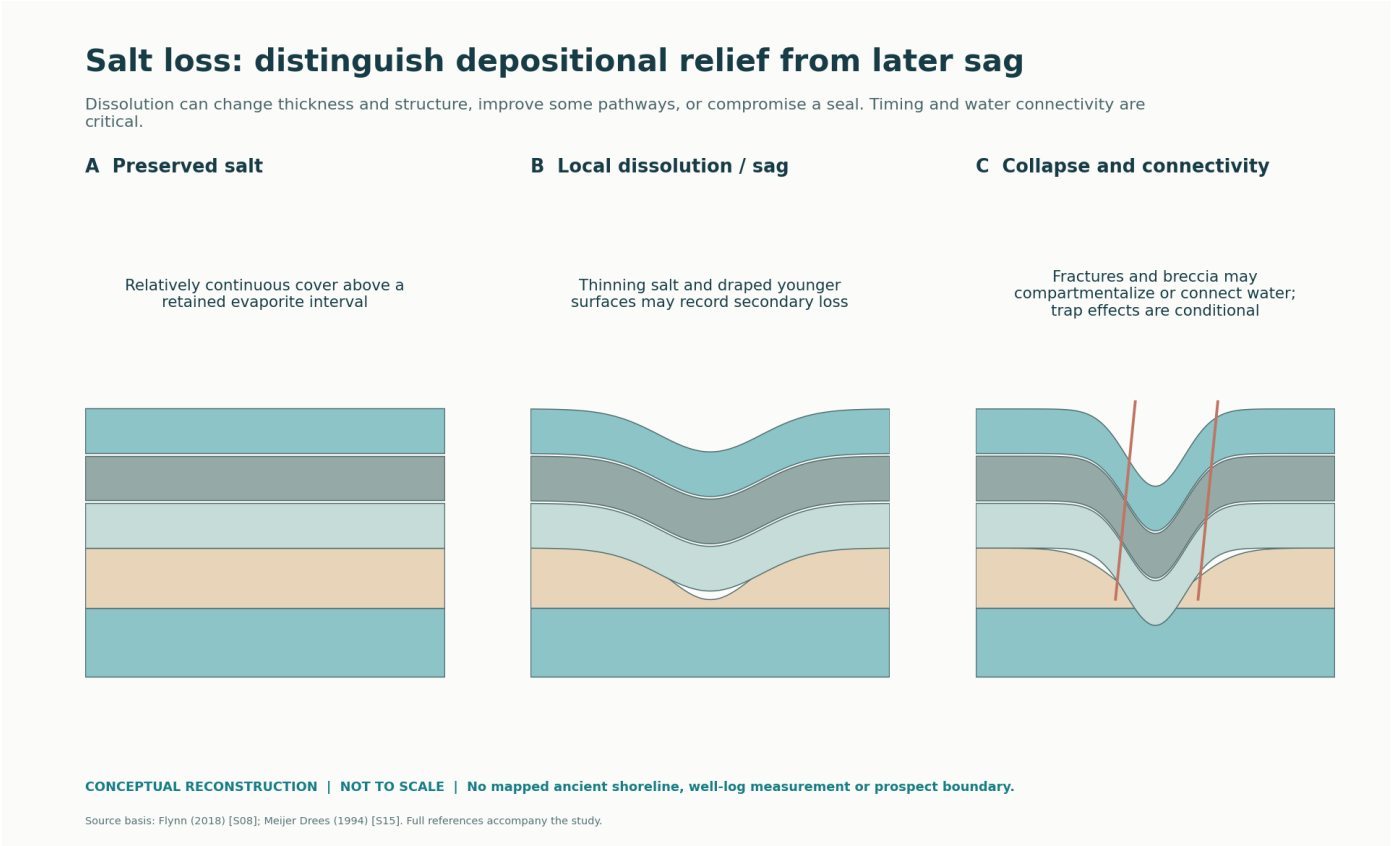


Figure 11. Conceptual alternatives. A local high or low is not automatically a salt-dissolution feature. Compare several horizons, retained salt thickness, core/breccia evidence, seismic discontinuities and hydrogeology before assigning a mechanism or reservoir benefit. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S08, S15.

See Figure 1 - Evidence sequence for hydrocarbon screening (earlier in this study).

Meadow Lake Formation: northern regional context

Early-Middle Devonian regional framework | formation | documentary northern context

Dolomite, limestone, mudstone and local basal sandstone represent a northern carbonate-restricted-basin succession beneath Winnipegosis [L-meadow-lake; S15].

Documentary entry: no independently resolved numerical layer for this named unit.

Local preservation

No supported numerical layer in the current WCC clip.

Published observations

- Meadow Lake/Ashern relationships change across the Meadow Lake escarpment. The present WCC model has no supported Meadow Lake layer.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No local mapped petroleum target is proposed; first establish a retained interval before evaluating porous sand or carbonate.

Criteria for a producing reservoir

- Tie the accepted regional nomenclature and the sub-Devonian surface to actual wells.

Evidence that weakens the idea

- The town/formation name and northern analogues cannot establish occurrence within this clip.

Sources: L-meadow-lake, S15. Full references follow.

Ashern Formation

Middle Devonian | formation | potential basal seal / onlap marker

Red and green muddy, dolomitic basal deposits record transgression across an exposed older carbonate surface [S15; L-ashern].

Numerical layers: Ashern.

Published observations

- The lower contact is a major preservation boundary; patchy fill can mark relief rather than a reservoir.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Assess basal cover and lateral seal over an older porous carbonate remnant.

Criteria for a producing reservoir

- Establish thickness and continuity of mud-rich beds; check where the unit is absent.

Evidence that weakens the idea

- Red-bed color does not prove impermeability. Weblex age metadata contains an anomalous Triassic phrase; the accepted Devonian placement is used.

Sources: S15, L-ashern. Full references follow.

Winnipegosis Formation: platform, banks and interbank facies

Middle Devonian | formation | conditional carbonate reservoir

A carbonate platform supports localized higher-relief buildups beside lower-energy interbank deposits. Subsequent restricted-basin sedimentation enclosed that relief [S15; L-winnipegosis].

Numerical layers: Winnipegosis.

Published observations

- A formation thickness high can represent carbonate buildup, but salt preservation and later structural modification complicate that inference.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a core/seismic-supported porous buildup or grain-supported margin beneath continuous sealing evaporites.

Criteria for a producing reservoir

- Resolve buildup geometry from interbank fill; measure dolomitization, anhydrite cement and effective pores. Require local maturity or a demonstrated migration path.

Area significance

Central platform and western subsurface; no speculative reef polygons supplied.

Evidence that weakens the idea

- Meadow Lake and southeast Saskatchewan reef examples are external analogues, not discoveries in this window. Many central banks can be cemented or uncharged.

Sources: S15, L-winnipegosis, S18. Full references follow.

Brightholme / interbank organic carbonate context

Middle Devonian | documentary member / facies | possible source facies; maturity unproven locally

Organic-rich laminated interbank carbonate is distinct from adjacent buildup facies; the revised Winnipegosis framework discusses Brightholme terminology [S16].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Winnipegosis. These are not substitute member tops.

Published observations

- The regional petroleum synthesis identifies organic-rich Winnipegosis basin facies but shows that maturity is geographically restricted [S18].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test source potential only where sampled organic matter, maturity and expulsion support it.

Criteria for a producing reservoir

- Collect TOC, Rock-Eval and petrographic maturity data, screen drilling contamination, and compare produced-oil fingerprints.

Evidence that weakens the idea

- An organic-rich laminite can remain immature. This entry does not establish a source kitchen under Saskatoon.

Sources: S16, S18. Full references follow.

Ratner carbonate-evaporite transition

Middle Devonian | revised formation / legacy member | transition / potential baffle

Laminated carbonate-anhydrite successions record increasing salinity between Winnipegosis carbonate deposition and Prairie Evaporite accumulation. Jin and Bergman revised Ratner rank and placement [S16].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Winnipegosis, Prairie Evaporite. These are not substitute member tops.

Published observations

- Older well picks and regional meshes may incorporate the interval differently.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate its role as low-permeability cover or baffle around carbonate relief.

Criteria for a producing reservoir

- Reconcile legacy Winnipegosis/Prairie picks against actual core and logs before calculating a reservoir interval.

Evidence that weakens the idea

- There is no independent Ratner model top here; a broad top difference must not be called Ratner thickness.

Sources: S16, S15. Full references follow.

Prairie Evaporite Formation

Middle Devonian | formation | regional seal / accommodation and integrity control

Restricted brines accumulated halite, anhydrite and potash-bearing salts after the open carbonate-platform phase. Published Saskatoon work describes variable brine-pool, salt-pan and exposure processes [S15; S17].

Numerical layers: Prairie Evaporite.

Published observations

- Its present thickness reflects deposition, subsequent salt loss and the correlation definition; those effects must be separated.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Assess seal preservation above carbonate targets and accommodation changes in younger strata over salt-loss zones.

Criteria for a producing reservoir

- Tie salt base and top, non-salt markers, seismic disturbance and overburden isopachs; date collapse relative to reservoir deposition and charging.

Area significance

Central potash district and preserved western evaporite basin.

Evidence that weakens the idea

- Salt thinning is not an oil indicator. Dissolution can breach containment; potash mineralization is not a petroleum reservoir.

Sources: S15, S17, L-prairie-evaporite. Full references follow.

Esterhazy, Belle Plaine and Patience Lake potash intervals

Middle Devonian | Prairie Evaporite documentary subdivisions | evaporite context

Potash-bearing salt intervals represent concentrated evaporitic conditions within the Prairie succession. Their local mine and core stratigraphy is finer than this petroleum model [S17].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Prairie Evaporite. These are not substitute member tops.

Published observations

- Neither the regional Prairie top nor gross salt thickness locates individual mineralized beds.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Use these intervals as stratigraphic/evaporite context when assessing cover integrity, not as oil targets.

Criteria for a producing reservoir

- Obtain actual potash core correlations and dissolution mapping if an overburden-structure hypothesis depends on a particular salt bed.

Evidence that weakens the idea

- No mineral resource estimate, mine-hazard assessment or individual potash horizon is provided.

Sources: S17, L-prairie-evaporite. Full references follow.

Second Red Bed Member

Middle Devonian | member / regional marker | potential baffle / marker

A red, fine-grained interval near the base of the Dawson Bay succession separates evaporite history from renewed carbonate deposition [L-manitoba; S15].

Numerical layers: 2nd Red Bed.

Published observations

- Its name is stratigraphic, not a guarantee of identical lithology or continuous seal everywhere.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test cap continuity above older carbonate or evaporite dissolution relief.

Criteria for a producing reservoir

- Tie the exact marker, thickness and local erosional gaps.

Evidence that weakens the idea

- Do not confuse it with the younger First Red Bed below Souris River cycles.

Sources: L-manitoba, S15. Full references follow.

Dawson Bay Formation

Middle Devonian | formation | conditional carbonate reservoir / cover

Renewed marine carbonate deposition was followed by restricted carbonate and evaporitic conditions, with local member terminology including Neely and Hubbard [S21; L-dawson-bay].

Numerical layers: Dawson Bay.

Published observations

- The formation provides both carbonate pore-system possibilities and important cover above the Prairie succession.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate connected dolomite or grain-supported beds, especially where a demonstrable seal and charge route coexist.

Criteria for a producing reservoir

- Separate depositional facies from dissolution/fracture permeability; test pressure communication with adjacent saline aquifers.

Evidence that weakens the idea

- High water transmissivity does not establish an oil accumulation; salt-related fractures may reduce sealing.

Sources: S21, L-dawson-bay. Full references follow.

First Red Bed Member

Middle Devonian | member / marker | marker / potential baffle

A fine-grained basal interval precedes the main Souris River carbonate cycles and records the transition between depositional episodes [S21; L-manitoba].

Numerical layers: 1st Red Bed.

Published observations

- It is separate from the older Second Red Bed.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test its local continuity as a baffle above Dawson Bay.

Criteria for a producing reservoir

- Use a consistent correlation datum and core-calibrated shale identification.

Evidence that weakens the idea

- A regional marker surface contains no direct measurement of seal entry pressure.

Sources: S21, L-manitoba. Full references follow.

Souris River Formation: Davidson, Harris and Hatfield cycles

Middle-Late Devonian | formation with members | conditional cyclic carbonate reservoir

Repeated shallow-marine carbonate to restricted/evaporitic cycles built the Souris River shelf; the regional shelf prograded toward the northwestern basin [S21; L-souris-river].

Numerical layers: Souris River.

Published observations

- The shelf relationship differs from simply placing an Alberta Swan Hills reef beneath a central Saskatchewan location.

Local and regional orientation

Regional basinward progradation northwest in the atlas synthesis; no exact local shoreline is mapped.

Reservoir environments to investigate

- Test porous cycle interiors and local shoals enclosed by muddy or evaporitic beds.

Criteria for a producing reservoir

- Correlate individual cycles, characterize dolomitization and cement, and establish charge independently.

Evidence that weakens the idea

- Gross thickness, regional progradation direction and a carbonate name do not locate a reservoir-quality shoal.

Sources: S21, L-souris-river. Full references follow.

4. Late Devonian: carbonate cycles, northern truncation and western Bakken

Older Paleozoic rocks subcrop beneath the Cretaceous progressively northward. Western Bakken contains a documented conventional heavy-oil sandstone system, with tidal/marginal-marine facies and later erosional preservation controls. That western system cannot be projected as a continuous Bakken fairway across central Saskatchewan.

See Figure 6 - Published zero edges, erosion, thinning and model support (earlier in this study).

See Figure 10 - Central Paleozoic carbonate-evaporite architecture (earlier in this study).

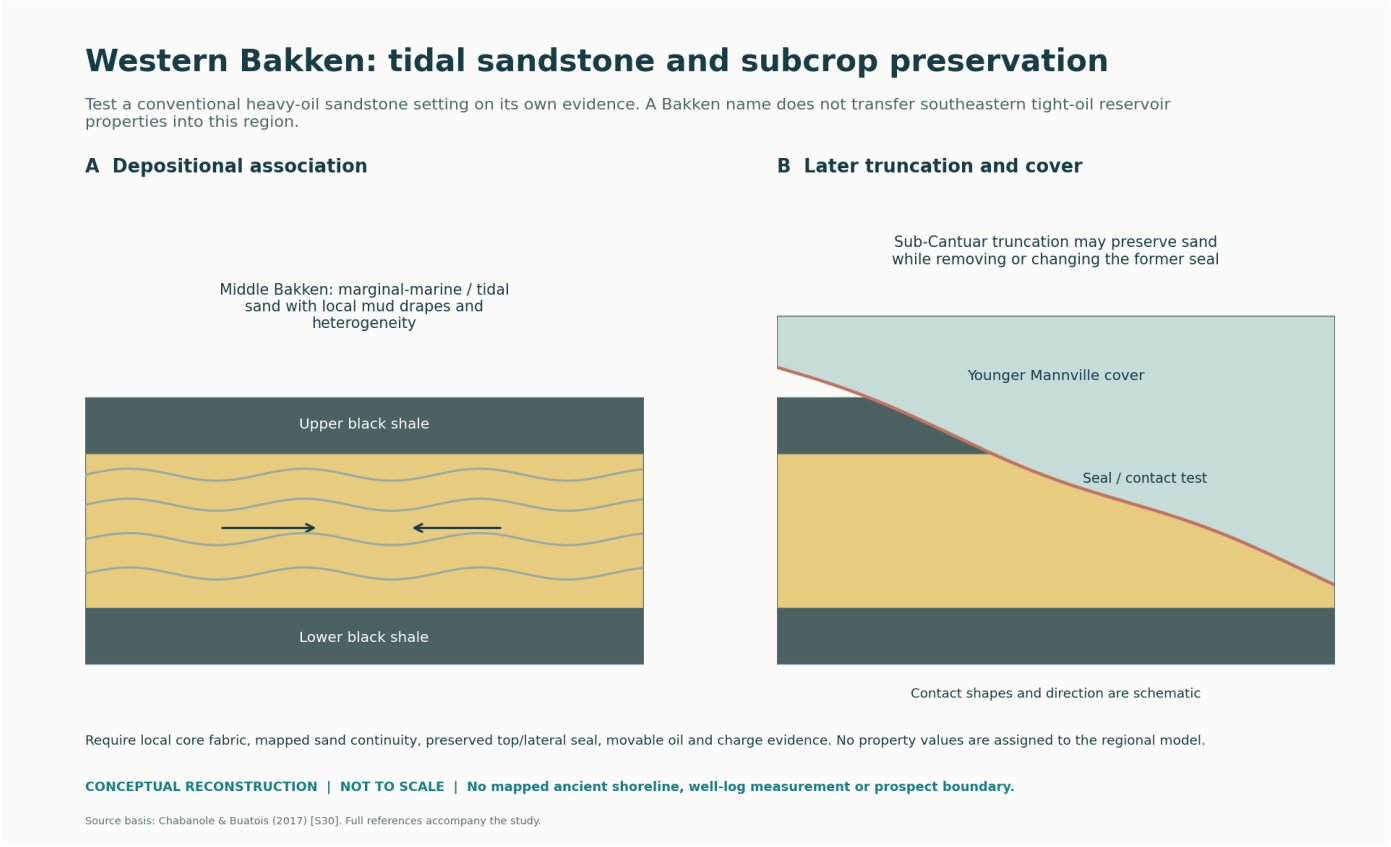


Figure 12. Original conceptual model informed by Chabanole & Buatois (2017). Western middle Bakken tidal/marginal-marine sandstone and later sub-Cantuar truncation create conditional preservation and seal questions. No mapped subcrop, oil-water contact, local measured log or fixed cardinal direction is reproduced. Published field-scale rock properties are not regional grid parameters. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S30.

Duperow Formation

Late Devonian | formation | conditional carbonate reservoir / structural datum

Cyclic shallow carbonate, dolomite and evaporitic deposits represent a platform setting, locally with more open and more restricted parts [L-duperow; S22].

Numerical layers: Duperow.

Published observations

- The type well is Tidewater Duperow Crown No.1, 4-9-35-16W3; the formation is reduced by erosion north/east of its Birdbear cover [L-duperow].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test porous shoal/dolomite beds or a preserved subcrop beneath effective cover.

Criteria for a producing reservoir

- Tie internal cycles, compare reservoir and tight intervals in core, and test whether subcrop access supplied charge or freshwater flushing.

Well, core and log evidence

- uwi: 4-9-35-16W3; evidence: Lexicon type locality. Historical type interval was revised; use the revised definition and verify full well event before joining to current inventory.; source: L-duperow; page: Type Locality

Evidence that weakens the idea

- A Duperow structural trough may record Prairie salt loss; thickness alone cannot identify a reef or petroleum column.

Sources: L-duperow, S22, S08. Full references follow.

Birdbear Formation

Late Devonian | formation | conditional carbonate reservoir

A lower carbonate-dominated phase and more restricted upper facies form a short platform succession. The lexicon records strong lower-member development around Kindersley-Rosetown [L-birdbear].

Numerical layers: Birdbear.

Published observations

- Regional preservation narrows northward; gross thickening is not a porosity measurement.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test local porous carbonate beneath an intact cap near supported subcrop or closure.

Criteria for a producing reservoir

- Separate dolomitization from pore-filling cement and verify seal continuity above the target.

Area significance

Kindersley-Rosetown setting; extension north/east is preservation-limited.

Evidence that weakens the idea

- An unusually thick member may be tight, water-bearing or laterally open.

Sources: L-birdbear, S22. Full references follow.

Torquay Formation

Late Devonian | formation | conditional carbonate/clastic reservoir; preservation risk

Silty dolomite, mud-rich beds and evaporitic/exposure cycles record a restricted shallow platform with repeated breaks [L-torquay; S23].

Numerical layers: Torquay.

Published observations

- The northern distribution is an erosional limit in central Saskatchewan south of Saskatoon, not a present-day line of beach sand [L-torquay].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test preserved porous intervals beneath a sealing overburden and connected to a viable charge system.

Criteria for a producing reservoir

- Resolve missing section, internal disconformities and completion-zone naming.

Evidence that weakens the idea

- A Torquay play in southeast Saskatchewan cannot be transferred northward through absent rock.

Sources: L-torquay, S23. Full references follow.

Big Valley Formation

Latest Devonian | formation | conditional remnant reservoir

Marine carbonate and shale record renewed flooding above restricted older deposits [L-big-valley; S23].

Numerical layers: Big Valley.

Published observations

- Thin retained sections require a precise contact tie rather than a broad Wabamun or Three Forks label.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate a localized porous carbonate interval only where the unit is preserved and sealed.

Criteria for a producing reservoir

- Require core/log confirmation, permeability and a demonstrated petroleum-system link.

Evidence that weakens the idea

- Sparse deep wells and erosional loss can dominate the uncertainty more than depositional environment.

Sources: L-big-valley, S23. Full references follow.

Bakken Formation: western tidal sandstone and black-shale members

Latest Devonian-Early Mississippian | formation | documented conventional western sandstone reservoir

Western middle Bakken includes fine sandstone interpreted as tidal and marginal marine between open-marine shale episodes. Its conventional heavy-oil reservoir character differs from the southeastern tight-sand/siltstone play [S30; S31].

Numerical layers: Bakken.

Published observations

- Post-Mississippian erosion associated with the sub-Cantuar drainage network changes preserved thickness [S30]. Official pools include Coleville, Hoosier, Buffalo Coulee and Dodsland West Bakken [S28].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test preserved sandy middle-member bodies beside known pools, including remnant margins beneath suitable Mannville cover.

Criteria for a producing reservoir

- Separate original depositional sand thickness from erosion; confirm surviving cap, core permeability, oil saturation and pressure connectivity.

Quantitative examples: source scope only

- value: porosity commonly >25%; permeability commonly >1 Darcy; meaning: Published studied western fine sandstone, not all Bakken, not a regional model parameter or universal cutoff; source: S30; page: Abstract

Area significance

Coleville-Hoosier-Cactus Lake-Buffalo Coulee western system; extensions need individual preservation and charge tests.

Evidence that weakens the idea

- Truncation may remove shale cover or expose sand to water. Sand quality and the presence of black shale do not prove local generation or remaining recoverable oil.

Sources: S30, S31, L-bakken, S18, S28. Full references follow.

5. Mississippian: southern carbonate context and missing northern section

Mississippian platform and ramp units are included to complete the stratigraphic account. The current clipped source model has no supported Souris Valley, Tilston, Alida, Kisbey, Frobisher, Midale or Ratcliffe surfaces. Absence of a modeled layer is kept distinct from a verified geological absence at an individual well.

See Figure 9 - Time-dependent basin and petroleum-system evolution (earlier in this study).

See Figure 6 - Published zero edges, erosion, thinning and model support (earlier in this study).

Madison carbonate succession

Mississippian | group / formation in regional usage | documentary carbonate framework

The regional succession contains open-marine carbonate ramp, skeletal shoal and restricted evaporitic facies [S24; L-madison].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No undifferentiated Madison mesh; local preserved remnants require independent well proof.

Published observations

- Post-Mississippian erosion strongly controls northern preservation. The major southeast and southwest producing subdivisions cannot be projected across the whole WCC window.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- First test whether any target unit is actually preserved; only then evaluate leached or dolomitized carbonate under intact cover.

Criteria for a producing reservoir

- Use penetrations below the sub-Mesozoic surface, age-diagnostic samples and a named-unit correlation.

Evidence that weakens the idea

- No reservoir body is created in areas lacking source support. A regional analogue is not an in-window discovery.

Sources: S24, L-madison. Full references follow.

Souris Valley / Lodgepole context

Lower Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

Lower-ramp muddy and skeletal carbonate context; separate basinal lime mud from shoal or mound fabric. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

Tilston interval

Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

Shallow carbonate-ramp context; a grain-supported facies must be demonstrated in a retained section. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

Alida interval

Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

Carbonate shoal and restricted-platform context in the southern basin; dolomitization alone does not establish connected pores. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

Kisbey / K-2 regional marker

Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

A regional clastic/marker name; lithology and presence must be established locally rather than inferred from southern nomenclature. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

Frobisher interval

Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

Shallow carbonate and evaporitic-cycle context; local cap and reservoir continuity would need demonstration. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

Midale interval

Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

Southern carbonate-ramp reservoir/seal context; named southeast Saskatchewan facies are not mapped in this window. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

Ratcliffe / Charles context

Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

Restricted carbonate-evaporite cycles in the southern succession; preserve separate reservoir and evaporite components. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

Poplar and Big Snowy remnants

Late Mississippian | regional subdivision / documentary context | documentary; unsupported locally at model resolution

Younger carbonate, shale and clastic context of the southern basin, with especially limited northern preservation. [S24].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Local preservation

No supported numerical surface in the current WCC clip.

Published observations

- The clipped regional model does not support an independent surface for this entry.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No new mapped target is proposed. A verified local remnant would be an appropriate first observation to investigate.

Criteria for a producing reservoir

- Establish actual presence, stratigraphic identity and preservation before applying any southern reservoir analogue.

Evidence that weakens the idea

- A surface imported from an adjacent regional build would fabricate coverage here.

Sources: S24. Full references follow.

6. Permian to earliest Cretaceous: hiatuses, restricted seas and preserved remnants

Watrous, Gravelbourg and Lower Shaunavon have limited supported geometry at the southern margin. Younger Jurassic units are mainly documentary context or preserved-remnant questions. The town of Watrous is not evidence that the entire Watrous Formation lies beneath every nearby location.

See Figure 9 - Time-dependent basin and petroleum-system evolution (earlier in this study).

See Figure 6 - Published zero edges, erosion, thinning and model support (earlier in this study).

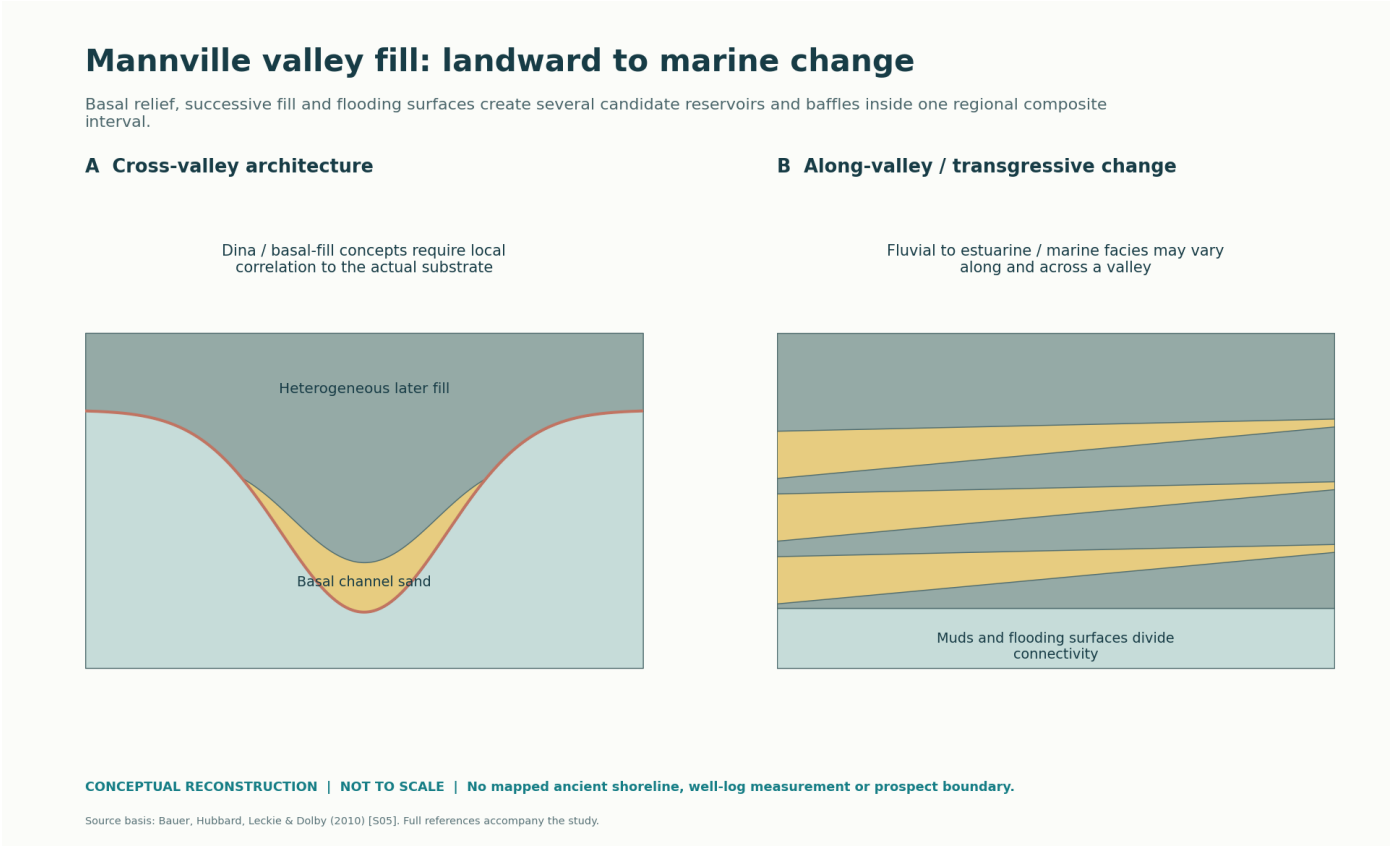


Figure 13. Conceptual valley architecture applicable to the source-based Mannville discussion. Incision, facies transitions and internal sealing muds must be mapped independently. No universal valley azimuth, valley width or connected sand proportion is assigned. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S05.

Permian-Triassic interval and prolonged exposure

Permian-Triassic | hiatus / framework | preservation history

Large parts of the Saskatchewan platform lack preserved strata spanning this interval. Weathering and erosion modified older rocks before the later Mesozoic record [S25].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Sub-Mesozoic unconformity. These are not substitute member tops.

Published observations

- A hiatus has duration but no bed thickness; it should not be drawn as a reservoir layer.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate its consequences for paleorelief, karst, reservoir removal and later cap emplacement.

Criteria for a producing reservoir

- Demonstrate the age of the subcrop and distinguish early weathering from younger alteration.

Evidence that weakens the idea

- Exposure can create porosity, cement pores or remove the entire reservoir.

Sources: S25, S24. Full references follow.

Lower Watrous red beds

Triassic-Jurassic regional age assignment | member | potential unconformity seal

Red mud-rich deposits and local basal coarse material filled irregularities on the sub-Mesozoic surface [L-watrous].

Numerical layers: Lower Watrous.

Local preservation

Limited supported southern-margin geometry; not a blanket layer.

Published observations

- Its distribution in the lexicon is chiefly south of 52°N; the current model support is limited within this northern window.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test whether retained red beds seal an older carbonate remnant.

Criteria for a producing reservoir

- Map cap thickness and continuity from actual contacts; distinguish muddy cover from basal sand or breccia.

Evidence that weakens the idea

- Basal coarse material or erosion gaps can provide leakage paths.

Sources: L-watrous, S25. Full references follow.

Upper Watrous evaporitic interval

Triassic-Jurassic regional age assignment | member | potential seal

Anhydrite-rich cover records strongly restricted conditions after the lower red-bed phase [L-watrous].

Numerical layers: Upper Watrous.

Local preservation

Limited supported southern-margin geometry.

Published observations

- Its lateral overlap differs from that of the lower member; the two must be mapped independently.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate intact evaporite as a cap above preserved older reservoirs.

Criteria for a producing reservoir

- Check dissolution, fractures, erosional truncation and facies replacement.

Evidence that weakens the idea

- A regional evaporite top cannot establish seal continuity at a particular closure.

Sources: L-watrous, S25. Full references follow.

Lower Gravelbourg Member

Middle Jurassic | member | conditional carbonate remnant

Restricted marine carbonate with local evaporitic, algal and skeletal components records marine return [L-gravelbourg].

Numerical layers: Lower Gravelbourg.

Published observations

- The numerical model retains only limited local support for this southern interval.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a preserved porous carbonate or small shoal with effective cover.

Criteria for a producing reservoir

- Confirm the lithology in core; quantify cement and permeability rather than gross carbonate thickness.

Evidence that weakens the idea

- A small preserved remnant may have inadequate charge or be breached by younger incision.

Sources: L-gravelbourg, S25. Full references follow.

Upper Gravelbourg Member

Middle Jurassic | member | potential seal

Mud-rich marine strata overlie the lower carbonate interval [L-gravelbourg].

Numerical layers: Upper Gravelbourg.

Published observations

- Its preservation governs potential cover as much as its original depositional environment.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Assess a retained cap above older carbonate where both contacts are supported.

Criteria for a producing reservoir

- Tie shale continuity across adjacent wells and along younger erosional margins.

Evidence that weakens the idea

- A broad Jurassic interval cannot substitute for an upper-member seal isopach.

Sources: L-gravelbourg, S25. Full references follow.

Lower Shaunavon Member

Middle Jurassic | member | conditional retained carbonate

A shallow carbonate platform includes fine carbonate mud and local higher-energy skeletal or ooid deposits [L-shaunavon].

Numerical layers: Lower Shaunavon.

Published observations

- Only limited source geometry remains in the WCC clip; southwest producing-field behavior is an external analogue.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test porous carbonate in a verified remnant with preserved top and lateral cover.

Criteria for a producing reservoir

- Distinguish original grain-supported fabric, dolomitization and pore-filling cement; establish local charge.

Evidence that weakens the idea

- The southern regional oil play cannot be continued north solely by extending a plane.

Sources: L-shaunavon, S25. Full references follow.

Upper Shaunavon Member

Middle Jurassic | member | documentary context

Mixed shallow-marine sand, muddy and carbonate facies characterize the regional upper interval [L-shaunavon].

Documentary entry: no independently resolved numerical layer for this named unit.

Local preservation

Unsupported by the clipped numerical source model.

Published observations

- There is no supported Upper Shaunavon surface in this clipped model.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Document any claimed local remnant before applying tidal-channel or shoreface analogues.

Criteria for a producing reservoir

- Require positive well evidence and surviving seal; compare with a true absent-section well.

Evidence that weakens the idea

- A lower-member remnant does not imply upper-member preservation.

Sources: L-shaunavon, S25. Full references follow.

Vanguard / Rierdon-Rush Lake marine context

Middle-Late Jurassic | group / regional formations | documentary marine cover

Marine shale-dominated intervals with changing regional names record flooding above older shallow-water deposits [L-vanguard; S25].

Documentary entry: no independently resolved numerical layer for this named unit.

Published observations

- Vanguard distribution is chiefly south of this window; Rierdon has no supported numerical layer here.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate only a positively identified retained cap or sandstone-bearing remnant.

Criteria for a producing reservoir

- Reconcile regional nomenclature and the sub-Cretaceous subcrop before calculating thickness.

Evidence that weakens the idea

- Equivalent age does not mean identical facies, formation rank or sealing quality.

Sources: L-vanguard, S25. Full references follow.

Roseray Formation

Late Jurassic | formation | documentary sandstone-remnant analogue

The regional Vanguard middle sandstone represents a marine sandy episode, with subsequent erosion controlling remnant preservation [L-vanguard; S25].

Documentary entry: no independently resolved numerical layer for this named unit.

Published observations

- Well-known southwest Roseray/Success traps are outside the principal WCC evidence base.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- A preserved sand remnant encased by younger mud would be a hypothesis to test only after identifying it in local wells.

Criteria for a producing reservoir

- Separate Roseray from Success and basal Mannville; prove side-seal and pore quality.

Evidence that weakens the idea

- Historical zone labels can confuse multiple sands; no Roseray mesh or prospect is supplied.

Sources: L-vanguard, S25. Full references follow.

Masefield shale

Late Jurassic | formation | documentary seal context

Upper Vanguard marine mud provides cover where preserved [L-vanguard].

Documentary entry: no independently resolved numerical layer for this named unit.

Local preservation

No supported numerical layer in this WCC clip.

Published observations

- The current source clip has no supported Masefield layer.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Use as a preservation question above a verified older sand, not as a projected blanket seal.

Criteria for a producing reservoir

- Identify an actual local contact before invoking it in a trap model.

Evidence that weakens the idea

- Missing cover can invalidate an otherwise plausible sandstone remnant.

Sources: L-vanguard, S25. Full references follow.

Success Formation: S1, S2 and retained sandstone remnants

Late Jurassic-Early Cretaceous; correlation-dependent | formation with informal subdivisions | conditional sandstone remnant

Quartzose, locally kaolinitic sandstone remnants predate Mannville incision. Regional studies distinguish multiple Success units and emphasize their discontinuous preservation [S03; S25].

Numerical layers: Success. Context surfaces only: Sub-Success unconformity, Sub-Cantuar unconformity. These are not substitute member tops.

Published observations

- Sub-Success and sub-Cantuar surfaces are different surfaces; a preserved remnant may be surrounded by younger fill.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a clean remnant or channel body sealed laterally and above by finer sediment.

Criteria for a producing reservoir

- Resolve both erosional contacts, paleosol/kaolin versus depositional mud, and local age constraints.

Evidence that weakens the idea

- Quartz-rich sand may be permeability-poor from kaolinite/cement. A Success top does not identify S1 versus S2 or net reservoir.

Sources: S03, S25. Full references follow.

7. Mannville: Lloydminster members, Winter valleys and repeated coastal systems

The best-supported western story is a succession of distinct fluvial, estuarine, deltaic and marine sand bodies. Named pool zones are finer than the two regional Cantuar/Pense surfaces. Winter, Sparky-Waseca and Colony studies demonstrate why a single continuous sandstone belt would be an inadequate reconstruction.

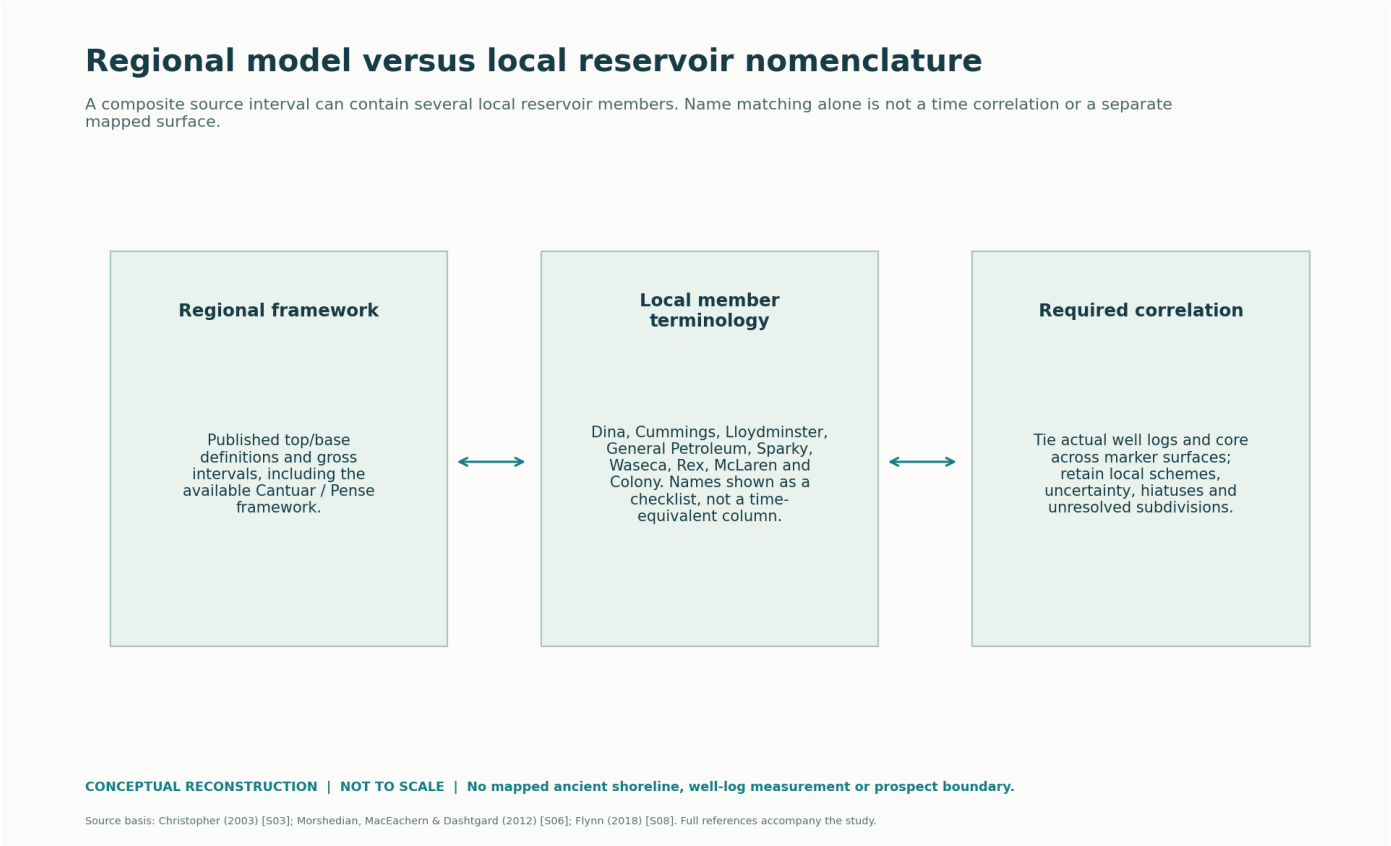


Figure 14. Nomenclature discipline diagram. The informal member checklist does not imply that each name is present throughout the study, that names are in stratigraphic order, or that a provincial composite surface locates every member top. Exact local subdivisions remain documentary until independently correlated. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S03, S06, S08.

See Figure 13 - Mannville incision, basal fill and transgression (earlier in this study).

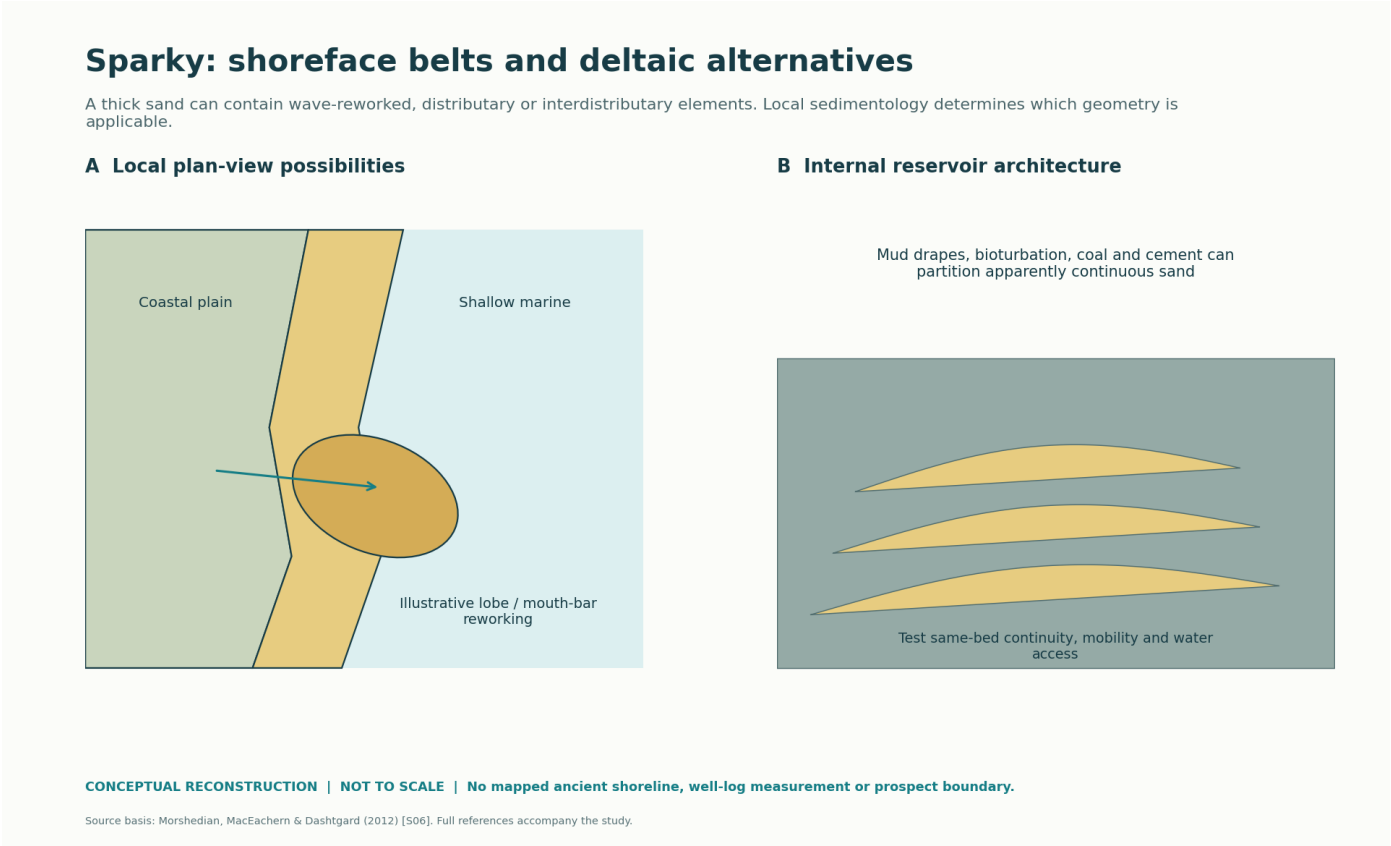


Figure 15. Conceptual plan and section, not a mapped Sparky fairway or reservoir body. Named local studies determine whether a wave-dominated shoreface, deltaic lobe or another interpretation fits a given pool. A gross sand trend does not establish connected permeability. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S06.

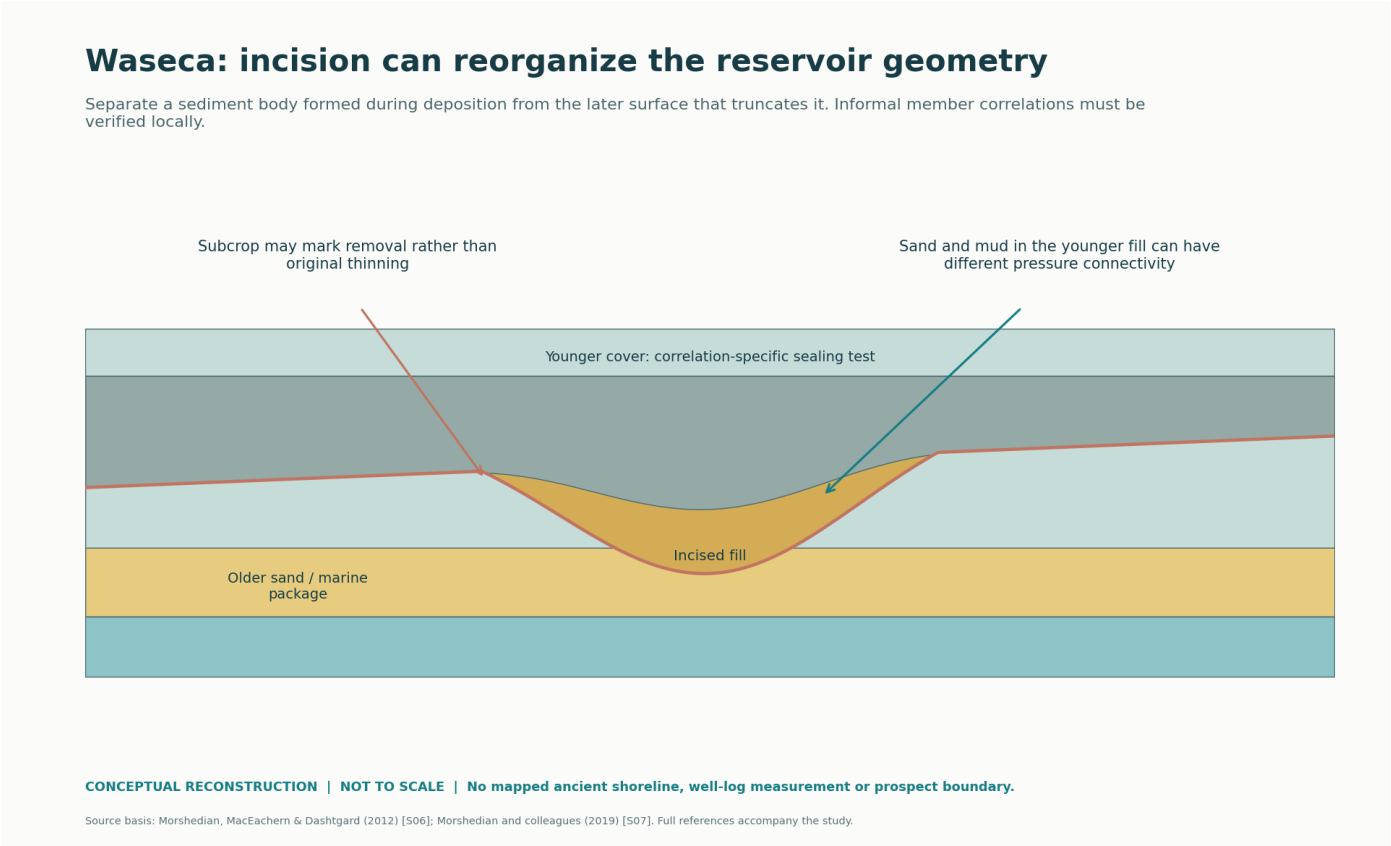


Figure 16. Conceptual expression of incision into an older package and heterogeneous younger fill. Exact Sparky/Lower Waseca/Upper Waseca/Rex/McLaren correlations and seal assignments must follow the cited local stratigraphic scheme. No universal time-equivalent member boundary is implied by the drawing. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S06, S07.

See Figure 11 - Diagnostic alternatives for evaporite-related relief (earlier in this study).

Cantuar regional interval

Early Cretaceous, Aptian-Albian | formation / regional model unit | regional container for multiple reservoir systems

Valley and coastal-plain sedimentation interacted with repeated marine incursions. Christopher uses Cantuar broadly for Dina through Waseca in the Lloydminster succession [S03].

Numerical layers: Cantuar. Context surfaces only: Sub-Cantuar unconformity. These are not substitute member tops.

Published observations

- Older lexicon usage limits Cantuar more narrowly to the southern McCloud-Dimmock Creek-Atlas scheme; the source-model definition must therefore remain visible.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test member-scale channel, estuary, delta or shoreface sand within the regional interval.

Criteria for a producing reservoir

- Use a locally calibrated reference log and map the named member independently; retain both along-body and cross-body sections.

Area significance

Lloydminster-Unity and west-central subsurface; more continental/marginal facies eastward require local evidence.

Evidence that weakens the idea

- Gross Cantuar thickness is not net pay, a particular Lloydminster member thickness or a unique depositional environment.

Sources: S03, S04, L-cantuar. Full references follow.

Dina Member

Early Cretaceous | informal member / legacy pool zone | documented western reservoir setting

At Winter, basal fluvial deposits occupy inherited sub-Cretaceous relief before later brackish inundation [S05].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Cantuar. These are not substitute member tops.

Published observations

- The Winter reconstruction is based on core/log work; the next younger Cummings incision is a separate event.

Local and regional orientation

Winter regional paleovalleys opened north-northwest according to the published study.

Reservoir environments to investigate

- Look for amalgamated channel or point-bar sand in a supported valley, with mud-rich lateral enclosure.

Criteria for a producing reservoir

- Identify the basal erosion surface, channel stacking, grain-size trends and permeability; compare channel axis with margins.

Area significance

Winter and northern/western basal Mannville examples; extrapolations need local confirmation.

Evidence that weakens the idea

- A basal low may contain mud or cemented sand. Assigning all lower Mannville wells to one connected Dina reservoir is unjustified.

Sources: S05, S03. Full references follow.

Cummings Member

Early Cretaceous | informal member / legacy pool zone | documented estuarine / valley-fill reservoir setting

Winter records brackish embayment deposits cut by a younger valley and then filled with sand during renewed relative sea-level rise [S05].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Cantuar. These are not substitute member tops.

Published observations

- A sandy valley fill and its heterolithic embayment host have different geometry and permeability.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test sand-filled incision near documented Cummings completions, including preserved valley margins and internal mud baffles.

Criteria for a producing reservoir

- Use erosion, inclined heterolithic bedding, brackish trace assemblages and log correlation together; establish seal and fluid contact.

Area significance

Winter Pool, Twp 42-43, Rge 25-26W3 in the source study.

Evidence that weakens the idea

- A straight line of horizontal wells is not independent proof of a valley edge or untested extension.

Sources: S05, S03. Full references follow.

Lloydminster Member

Early Cretaceous | informal member / legacy pool zone | reservoir / flooding-cap context

Marine and brackish flooding separates sand-rich coastal episodes; the member contains variable muddy and sandy facies within the regional Mannville succession [S03; S04].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Cantuar. These are not substitute member tops.

Published observations

- At Winter, marine Lloydminster shale follows the upper Dina-Cummings depositional history [S05].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate cleaner shoreface, deltaic or channel-related sandstone only where core/log evidence identifies it.

Criteria for a producing reservoir

- Use flooding surfaces and fossils to distinguish a marine cap from a separately deposited sand body.

Evidence that weakens the idea

- The name Lloydminster can refer to the region, a member or a pool; these are not interchangeable.

Sources: S03, S04, S05. Full references follow.

Rex Member

Early Cretaceous | informal member / legacy pool zone | conditional member-scale reservoir

The Rex lies between Lloydminster and General Petroleums in the commonly used local order. Repeated marine/coastal incursions characterize the regional interval [S03; S04].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Cantuar. These are not substitute member tops.

Published observations

- A local pool-zone label provides stratigraphic context but does not select one depositional facies.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a core-calibrated sand body close to a documented Rex completion.

Criteria for a producing reservoir

- Tie bounding flooding surfaces, inspect grain-size and ichnologic trends, and map discontinuous mud barriers.

Evidence that weakens the idea

- Source-dependent correlations and erosional amalgamation can confuse member picks; no independent Rex surface is available.

Sources: S03, S04. Full references follow.

General Petroleums (GP) Member

Early Cretaceous | informal member / legacy pool zone | conditional member-scale reservoir

The GP interval occupies the local succession between Rex and Sparky. Marine, brackish and coastal settings need to be distinguished at individual sand-body scale [S03; S04].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Cantuar. These are not substitute member tops.

Published observations

- The GP label does not provide a unique shoreline orientation or guarantee sand continuity.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a GP shoreface/delta/channel hypothesis against actual core and nearby wet wells.

Criteria for a producing reservoir

- Keep GP and Sparky pick criteria explicit and inspect both vertical and lateral facies changes.

Evidence that weakens the idea

- Do not assign a pool to the Cantuar top as if that were measured GP reservoir depth.

Sources: S03, S04. Full references follow.

Sparky Member / Alloformation

Early Cretaceous, Albian | informal member / allostratigraphic unit | documented mixed shoreface/delta reservoir setting

Published sedimentology distinguishes storm-influenced shoreface from laterally adjacent river-fed deltaic facies, with channels and coastal-plain deposits [S06].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Cantuar. These are not substitute member tops.

Published observations

- Facies association, trace-fossil stress and bounding surfaces jointly support the interpretation; coarsening-upward logs alone do not.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test cleaner shoreface sheets, delta-front sand and distributary bodies with preserved mud caps near named Sparky pools.

Criteria for a producing reservoir

- Compare along-strike and dip sections; document mud drapes, amalgamation, cement and pressure compartmentalization.

Area significance

Lloydminster district; exact facies boundaries are not mapped by the regional top.

Evidence that weakens the idea

- A productive sector can pass laterally into muddy delta or offshore deposits within the same named interval.

Sources: S06, S03. Full references follow.

Waseca: lower coastal cycles and upper incised-valley fill

Early Cretaceous, Albian | informal member / alloformation with subunits | documented reservoir systems and erosional surface

Lower Waseca coastal progradation was interrupted by exposure and incision; upper deposits include valley/estuarine and transgressive-bay fill [S06; S07].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Cantuar. These are not substitute member tops.

Published observations

- The later study reports valleys locally reaching 34 m incision, with paleosol/root evidence on interfluves [S07].

Local and regional orientation

Published Lower Waseca sections deepen toward north/northwest; this is interval- and study-specific.

Reservoir environments to investigate

- Test preserved lower shoreface/delta sands separately from upper valley-fill sand.

Criteria for a producing reservoir

- Locate the internal erosional contact using truncation and core; establish fill architecture, mud barriers and fluid contacts.

Quantitative examples: source scope only

- value: up to 34 m incision; meaning: Maximum reported in the 2019 study, not regional relief or a mapped valley depth; source: S07; page: Abstract

Evidence that weakens the idea

- The Waseca top is not its internal unconformity. Incision can remove an older reservoir or juxtapose aquifer and pay.

Sources: S06, S07. Full references follow.

Pense regional interval

Early Cretaceous, Albian | formation / regional model unit | regional container for upper Mannville reservoirs

The regional upper Mannville interval includes renewed coastal progradation and later valley-fill/coastal deposits. Christopher places McLaren and Colony in Pense [S03].

Numerical layers: Pense.

Published observations

- Pense is the coarse model unit; McLaren and Colony need separate local reference picks.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test member-specific reservoir bodies and their bounding flooding/erosion surfaces.

Criteria for a producing reservoir

- Reconcile the regional correlation with the local pool and completion nomenclature.

Evidence that weakens the idea

- A Pense mesh cannot resolve sub-kilometre Colony channels or give their pool depths.

Sources: S03, S08. Full references follow.

McLaren Member / Alloformation

Early Cretaceous, Albian | informal member / allostratigraphic unit | documented coastal reservoir setting

Marine flooding above Upper Waseca was followed by a renewed progradational coastal succession in the published sequence model [S06].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Pense. These are not substitute member tops.

Published observations

- Its relation to Waseca is tied by bounding surfaces, not merely parallel log tops.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a cleaner shoreface or deltaic body with intact finer-grained enclosure.

Criteria for a producing reservoir

- Identify the basal flooding surface and distinguish sand continuity from amalgamation across erosion.

Evidence that weakens the idea

- Member rank and boundary usage vary; a convenient depth plane is not a surveyed McLaren surface.

Sources: S06, S03. Full references follow.

Colony Member: tidal-fluvial estuarine channels

Early Cretaceous, Albian | informal member | documented estuarine channel reservoir

Flynn documents a narrow, porous channel reservoir interpreted as tidal-fluvial estuarine fill, associated with a NW-SE structural trough [S08].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Pense. These are not substitute member tops.

Published observations

- The trough occurs in Mannville and Duperow mapping; channel geometry and sediment thickening support salt-dissolution influence [S08].

Local and regional orientation

The cited local trough trends northwest-southeast; this is not a regional Colony paleoshoreline.

Reservoir environments to investigate

- Test channel continuation, abandoned bends or discrete adjacent fills close to verified Colony pools, with lateral mud seal.

Criteria for a producing reservoir

- Map sand using locally calibrated GR/resistivity/porosity and core; separate net sand from oil-filled sand, and evaluate salt-loss timing.

Quantitative examples: source scope only

- value: channel width <1 km; meaning: Published local channel example; regional 2 km geometry cannot resolve its edges; source: S08; page: 1
- value: 37% core-average porosity; about 33% log-estimated in clean sand; meaning: Study-local clean-sand subset; not a regional pay cutoff or expected porosity; source: S08; page: 8

Well, core and log evidence

- uwi: 111/13-19-052-23W3; wellLicence: 81I066; evidence: Published type/reference log, Shell Husky Paradise Hill; source Figure 1 and cross-section ties. Full current inventory event must be reconciled before sample placement.; source: S08; page: 3,9
- uwi: 111/15-34-053-24W3/00; wellLicence: 13J108; evidence: Published oil-stained sandstone core photograph at 456 m; a historical source example, not a newly logged core.; source: S08; page: 7, Figure 5
- uwi: 131/11-13-053-24W3/00; wellLicence: 10E198; evidence: Published cross-bedded/faulted sandstone core photograph; no new reservoir-quality interpretation made here.; source: S08; page: 7, Figure 5

Area significance

Paradise Hill / Twp 52-53, Rge 23-24W3 study area.

Evidence that weakens the idea

- The source cutoffs are study-specific. A connected sand may water out; a trough may breach a seal or postdate filling.

Sources: S08, S03. Full references follow.

8. Lower Colorado: Spinney Hill, Viking and post-Viking marine sand

Viking pool geometry around Kindersley-Dodsland is strongly documented. Central Saskatchewan also contains real Spinney Hill and Viking sedimentary evidence, including published cores near Melfort. Those central rocks are not automatically charged equivalents of western pools.

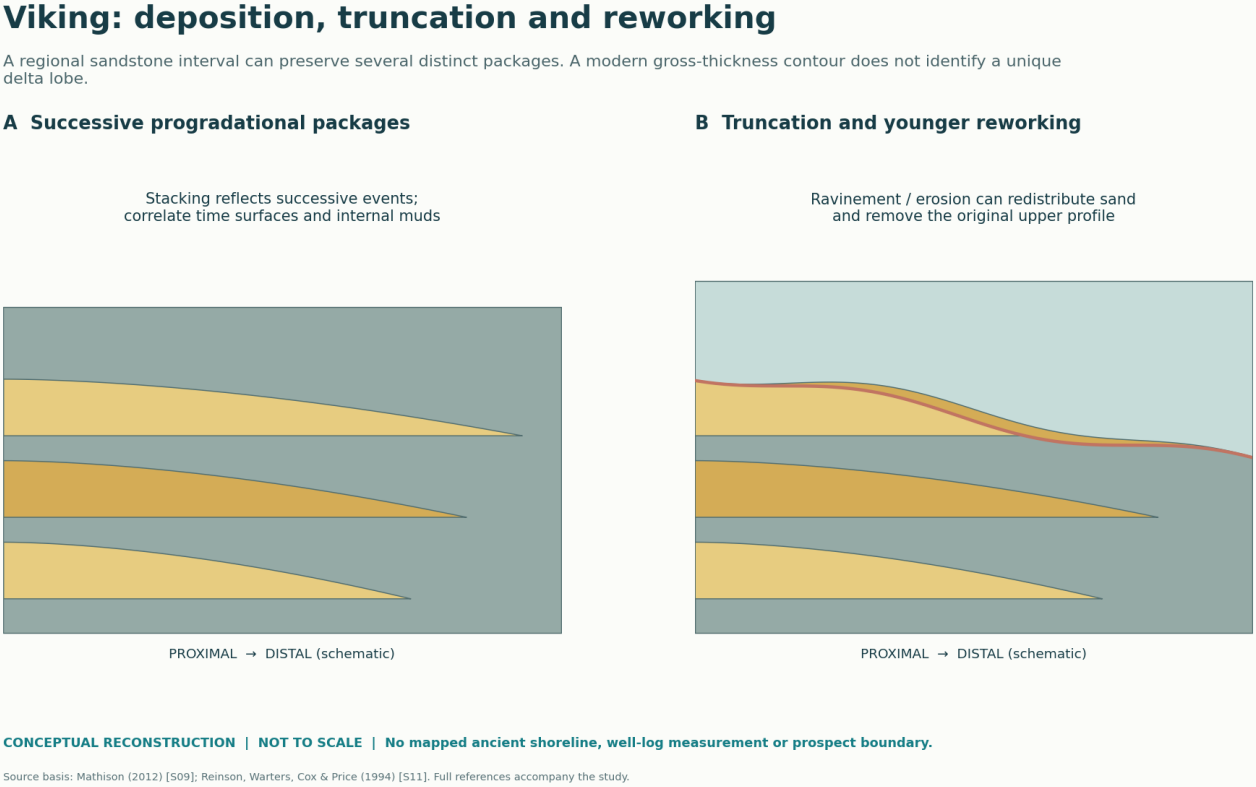


Figure 17. Original schematic showing competing depositional and preservation controls. Packages are illustrative and are not positioned beneath named pools. Proximal-distal direction is conceptual; no regional cardinal shoreline orientation or mapped lobe outline is assigned. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S09, S11.

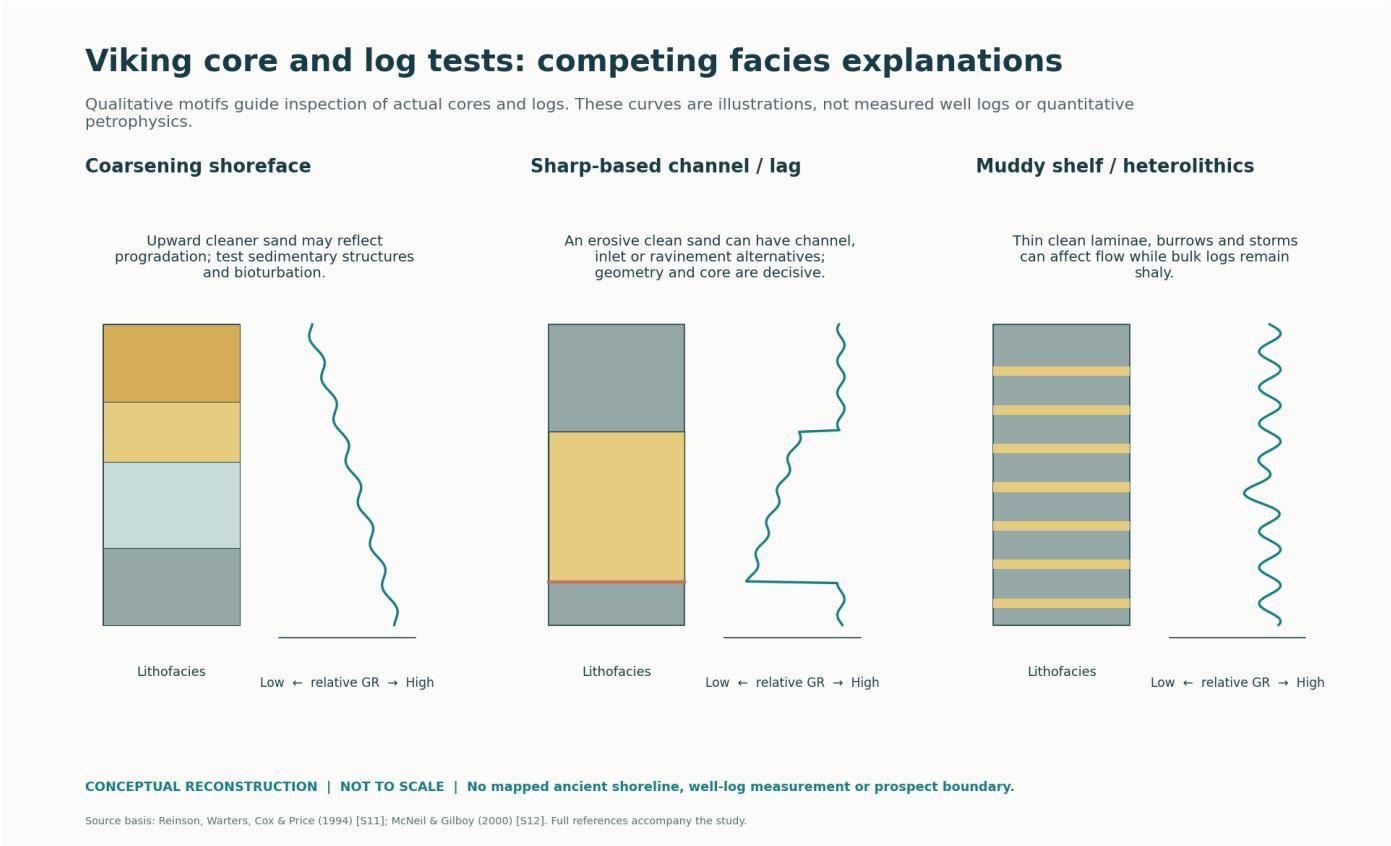


Figure 18. Schematic lithofacies columns and relative gamma-ray motifs. There are no measured depth scales, API values, net-pay cutoffs or source-well identities in this illustration. Similar log motifs can have different environmental explanations; core fabrics, stratigraphic position and cross-sections are needed. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S11, S12.

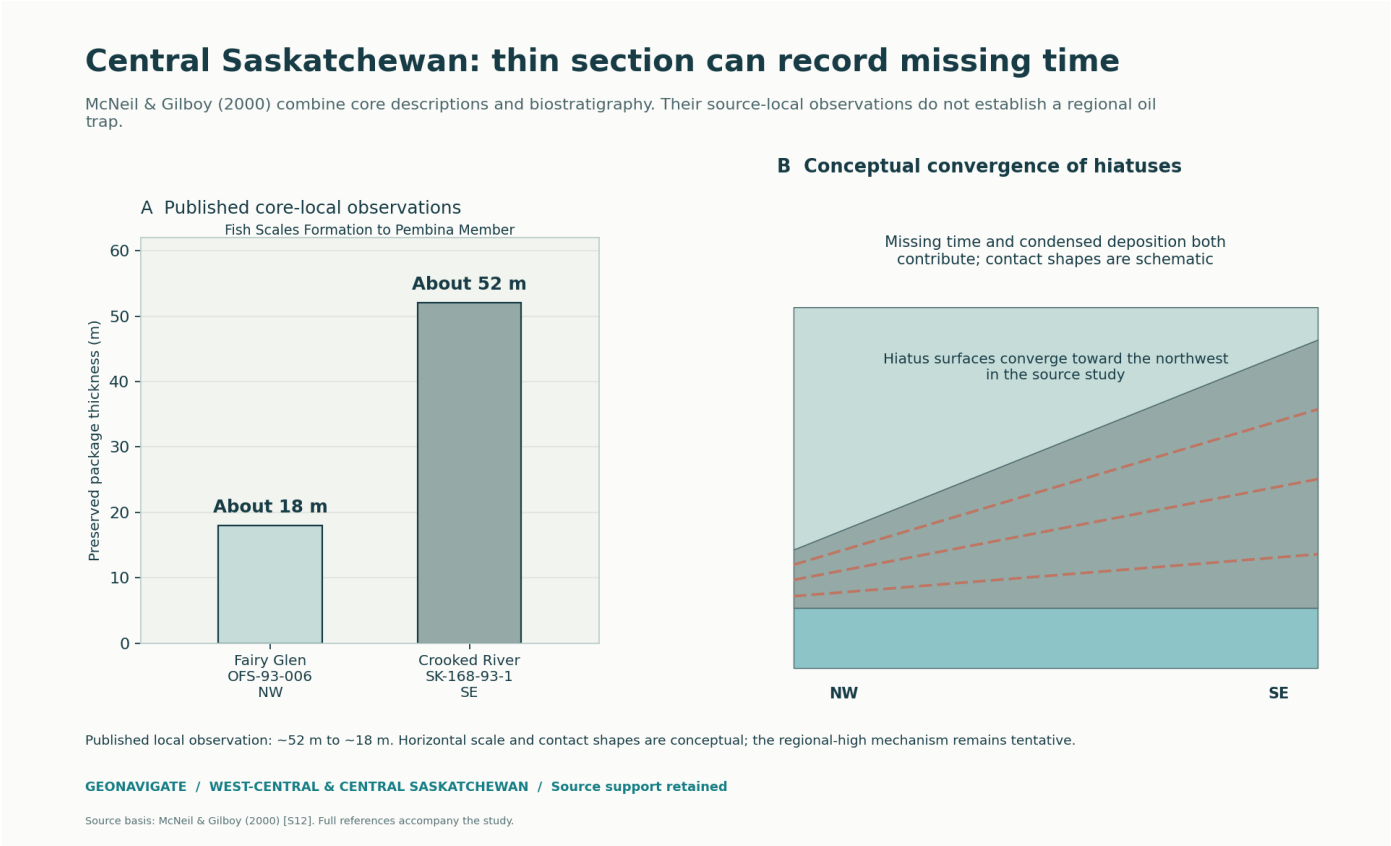


Figure 19. The Fish Scales-to-Pembina interval thins northwestward from about 52 m in the Crooked River core to about 18 m in Fairy Glen in McNeil & Gilboy (2000, p. 102). Bars show the published approximate local values; the section is an original conceptual explanation of combined hiatuses and condensation. It is not a mapped erosional surface, measured erosion depth or hydrocarbon trap. Evidence basis: Original explanatory drawing based on the named published sources; no copied source figure and no measured geometry except explicit source-local annotations. Sources: S12.

Spinney Hill sandstone

Early Cretaceous, Albian | member / formation in different schemes | documented sand / local gas-pool context

Glauconitic marine sand and shale were supplied from the cratonic side of the basin and interpreted as the marine portion of a deltaic-tidal system [S13].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Joli Fou. These are not substitute member tops.

Published observations

- Published central cores show storm-influenced and bioturbated shelf sand [S12]. The official inventory includes Cavalier Spinney Hill gas pool,228080 [S28].

Local and regional orientation

Regional sediment source from north/east in Edwards; exact local shoreline and sand-axis bearings require wells.

Reservoir environments to investigate

- Test cleaner marine sand tongues, reworked bars or sand-rich lobe margins beside a demonstrated same-zone accumulation.

Criteria for a producing reservoir

- Calibrate glauconite/cement effects on GR, porosity and resistivity; demonstrate net sand continuity, gas saturation and pressure.

Area significance

Cavalier gas-pool context and central shelf; Melfort-area cores provide depositional evidence, not oil discoveries.

Evidence that weakens the idea

- The Joli Fou regional mesh does not isolate Spinney Hill thickness. A central sandstone occurrence is not proof of an oil-bearing extension.

Sources: S13, S12, S28. Full references follow.

Joli Fou Formation

Early Cretaceous, Albian | formation | marine cap / correlation

Widespread marine flooding deposited mud above upper Mannville and local basal marine sand [L-joli-fou; S14].

Numerical layers: Joli Fou.

Published observations

- Joli Fou and Spinney Hill rank/placement varies among regional schemes.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Assess marine mud as cover above Mannville and as a datum for younger Viking architecture.

Criteria for a producing reservoir

- Identify sandy interruptions and the transgressive contact; test actual cap thickness.

Evidence that weakens the idea

- A named shale can contain permeable sand and local erosional breaks.

Sources: L-joli-fou, S14. Full references follow.

Viking Formation: Dodsland-Hoosier-Kindersley system

Early Cretaceous, late Albian | formation / composite regional model horizon | documented western oil/gas reservoir; conditional local extensions

The Dodsland technical interpretation proposes several deltaic packages truncated and reworked during marine flooding. Surviving delta-front and shelf-shoal sands can therefore overlap without forming one continuous shoreface [S09].

Numerical layers: Viking Newcastle Flotten Lake.

Published observations

- Historical Dodsland cores document a shaly fine sandstone reservoir [S10]. Official named pools include Dodsland 227327, Hoosier 227325, Coleville-Smiley 227324 and Kindersley 227347 [S28].

Local and regional orientation

Regional shelf framework is established; no exact Dodsland lobe or shoreline bearing is invented.

Reservoir environments to investigate

- Test lobe-edge or reworked-shoal continuations, trapped sand remnants and discrete stacked bodies adjacent to known same-interval pools.

Criteria for a producing reservoir

- Tie ravinement/erosional surfaces and cores to GR/resistivity/density; compare reservoir and nonreservoir beds, pressures, oil-water contacts and production.

Quantitative examples: source scope only

- value: 22.4% porosity;22.7 mD average horizontal permeability; meaning: Historical Report 85 text p. 4: averages from 18 cored wells using 10% porosity and 1 mD cutoffs. Its grouped Table 3 gives a different permeability mean; these are not modern regional values; source: S10; page: 4

Area significance

Kindersley-Dodsland-Hoosier-Coleville, with separate depositional episodes and fluids.

Evidence that weakens the idea

- Gross Viking thickness is not net pay. A pool boundary is administrative, while closely spaced laterals may conceal compartmentalization or depleted zones.

Sources: S09, S10, S11, S28. Full references follow.

Flotten Lake / Newcastle equivalents and central Viking facies

Early Cretaceous, Albian | regional equivalent names / facies | documentary equivalent facies

Northern and eastern sandstone equivalents are not identical bodies simply because they are grouped in the regional Viking-Newcastle-Flotten Lake mesh [S11; S14].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Viking Newcastle Flotten Lake. These are not substitute member tops.

Published observations

- The central core study records locally different marine and marginal-marine Viking facies [S12].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a locally identified sandstone body with independent gas/oil evidence.

Criteria for a producing reservoir

- Tie the local nomenclature and bounding markers; distinguish lateral facies transition from a real erosional gap.

Evidence that weakens the idea

- The composite surface supports regional orientation only; no independent Flotten Lake or Newcastle reservoir thickness is supplied.

Sources: S11, S14, S12. Full references follow.

Westgate marine shale

Late Albian; boundary usage varies | formation / member | seal / marine datum

Marine mud with subordinate sandy or silty beds overlies Viking equivalents [L-westgate].

Numerical layers: Westgate.

Published observations

- A transgressive contact above Viking provides a useful local datum in the central core study [S12].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Assess cover and pressure containment above Viking sand; investigate a local silt reservoir only with direct test evidence.

Criteria for a producing reservoir

- Identify flooding lag and younger truncation; do not correlate all mudstone solely by dark color.

Evidence that weakens the idea

- Shale source richness, maturity and fracture productivity require measurements.

Sources: L-westgate, S12. Full references follow.

Fish Scales marker interval

Albian-Cenomanian transition in regional usage | marker / formation | datum / condensed interval

Fish-rich, locally sandy and phosphatic marine beds form a distinctive correlation interval with condensed and erosional relationships [S14].

Numerical layers: Fish Scales.

Published observations

- In central cores this interval is affected by hiatuses and changing preservation [S12].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Use a consistently defined marker to constrain surrounding sand geometry.

Criteria for a producing reservoir

- Distinguish top versus base picks and preserve the source definition of the mapped surface.

Evidence that weakens the idea

- A thin highly radioactive marker is not automatically a rich, mature source or producible shale.

Sources: S14, S12. Full references follow.

Big River Formation

Late Albian-Cenomanian | regional formation | regional correlation container

This regional name groups the mainly muddy interval from Viking/Flotten Lake to Second White Specks, including Fish Scales and local St. Walburg sandstone [S14].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Westgate, Fish Scales, 2nd White Specks. These are not substitute member tops.

Published observations

- It overlaps finer formation/member schemes; it is not an extra bed to add on top of them.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Resolve actual sand and mud subdivisions before testing reservoir or seal.

Criteria for a producing reservoir

- Avoid double-counting gross thickness across alternative nomenclatures.

Evidence that weakens the idea

- No separate Big River mesh is supplied; its name does not define uniform hydraulic properties.

Sources: S14, L-colorado. Full references follow.

St. Walburg sandstone

Cretaceous, post-Viking Lower Colorado interval | sandstone unit | documented gas-zone context

A localized northern/eastern marine sandstone replaces part of the otherwise mud-rich succession [L-colorado; S14].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Westgate, Fish Scales. These are not substitute member tops.

Published observations

- Official gas pools include Tangleflags St Walburg 226418 and Reflex Lake N St Walburg 226419 [S28].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test sand-body continuations and local lateral sealing near verified same-zone gas wells.

Criteria for a producing reservoir

- Establish its actual position relative to Viking and Fish Scales, net sand, saturation and pressure.

Evidence that weakens the idea

- The regional Westgate/Fish Scales surfaces are not an independent St. Walburg reservoir plane.

Sources: L-colorado, S14, S28. Full references follow.

Belle Fourche marine shale

Late Cretaceous, Cenomanian | formation / member | marine cover / conditional local sand

Dark marine mud with bentonite and local thin sand/silt records shelf deposition [L-belle-fourche].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Fish Scales, 2nd White Specks. These are not substitute member tops.

Published observations

- Central preservation differs from the thick southern succession; local breaks occur in published core correlations [S12].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test local sandy beds only where sedimentology and actual gas/oil measurements support them; assess shale cap elsewhere.

Criteria for a producing reservoir

- Resolve contact erosion, bentonite markers and sand connectivity.

Evidence that weakens the idea

- The southwest Senate sandstone analogue is not an identified WCC reservoir without local evidence.

Sources: L-belle-fourche, S12. Full references follow.

Second White Specks Formation and Phillips sandstone context

Late Cretaceous, Cenomanian-Turonian | formation / internal sandstone name | potential cover / conditional local reservoir

Calcareous marine mud and local sand record a widespread marine phase; sandstone names and formation boundaries vary regionally [S14].

Numerical layers: 2nd White Specks.

Published observations

- Underlying hiatuses are documented in central Saskatchewan, so thin section can reflect missing time as well as low deposition [S12].

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a local sand or fractured mudrock only with explicit reservoir, saturation and flow evidence.

Criteria for a producing reservoir

- Separate the calcareous marker from a legacy “Second Specks sand” completion; identify the actual sandstone before assigning pool depth.

Evidence that weakens the idea

- A formation-top surface does not map Phillips net sand or a particular gas-bearing lens.

Sources: S14, S12. Full references follow.

9. Upper Colorado: marine mud, local sands and central condensation

A mud-dominated marine succession contains important lateral changes and breaks. Central potash/exploration cores establish stratigraphic thinning and hiatuses; they do not establish a new regional oil province. The numerical Upper Colorado interval is a container, not a resolved map of every sand.

See Figure 19 - Core-local thinning and conceptual hiatus convergence (earlier in this study).

See Figure 18 - Qualitative core/log discriminators for Viking facies (earlier in this study).

Carlile interval

Late Cretaceous, Turonian | formation / regional correlation context | marine background / conditional sand

Noncalcareous marine mud and local sand record regression between more calcareous marine phases [S14].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Upper Colorado. These are not substitute member tops.

Published observations

- Regional terminology varies toward eastern Saskatchewan and Manitoba.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate local shoreface/shelf sand only where penetrations and tests establish it.

Criteria for a producing reservoir

- Tie bounding white-speckled intervals and hiatuses; use core texture and fossils to distinguish sedimentary setting.

Evidence that weakens the idea

- No dedicated Carlile or individual sand mesh exists in this package.

Sources: S14, L-colorado. Full references follow.

Niobrara / First White Specks marine interval

Late Cretaceous | formation / equivalent regional interval | marine cover / possible source or local reservoir

Calcareous shale, chalky beds and subordinate noncalcareous sediment record marine deposition; the First White Specks thins across central Saskatchewan [L-first-white-specks].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Upper Colorado. These are not substitute member tops.

Published observations

- Biostratigraphic evidence is needed to distinguish reduced deposition from missing section.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test specific porous or naturally fractured intervals only if fluids and permeability are demonstrated.

Criteria for a producing reservoir

- Measure organic richness/maturity, brittleness and natural fractures independently of carbonate content.

Evidence that weakens the idea

- White specks and high resistivity are not sufficient to infer producible oil or gas.

Sources: L-first-white-specks, S14. Full references follow.

Medicine Hat sandstone context

Late Cretaceous | regional sandstone interval | external analogue / conditional equivalent

Fine sand and silt within marine mud provide a major shallow-gas analogue in the southwestern basin [S14].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Upper Colorado. These are not substitute member tops.

Published observations

- The established southern field is not in this WCC window; a name-based northward extension would need local stratigraphic proof.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Investigate only a local identified equivalent with gas saturation and measured permeability.

Criteria for a producing reservoir

- Demonstrate stratigraphic equivalence, cap continuity and gas origin; compare local wet tests.

Evidence that weakens the idea

- A southern shallow-gas analogue cannot establish WCC reserves or a blanket sand sheet.

Sources: S14. Full references follow.

Milk River-Alderson equivalent interval

Late Cretaceous | formation / regional equivalent | conditional marine-sand equivalent

Western coastal sand passes basinward into more marine muddy equivalents; the Virgelle sand component disappears laterally and equivalent strata may be placed within Lea Park [L-milk-river].

Numerical layers: Milk River.

Published observations

- The model retains source nomenclature rather than claiming every Milk River mesh cell contains the southern reservoir facies.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test local fine sand/silt or burrow-connected pores only where supported by local core and fluids.

Criteria for a producing reservoir

- Separate gross equivalent interval from actual net gas sand and verify the named cap.

Evidence that weakens the idea

- Facies change, low permeability, water and erosional loss may preclude a reservoir.

Sources: L-milk-river, S14. Full references follow.

Central Fish Scales-Pembina condensed and erosional succession

Cenomanian-earliest Campanian | documented sequence/preservation interval | direct core-based preservation evidence

McNeil and Gilboy document a package thinning northwestward from approximately 52 m at Crooked River to 18 m at Fairy Glen through combined condensation and hiatuses [S12].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Fish Scales, 2nd White Specks, Upper Colorado. These are not substitute member tops.

Published observations

- The source proposes a broader structural-high relationship toward Saskatoon but leaves the cause unresolved.

Local and regional orientation

Published core correlation thins northwestward toward Fairy Glen/Fort-à-la-Corne.

Reservoir environments to investigate

- Use the relationship to test preservation of specific reservoir and seal intervals, not to designate a dome-shaped oil prospect.

Criteria for a producing reservoir

- Integrate biostratigraphy and core contacts with seismic and regional isopachs. Distinguish uplift, sediment starvation, erosion and local volcanic effects.

Quantitative examples: source scope only

- value: approximately 52 m →18 m; meaning: Fish Scales-Pembina preserved package, Crooked River to Fairy Glen; source-core values, not net reservoir; source: S12; page: 102

Well, core and log evidence

- uwi: SK-168-93-1; evidence: Crooked River published research core. This is a research-hole identifier, not a parsed petroleum UWI.; source: S12; page: 99-102
- uwi: OFS-93-006; evidence: Fairy Glen published research core; source biostratigraphic/lithologic interpretation, no independent current-inventory location inferred.; source: S12; page: 99-102
- uwi: 1-09-01; evidence: Leather River published research core identifier; incomplete for petroleum UWI matching.; source: S12; page: 99-102

Area significance

Melfort-Fort-à-la-Corne fringe and comparison toward Saskatoon.

Evidence that weakens the idea

- This evidence is a conceptual regional reconstruction, not a surveyed continuous erosional surface. Thin shale may remove rather than improve a cap.

Sources: S12. Full references follow.

10. Later Cretaceous to Quaternary: retreating seas, remnants and glacial cover

Upper marine and continental units complete the regional history. Some occur only as remnant context, and the source model groups much of the youngest bedrock. The Horseshoe Canyon/Eastend age interval is far younger than the Viking and is not the name of the Kindersley-Dodsland oil reservoir.

See Figure 9 - Time-dependent basin and petroleum-system evolution (earlier in this study).

See Figure 6 - Published zero edges, erosion, thinning and model support (earlier in this study).

Lea Park Formation

Late Cretaceous | formation | marine cap / context

Marine shale and silt accumulated during a renewed transgression, with lateral and regional nomenclatural changes [L-lea-park; S26].

Numerical layers: Lea Park. Context surfaces only: Sub-Lea Park unconformity. These are not substitute member tops.

Published observations

- The regional source includes a separate sub-Lea Park unconformity; it is not interchangeable with the formation top.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Assess cover over older sands and test local marine sand only with direct evidence.

Criteria for a producing reservoir

- Resolve basal erosion, cap thickness, silt content and pressure behavior.

Evidence that weakens the idea

- A coarse marine-shale surface does not resolve every local sand or hiatus.

Sources: L-lea-park, S26. Full references follow.

Pierre Shale: Pembina, Millwood and Odanah context

Late Cretaceous, Campanian | formation with eastern members | documentary marine cover

Eastern marine shale nomenclature includes a condensed Pembina interval and younger Millwood/Odanah packages. These names help describe the central research cores [S12].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Upper Colorado, Lea Park. These are not substitute member tops.

Published observations

- Member-level continuity is a documentary correlation, not an independently modeled thickness.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Evaluate preservation and seal character; do not use a bentonitic or siliceous interval name as evidence of hydrocarbon pay.

Criteria for a producing reservoir

- Tie fossils, bentonites and local lithology to the chosen western/eastern nomenclature.

Evidence that weakens the idea

- Alternative names can overlap numerical Upper Colorado/Lea Park containers; avoid double-counting.

Sources: S12, S26. Full references follow.

Belly River / Judith River clastic wedge

Late Cretaceous, Campanian | regional formation / group usage | conditional sandstone / overburden

A retreating sea was replaced by marginal-marine, deltaic, river, floodplain and coal-forming settings, with diachronous contacts [S26; L-belly-river].

Numerical layers: Belly River.

Published observations

- The model retains Belly River as a regional label; rank and Judith River equivalence depend on location and source.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a retained channel or shoreface sand enclosed by mud where gas/oil evidence exists.

Criteria for a producing reservoir

- Separate marine shoreface from fluvial channel, identify coal and aquifer effects on logs, and establish seal and pressure.

Evidence that weakens the idea

- Coal and porous freshwater sand are not conventional oil evidence; younger erosion can remove containment.

Sources: S26, L-belly-river. Full references follow.

Bearpaw marine interval

Late Cretaceous | formation | documentary potential cover

Marine transgression interrupted the older continental/coastal wedge and deposited muddy cover where retained [S26].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Above Belly River. These are not substitute member tops.

Published observations

- No independent Bearpaw surface is supplied; the source groups younger bedrock above Belly River.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Assess a documented local marine cap above a retained older sand.

Criteria for a producing reservoir

- Verify actual presence and continuity rather than assuming an Alberta or southern Saskatchewan analogue.

Evidence that weakens the idea

- The regional above-Belly-River envelope cannot establish Bearpaw thickness.

Sources: S26. Full references follow.

Horseshoe Canyon / Eastend equivalent wedge

Latest Cretaceous | regional equivalent formations | documentary younger-wedge context

Later regression produced coastal to continental sand, mud and coal; Eastend is part of the eastern Saskatchewan correlation context [S26].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Above Belly River. These are not substitute member tops.

Published observations

- These units are much younger than Viking. No independent WCC reservoir surface is mapped for them.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Test a verified local retained sandstone only after establishing stratigraphy, cover and gas/oil occurrence.

Criteria for a producing reservoir

- Use the correct local formation name and preservation evidence; keep shallow groundwater separate from a petroleum target.

Evidence that weakens the idea

- A broad young-bedrock envelope does not establish a Horseshoe Canyon gas play in Kindersley or central Saskatchewan.

Sources: S26. Full references follow.

Whitemud Formation

Latest Cretaceous | formation / remnant context | documentary younger context

Kaolinitic weathered and reworked sediment records continental processes in the southern regional succession. [S26].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Above Belly River. These are not substitute member tops.

Local preservation

Presence is not asserted from the broad above-Belly-River model envelope.

Published observations

- Included for completeness of regional history; a separate supported WCC formation surface is not available.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No petroleum target is proposed solely from this documentary entry.

Criteria for a producing reservoir

- Confirm a local retained unit and its age before any reservoir evaluation.

Evidence that weakens the idea

- Southern outcrops and remnant basins do not establish occurrence throughout this northern window.

Sources: S26. Full references follow.

Battle Formation

Latest Cretaceous | formation / remnant context | documentary younger context

Mud-rich continental deposits and bounding breaks form a regional marker above the Whitemud context. [S26].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Above Belly River. These are not substitute member tops.

Local preservation

Presence is not asserted from the broad above-Belly-River model envelope.

Published observations

- Included for completeness of regional history; a separate supported WCC formation surface is not available.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No petroleum target is proposed solely from this documentary entry.

Criteria for a producing reservoir

- Confirm a local retained unit and its age before any reservoir evaluation.

Evidence that weakens the idea

- Southern outcrops and remnant basins do not establish occurrence throughout this northern window.

Sources: S26. Full references follow.

Frenchman Formation

Latest Cretaceous | formation / remnant context | documentary younger context

River-channel and floodplain deposits characterize the southern Saskatchewan terminal Cretaceous record. [S26].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Above Belly River. These are not substitute member tops.

Local preservation

Presence is not asserted from the broad above-Belly-River model envelope.

Published observations

- Included for completeness of regional history; a separate supported WCC formation surface is not available.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No petroleum target is proposed solely from this documentary entry.

Criteria for a producing reservoir

- Confirm a local retained unit and its age before any reservoir evaluation.

Evidence that weakens the idea

- Southern outcrops and remnant basins do not establish occurrence throughout this northern window.

Sources: S26. Full references follow.

Ravenscrag Formation

Paleocene | formation / remnant context | documentary younger context

Continental river, floodplain and coal-forming environments characterize the southern Paleocene record. [S26].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Above Belly River. These are not substitute member tops.

Local preservation

Presence is not asserted from the broad above-Belly-River model envelope.

Published observations

- Included for completeness of regional history; a separate supported WCC formation surface is not available.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No petroleum target is proposed solely from this documentary entry.

Criteria for a producing reservoir

- Confirm a local retained unit and its age before any reservoir evaluation.

Evidence that weakens the idea

- Southern outcrops and remnant basins do not establish occurrence throughout this northern window.

Sources: S26. Full references follow.

Swift Current Creek / Cypress Hills and younger remnant context

Paleogene-Neogene | formation / remnant context | documentary younger context

Younger continental gravel, sand and mud remnants document uplift, erosion and river deposition farther south. [S26].

Documentary entry: no independently resolved numerical layer for this named unit. Context surfaces only: Above Belly River. These are not substitute member tops.

Local preservation

Presence is not asserted from the broad above-Belly-River model envelope.

Published observations

- Included for completeness of regional history; a separate supported WCC formation surface is not available.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- No petroleum target is proposed solely from this documentary entry.

Criteria for a producing reservoir

- Confirm a local retained unit and its age before any reservoir evaluation.

Evidence that weakens the idea

- Southern outcrops and remnant basins do not establish occurrence throughout this northern window.

Sources: S26. Full references follow.

Quaternary cover and buried valleys

Quaternary | surficial deposits | cover / erosional context

Glacial till, outwash, lake sediment and river deposits cover an erosional bedrock surface. Buried valleys may cross older stratigraphy [S29].

Numerical layers: Quaternary. Context surfaces only: Sub-Quaternary unconformity. These are not substitute member tops.

Published observations

- The coarse regional sub-Quaternary surface is unsuitable for local aquifer, geotechnical or shallow-depth design.

Local and regional orientation

No local shoreline bearing is inferred from a formation name, modern dip, a pool outline or well alignment alone.

Reservoir environments to investigate

- Use as cover and erosion context for deeper stratigraphic preservation.

Criteria for a producing reservoir

- Use appropriate local surficial and water-well data for shallow questions; keep terrain elevation and bedrock depth datums explicit.

Evidence that weakens the idea

- Shallow gas shows, organic deposits and water-bearing sand do not establish a conventional hydrocarbon pool.

Sources: S29, S01. Full references follow.

Local reservoir settings and falsifiable tests

The following settings combine documented observations with conditional hypotheses. Proximity to a pool does not establish common reservoir facies, pressure connectivity, seal quality or charge. Each setting states the observations needed to support or reject it.

1. Dodsland-Hoosier Viking: separate lobes and reworked sand

Area

West-central

Intervals

- Viking

Official pool-code examples

- 227327
- 227322
- 227325

Documented evidence

- Official pools include Dodsland, Dodsland North and Hoosier Viking [S28]. Historical core data and a published depositional interpretation exist [S09; S10].

Interpretation

Published local interpretation: superposed shallow-shelf delta packages were partly truncated and reworked. Sandstone bodies at similar depth may belong to different episodes.

Local setting to test

An adjacent untested body could occupy a preserved distal lobe, reworked shoal or sand remnant, provided it has effective pores, containment and charge.

Required conditions

- Tie each sand to the same bounding surfaces as the nearby pool.
- Require a closing permeability or structural boundary and retained cap.
- Account for pressure depletion and modern completion effects before comparing wells.

Decisive observations

- Core-calibrate GR, density and resistivity; map net connected sand rather than total Viking.

- Build cross-pool and along-body sections including wet and unsuccessful wells.
- Compare fluids, pressure gradients and production by actual completion zone.

Negative evidence

- A continuous gross Viking interval is not a continuous reservoir.
- A nearby producing lateral neither proves untested oil nor delineates the pool edge.

Confidence and limits

High confidence in a producing regional system; moderate in the cited local facies model; untested extensions are hypotheses.

Sources: S09, S10, S11, S28

2. Kindersley-Coleville-Smiley Viking: facies and retention checks

Area

West-central

Intervals

- Viking

Official pool-code examples

- 227347
- 227353
- 227324
- 227340

Documented evidence

- Kindersley, Kindersley South, Coleville-Smiley and Plato North Viking are official pool names in the clip [S28].

Interpretation

Regional Viking deposition permits shoreface, shelf-reworked and erosion-related sand architectures; the Dodsland facies model is an analogue to test, not an automatic assignment.

Local setting to test

Separate retained lobes or shoals could continue beside known pools, while stratigraphic thinning or cement may close them laterally.

Required conditions

- Confirm that a candidate belongs to the same sandstone episode.
- Demonstrate reservoir quality, sealing direction and mobile hydrocarbons.

Decisive observations

- Compare core sedimentary structures, grain size and cement along a transect.
- Resolve zero-edge, facies-change and non-producing-offset evidence separately.

Negative evidence

- A NW-SE pool alignment does not uniquely identify a shoreline.
- Southern Forgan/Elrose/Plato analogues must remain outside-window context where beyond 51.25°N.

Confidence and limits

High confidence in official pools; local environment and extensions require member-scale evidence.

Sources: S11, S09, S28

3. Coleville-Hoosier-Cactus Lake-Buffalo Coulee western Bakken

Area

West-central

Intervals

- Bakken middle sandstone
- Bakken shale
- sub-Cantuar unconformity

Official pool-code examples

- 441421
- 441424
- 441422
- 441326
- 100027

Documented evidence

- Official pool names include Coleville, Hoosier, Buffalo Coulee, Cactus Lk Basman-Bakken and Dodsland West Bakken [S28].
- Published core research identifies conventional heavy-oil sand associated with tidal/marginal-marine deposition [S30; S31].

Interpretation

Western middle Bakken reservoir sand and its later sub-Cantuar truncation define a different practical reservoir setting from the southeast tight-oil analogue.

Local setting to test

A preserved sand body may continue into a sealed remnant near existing pools; younger valley incision may create a lateral juxtaposition or remove the cap.

Required conditions

- Prove remaining middle sandstone and its upper/lateral seal.
- Check whether a mixed Basman-Bakken zone crosses the unconformity.
- Determine oil-water contacts and hydraulic communication with Mannville.

Decisive observations

- Construct a subcrop map from actual well tops and core.
- Separate original depositional thickness from erosional removal.
- Use oil geochemistry, pressures and wet tests to assess charge and leakage.

Negative evidence

- An erosional edge can expose a reservoir to water or strip it away.
- Published high porosity/permeability is local, and not evidence of undeveloped oil everywhere.

Confidence and limits

High confidence in a conventional western Bakken petroleum system; moderate in generalized facies/preservation interpretation; new extensions remain conditional.

Sources: S30, S31, S28, S18

4. Winter-Unity lower Mannville valleys

Area

West-central

Intervals

- Dina
- Cummings
- Lloydminster cap

Official pool-code examples

- 235007
- 235008

Documented evidence

- Winter Cummings and Winter South Cummings are official oil pools [S28].
- Bauer and colleagues interpreted core and wireline data in the Winter study [S05].

Interpretation

Inherited basal relief and a later Cummings incised valley generated two separate architectural controls within a fluvial-to-brackish succession.

Local setting to test

Adjacent sand may occur along an established valley or in a separately filled branch, while muddy embayment deposits can provide lateral confinement.

Required conditions

- Tie the younger incision independently of the basal unconformity.
- Demonstrate sand rather than muddy valley fill.
- Establish later sealing and fluid communication.

Decisive observations

- Review core for tidal heterolithics, brackish traces and erosional contacts.
- Map net sand along and across the inferred valley and include dry/wet offsets.

Negative evidence

- A paleovalley axis can be water-bearing.
- The drill pattern is a development response and is not independent evidence for the original channel.

Confidence and limits

High confidence in the published Winter depositional example; adjacent geometry is unproven until correlated.

Sources: S05, S03, S28

5. Lloydminster Sparky-Waseca coastal and incised-valley systems

Area

West-central

Intervals

- Sparky
- Lower Waseca
- Upper Waseca

Official pool-code examples

- 232101
- 232103
- 232105
- 231331

Documented evidence

- Many official Sparky and Waseca pools occur within the study window [S28].
- Published core/ichnology studies distinguish storm shoreface, mixed delta, channels, bay and coastal-plain facies [S06; S07].

Interpretation

Adjacent facies along a coastline differ; younger Waseca incision modifies the underlying sand geometry and sealing relationships.

Local setting to test

A cleaner shoreface sector, delta-front body or separate estuarine fill may occur near a known pool, but each requires independent sand and containment mapping.

Required conditions

- Identify a specific member and sequence position.
- Separate lower coastal sand from upper valley-fill reservoir.
- Establish mud-baffle continuity and post-incision seal integrity.

Decisive observations

- Use core and trace assemblages to test salinity/wave/river influence.
- Correlate across rooted interfluves and valley axes.
- Compare multi-zone pressures and water chemistry.

Negative evidence

- Internal Waseca erosion is not resolved by Cantuar/Pense surfaces.
- A deltaic label does not imply uniformly high permeability.

Confidence and limits

High confidence in producing zone names and published facies diversity; no resolved member surfaces or new prospect geometry.

Sources: S06, S07, S03, S28

6. Paradise Hill and adjacent Colony channel settings

Area

West-central

Intervals

- Colony
- Pense regional context
- Prairie Evaporite influence

Official pool-code examples

- 231117
- 231110
- 100000

Documented evidence

- Paradise Hill Colony, Lloydminster Colony and Greenstreet Colony Sand are official pool names [S28].
- Flynn mapped a local channel and a trough shared by Duperow and Mannville surfaces [S08].

Interpretation

The published study links channel distribution and accommodation to salt-dissolution-related structure, with both structural and stratigraphic trapping.

Local setting to test

A separate channel or preserved bend near the mapped system could host reservoir sand if it was charged and enclosed by finer sediment.

Required conditions

- Show that accommodation or relief existed during filling.
- Confirm a sand body and lateral mud seal rather than extrapolating a trough.
- Test whether later collapse compromised the cap.

Decisive observations

- Tie source reference logs to new offset logs before applying cutoffs.
- Compare Prairie thickness, Duperow structure and progressively younger isopachs.
- Use core, pressure and fluid contacts to distinguish connected and isolated channels.

Negative evidence

- A<1 km channel cannot be mapped faithfully by a 2 km regional grid.
- A salt-related low may remain uncharged or may be hydraulically open.

Confidence and limits

High confidence in the cited local reservoir example; salt causality and channel extension remain location-specific.

Sources: S08, S15, S28

7. Loverna-Coleville South-Milton South Success remnants

Area

West-central

Intervals

- Success
- sub-Cantuar fill

Official pool-code examples

- 240024
- 240025
- 240026

Documented evidence

- The official inventory contains Loverna Success, Coleville S Success and Milton South Success oil pools [S28].
- Regional Success research documents discontinuous preserved sandstone remnants [S03].

Interpretation

An older sandstone can survive beneath or beside younger Mannville fill; regional nomenclature alone does not resolve the productive subunit.

Local setting to test

A retained sand remnant may provide a stratigraphic trap where younger fine fill encloses it and charge reached it before later alteration.

Required conditions

- Verify the zone assignment and both bounding surfaces.
- Prove pore quality through clay/cemented intervals.
- Demonstrate mud enclosure and fluid closure.

Decisive observations

- Correlate S1/S2 only where warranted by local core/age data.
- Include wells on remnant highs and surrounding valleys.

Negative evidence

- A sandstone mesa may be unsealed or tightly kaolin-cemented.
- Historical “Mannville sand” names may mask reassignment to Success.

Confidence and limits

High confidence in named pools; local remnant geometry and depositional facies require additional correlation.

Sources: S03, S25, S28

8. Cavalier Spinney Hill and Tangleflags-Reflex Lake St. Walburg gas

Area

Western/central comparison

Intervals

- Spinney Hill
- St. Walburg

Official pool-code examples

- 228080
- 226418
- 226419

Documented evidence

- These three official features are gas pools, not oil pools [S28].
- Primary studies identify marine sand within otherwise muddy Lower Colorado strata [S13; S14].

Interpretation

Localized sand tongues or sheets may be enclosed by marine mud; equivalent name and gross thickness do not establish continuity between the named pools.

Local setting to test

A cleaner, sealed adjacent sand body could hold gas if fluid evidence confirms it; central farther-east equivalents remain separate hypotheses.

Required conditions

- Tie the correct sandstone rather than its bounding regional marker.
- Confirm gas saturation, pressure and effective permeability.

Decisive observations

- Core-calibrate glauconite and clay effects.
- Map sand pinchout and pressure closure, including unsuccessful offsets.

Negative evidence

- Gas-pool evidence cannot be converted to an oil-fairway claim.
- No independent Spinney Hill or St. Walburg 3D top is supplied.

Confidence and limits

High confidence in official gas designations; conditional facies-extension hypotheses.

Sources: S13, S14, S28

9. Saskatoon-Humboldt-Watrous-Wynyard carbonate and salt framework

Area

Central geological comparison across both index windows

Intervals

- Winnipegosis
- Dawson Bay
- Souris River
- Duperow

Documented evidence

- Published regional framework and Saskatoon evaporite research establish carbonate-evaporite deposition and subsequent preservation issues [S15; S17].

Interpretation

Carbonate banks, shoals and secondary porosity are plausible geological features; salt loss may modify later geometry. These observations do not establish local charge.

Local setting to test

A carbonate target is conceivable only where a real porous body, adequate seal, trap timing and an independently supported petroleum migration/source system coincide.

Required conditions

- First demonstrate hydrocarbon occurrence and a viable charge route.
- Require core/seismic evidence for buildup or shoal geometry.
- Separate salt-collapse relief from depositional relief.

Decisive observations

- Screen deep core for pore fabric, stains and contamination.
- Acquire TOC/maturity or produced-oil geochemistry where applicable.
- Use formation-water pressures and salinity to test leakage and regional aquifer communication.

Negative evidence

- No new central oil pool is claimed from the current synthesis.
- Potash, porosity, a dome or a well alignment does not establish oil.
- Sparse deep petroleum tests weaken negative and positive inference.

Confidence and limits

Moderate-high for regional depositional framework; low for a new oil accumulation until charge and trap evidence exists.

Sources: S15, S16, S17, S18

10. Melfort-Fort-à-la-Corne and Saskatoon marine-sand / preservation comparison

Area

Central and northeastern fringe

Intervals

- Spinney Hill
- Viking
- Fish Scales-Pembina

Documented evidence

- Published research cores describe marine and marginal-marine strata and a northwest-thinning, hiatus-rich upper package [S12].

Interpretation

Sand bodies coexist with major preservation changes; some apparent thinning represents missing time and not a simple depositional sand pinchout.

Local setting to test

A local sand could be reservoir rock, but a hydrocarbon prospect requires separate charge, fluid and containment evidence before any area can be delineated.

Required conditions

- Demonstrate a sand body with connected pores.
- Identify which seals survive the mapped hiatuses.
- Require hydrocarbon observations or a credible geochemical migration model.

Decisive observations

- Tie research cores to petroleum wells using fossils, bentonites and calibrated logs.
- Map each hiatus separately if data allow; do not fabricate an erosional plane from a conceptual section.

Negative evidence

- Kimberlite-related core evidence is not petroleum production evidence.
- The proposed regional high mechanism remains uncertain.
- A thin section may lack its reservoir or cap.

Confidence and limits

High confidence in source-described core observations; moderate in regional reconstruction; low in untested hydrocarbon prospectivity.

Sources: S12, S13, S18

Complete pool catalogue and placement basis

Every official pool feature retained in the study window is listed below. The same pool code links the PDF, polygon export and interactive viewer. The designation is preserved separately from the numerical model interval. In particular, named Lloydminster-area members without independent released surfaces remain on a reference plane. A surface placement is a supported regional reference, not a newly measured reservoir elevation.

Area is the polygon area clipped to this study window, in hectares. It is not productive acreage, remaining resource area or an ownership/land-availability statement. Placement classes are generated from the model support audit. Source: Saskatchewan official pool and completion services [S28]; exact source URLs and dates accompany the data export.

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
232501	ABERFELDY G P	General Petroleum	Reference plane	11,453.4
232162	ABERFELDY SOUTH SPARKY	Sparky	Reference plane	11,244.0
239022	ALSASK BASAL MANNVILLE	Mannville / basal Mannville	Reference plane	510.4
227331	Avon Hill Viking Sand	Viking	Supported surface	17,421.8
232135	BALDWINTON SPARKY	Sparky	Reference plane	5,545.1
232522	BIG GULLY EAST GP	General Petroleum	Reference plane	3,933.1
234145	BIG GULLY EAST LLOYD	Lloydminster	Reference plane	3,933.1
230921	BIG GULLY EAST MANNVILLE	Mannville commingled members	Reference plane	3,933.1
231224	BIG GULLY EAST MCLAREN	McLaren	Reference plane	3,933.1
232120	BIG GULLY EAST SPARKY	Sparky	Reference plane	3,933.1
231346	BIG GULLY EAST WASECA	Waseca	Reference plane	3,933.1
230924	BIG GULLY MANNVILLE	Mannville commingled members	Reference plane	4,261.5
231202	BIG GULLY MCLAREN	McLaren	Reference plane	4,261.5
234120	BIG GULLY N LLOYD	Lloydminster	Reference plane	1,826.2
231221	BIG GULLY N MCLAREN	McLaren	Reference plane	1,826.2
232153	BIG GULLY N SPARKY	Sparky	Reference plane	1,826.2
232154	BIG GULLY SPARKY	Sparky	Reference plane	4,261.5
231309	BIG GULLY WASECA	Waseca	Reference plane	4,261.5
231116	BOLNEY COLONY-MCLAREN	Colony-McLaren	Reference plane	181.0
227332	BROCK EAST VIKING	Viking	Supported surface	4,931.6

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
227329	BROCK VIKING	Viking	Supported surface	8,311.4
441422	BUFFALO COULEE BAKKEN	Bakken	Supported surface	1,561.2
441428	BUFFALO COULEE N BAKKEN	Bakken	Surface + reference	1,883.8
234133	BUZZARD LLOYDMINSTER	Lloydminster	Reference plane	2,603.1
232521	BUZZARD N GP	General Petroleum	Reference plane	781.3
234144	BUZZARD N LLOYDMINSTER	Lloydminster	Reference plane	781.3
230915	BUZZARD N MANNVILLE	Mannville commingled members	Reference plane	781.3
232149	BUZZARD N SPARKY	Sparky	Reference plane	781.3
231335	BUZZARD N WASECA	Waseca	Reference plane	781.3
441446	CACTUS LAKE EAST BAKKEN	Bakken	Surface + reference	649.4
441326	CACTUS LK BASMAN-BAKKEN	Basal Mannville-Bakken	Surface + reference	7,194.6
231211	CACTUS LK N MCLAREN	McLaren	Reference plane	2,715.4
231106	CARRUTHERS COLONY	Colony	Reference plane	1,820.3
235016	CARRUTHERS CUMMINGS	Cummings	Reference plane	4,857.4
228080	CAVALIER SPINNEY HILL	Spinney Hill	Reference plane	2,078.8
100019	CELTIC CENTRAL MCLAREN	McLaren	Reference plane	14,523.2
231151	CELTIC COLONY GAS	Colony	Reference plane	3,378.9
232511	CELTIC G.P.	General Petroleum	Reference plane	14,711.4
230903	CELTIC MANNVILLE	Mannville commingled members	Reference plane	14,711.4
232122	CELTIC SPARKY	Sparky	Reference plane	14,711.4
231313	CELTIC WASECA	Waseca	Reference plane	14,711.4
441421	COLEVILLE BAKKEN	Bakken	Surface + reference	4,734.8
230026	COLEVILLE MANNVILLE	Mannville / basal Mannville	Reference plane	4,734.8
230027	COLEVILLE S MANNVILLE	Mannville / basal Mannville	Reference plane	3,613.8
240025	COLEVILLE S SUCCESS	Success	Supported surface	3,613.8
441429	COLEVILLE SOUTH BAKKEN	Bakken	Supported surface	3,613.8

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
441441	COLEVILLE W BAKKEN	Bakken	Surface + reference	650.9
227324	COLEVILLE-SMILEY VIKING	Viking	Supported surface	21,610.1
234122	COSINE LK LLOYDMINSTER	Lloydminster	Reference plane	3,059.7
441431	COURT BAKKEN	Bakken	Surface + reference	2,269.7
230038	COURT EAST MANNVILLE	Mannville / basal Mannville	Reference plane	485.8
441444	COURT NORTH BAKKEN	Bakken	Surface + reference	648.6
441438	COURT SOUTH BAKKEN	Bakken	Surface + reference	777.6
441451	COURT WEST BAKKEN	Bakken	Surface + reference	256.9
239011	CUTHBERT BASAL MANNVILLE	Mannville / basal Mannville	Reference plane	1,451.0
239026	CUTHBERT S BASAL MANN	Mannville / basal Mannville	Reference plane	198.0
230909	DEE VALLEY E MANNVILLE	Mannville commingled members	Reference plane	3,822.9
232125	DEE VALLEY EAST SPARKY	Sparky	Reference plane	3,822.9
231316	DEE VALLEY EAST WASECA	Waseca	Reference plane	3,822.9
230928	DEE VALLEY MANNVILLE	Mannville commingled members	Reference plane	5,509.3
231337	DEE VALLEY SOUTH WASECA	Waseca	Reference plane	64.7
232163	DEE VALLEY SPARKY	Sparky	Reference plane	5,509.3
231310	DEE VALLEY WASECA	Waseca	Reference plane	5,509.3
227322	DODSLAND NORTH VIKING	Viking	Supported surface	59,532.4
227327	DODSLAND VIKING	Viking	Supported surface	63,208.3
100027	DODSLAND WEST BAKKEN	Bakken	Supported surface	309.0
231108	DRAKE LAKE COLONY	Colony	Reference plane	4,922.1
441434	DRIVER BAKKEN	Bakken	Supported surface	2,342.3
230028	DRIVER MANNVILLE	Mannville / basal Mannville	Reference plane	2,342.3
230025	DRUID MANNVILLE	Mannville / basal Mannville	Reference plane	1,293.9

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
232518	DULWICH E GP	General Petroleum	Reference plane	389.5
233116	DULWICH E REX	Rex	Reference plane	389.5
232147	DULWICH E SPARKY	Sparky	Reference plane	389.5
232502	DULWICH GP	General Petroleum	Reference plane	129.5
232109	DULWICH NORTH SPARKY	Sparky	Reference plane	453.5
232102	DULWICH SPARKY	Sparky	Reference plane	2,723.6
231324	EAR LAKE WASECA	Waseca	Reference plane	388.0
234146	EDAM EAST LLOYDMINSTER	Lloydminster	Reference plane	943.8
234143	EDAM NORTH LLOYDMINSTER	Lloydminster	Reference plane	3,370.2
232133	EDAM NORTH SPARKY	Sparky	Reference plane	3,370.2
231326	EDAM NORTH WASECA	Waseca	Reference plane	3,370.2
232524	EDAM SOUTH GP	General Petroleum	Reference plane	1,685.5
230904	EDAM W MANNVILLE	Mannville commingled members	Reference plane	7,070.7
231320	EDAM WASECA	Waseca	Reference plane	6,285.9
232141	EDAM WEST SPARKY/G.P.	Sparky-General Petroleum	Reference plane	7,070.7
231323	EDAM WEST WASECA	Waseca	Reference plane	7,070.7
232158	EPPING EAST SPARKY	Sparky	Reference plane	517.1
232504	EPPING G.P.	General Petroleum	Reference plane	11,030.3
230913	EPPING MANNVILLE	Mannville commingled members	Reference plane	11,030.3
235005	EPPING NORTH CUMMINGS	Cummings	Reference plane	271.5
232503	EPPING NORTH GP	General Petroleum	Reference plane	271.5
231218	EPPING NORTH MCLAREN	McLaren	Reference plane	271.5
232151	EPPING NORTH SPARKY	Sparky	Reference plane	271.5
232110	EPPING S SPARKY	Sparky	Reference plane	3,432.3
232104	EPPING SPARKY	Sparky	Reference plane	11,030.3
230032	ERMINE MANNVILLE	Mannville / basal Mannville	Reference plane	389.6

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
227323	EUREKA VIKING	Viking	Supported surface	6,526.5
230916	EVESHAM NORTH MANNVILLE	Mannville commingled members	Reference plane	1,136.4
231208	EVESHAM NORTH MCLAREN	McLaren	Reference plane	1,136.4
232145	EVESHAM NORTH SPARKY	Sparky	Reference plane	1,136.4
100034	Evesham S Cummings-Dina	Cummings-Dina	Reference plane	521.2
232142	EVESHAM SPARKY	Sparky	Reference plane	1,820.1
235910	EYEHILL CUMMINGS/DINA	Cummings-Dina	Reference plane	1,751.0
235004	EYEHILL N CUMMINGS	Cummings	Reference plane	351.3
232132	EYEHILL N SPARKY	Sparky	Reference plane	351.3
232155	EYEHILL SPARKY	Sparky	Reference plane	649.4
230902	FOREST BANK MANNVILLE	Mannville commingled members	Reference plane	4,988.2
232123	FOREST BANK SPARKY	Sparky	Reference plane	4,988.2
231305	FOREST BANK WASECA	Waseca	Reference plane	4,988.2
230914	FREEMONT MANNVILLE	Mannville commingled members	Reference plane	2,399.6
231115	FREEMONT SOUTH COLONY	Colony	Reference plane	259.8
232130	FREEMONT SPARKY	Sparky	Reference plane	2,399.6
231315	FREEMONT WASECA	Waseca	Reference plane	2,399.6
232118	FREEMONT WEST SPARKY	Sparky	Reference plane	1,289.7
232113	FURNESS SPARKY	Sparky	Reference plane	1,360.5
441425	FUSILIER BAKKEN	Bakken	Surface + reference	2,860.7
441447	FUSILIER NORTH BAKKEN	Bakken	Surface + reference	583.7
227320	GLIDDEN VIKING	Viking	Supported surface	1,043.3
230906	GOLDEN LAKE N MANNVILLE	Mannville commingled members	Reference plane	3,048.5
230908	GOLDEN LAKE S MANNVILLE	Mannville commingled members	Reference plane	4,610.6
232112	GOLDEN LK N SPARKY	Sparky	Reference plane	3,048.5

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
231306	GOLDEN LK N WASECA	Waseca	Reference plane	3,048.5
232107	GOLDEN LK S SPARKY	Sparky	Reference plane	4,610.6
231308	GOLDEN LK S WASECA	Waseca	Reference plane	4,610.6
227334	GREENAN VIKING	Viking	Surface + reference	664.7
100000	Greenstreet Colony Sand	Colony	Reference plane	387.3
231307	GULLY LAKE WASECA	Waseca	Reference plane	4,398.9
231135	HALLAM COLONY	Colony	Reference plane	2,069.8
231137	HALLAM NORTH COLONY	Colony	Reference plane	1,301.9
231330	HALLAM WASECA	Waseca	Reference plane	2,069.8
441430	HEARTS HILL BAKKEN	Bakken	Surface + reference	1,556.4
100044	HEARTS HILL NORTH MANN	Mannville / basal Mannville	Reference plane	1,818.2
100042	HEARTS HILL WEST BAKKEN	Bakken	Surface + reference	650.2
231132	HILLMOND COLONY	Colony	Reference plane	3,373.3
232515	HILLMOND GP	General Petroleum	Reference plane	1,623.4
234125	HILLMOND LLOYD GAS	Lloydminster	Reference plane	3,373.3
232127	HILLMOND SOUTH SPARKY	Sparky	Reference plane	259.7
232115	HILLMOND SPARKY	Sparky	Reference plane	1,623.4
441424	HOOSIER BAKKEN	Bakken	Surface + reference	7,617.9
441452	HOOSIER E BAKKEN	Bakken	Supported surface	391.0
227356	HOOSIER N VIKING	Viking	Surface + reference	12,064.7
441448	HOOSIER S BAKKEN	Bakken	Surface + reference	3,331.2
227325	HOOSIER VIKING	Viking	Surface + reference	16,643.2
100040	KELFIELD MANNVILLE	Mannville / basal Mannville	Reference plane	1,226.9
230012	KERROBERT MANNVILLE	Mannville / basal Mannville	Reference plane	1,604.9
227342	KERROBERT VIKING	Viking	Supported surface	39,900.7
227353	KINDERSLEY SOUTH VIKING	Viking	Supported surface	1,039.7

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
227347	KINDERSLEY VIKING	Viking	Supported surface	2,856.8
231201	LANDROSE MCLAREN	McLaren	Reference plane	1,231.0
231301	LANDROSE WASECA	Waseca	Reference plane	1,231.0
239027	LAPORTE BASAL MANNVILLE	Mannville / basal Mannville	Reference plane	1,045.8
231339	LASHBURN EAST WASECA	Waseca	Reference plane	5,637.2
230919	LASHBURN MANNVILLE	Mannville commingled members	Reference plane	3,826.2
231220	LASHBURN MCLAREN	McLaren	Reference plane	3,826.2
231213	LASHBURN MCLAREN GAS	McLaren	Reference plane	519.1
100030	Lashburn North Rex	Rex	Reference plane	967.0
231153	LASHBURN NW COLONY GAS	Colony	Reference plane	9,358.5
231154	LASHBURN S CT COLONY GAS	Colony	Reference plane	1,816.8
230918	LASHBURN SOUTH MANNVILLE	Mannville commingled members	Reference plane	2,014.3
231223	LASHBURN SOUTH MCLAREN	McLaren	Reference plane	2,014.3
232129	LASHBURN SOUTH SPARKY	Sparky	Reference plane	2,014.3
231314	LASHBURN SOUTH WASECA	Waseca	Reference plane	2,014.3
232116	LASHBURN SPARKY	Sparky	Reference plane	3,826.2
232137	LASHBURN WEST SPARKY	Sparky	Reference plane	12,983.3
231113	LLOYD N COLONY	Colony	Reference plane	223.1
231110	LLOYDMINSTER COLONY	Colony	Reference plane	965.0
231119	LLOYDMINSTER SOUTH COLONY	Colony	Reference plane	223.3
232124	LLOYDMINSTER SPARKY	Sparky	Reference plane	528.5
100012	Lone Rock East Sparky	Sparky	Reference plane	162.4
232525	LONE ROCK GP	General Petroleum	Reference plane	1,120.9
230927	LONE ROCK MANNVILLE	Mannville commingled members	Reference plane	1,120.9
232103	LONE ROCK SPARKY	Sparky	Reference plane	1,120.9
231328	LONG LAKE WASECA	Waseca	Reference plane	900.9

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
441419	LOVERNA N BAKKEN	Bakken	Surface + reference	1,612.0
230030	LOVERNA N MANNVILLE	Mannville / basal Mannville	Reference plane	1,612.0
441435	LOVERNA S BAKKEN	Bakken	Surface + reference	2,189.9
227344	LOVERNA S VIKING	Viking	Surface + reference	2,189.9
240024	LOVERNA SUCCESS	Success	Surface + reference	1,497.7
227355	LOVERNA VIKING POOL	Viking	Surface + reference	1,002.1
441436	LOVERNA W BAKKEN	Bakken	Surface + reference	831.4
231341	LOW LAKE EAST WASECA	Waseca	Reference plane	129.4
232160	LOW LAKE SPARKY	Sparky	Reference plane	517.5
231302	LOW LAKE WASECA	Waseca	Reference plane	517.5
227335	LUCKY HILLS VIKING	Viking	Supported surface	3,621.1
441432	LUSELAND BAKKEN	Bakken	Surface + reference	3,451.4
230002	LUSELAND MANNVILLE	Mannville / basal Mannville	Reference plane	576.1
227352	LUSELAND VIKING	Viking	Supported surface	32,663.3
232126	MACKLIN SPARKY	Sparky	Reference plane	5,141.5
100035	Macklin W Cummings-Dina	Cummings-Dina	Reference plane	1,215.8
235018	MAIDSTONE E CUMMINGS	Cummings	Reference plane	3,179.3
230912	MAIDSTONE MANNVILLE	Mannville commingled members	Reference plane	4,806.6
231205	MAIDSTONE MCLAREN	McLaren	Reference plane	4,806.6
100052	MAIDSTONE N GP	General Petroleum	Reference plane	3,826.2
232156	MAIDSTONE SPARKY	Sparky	Reference plane	4,806.6
231152	MAIDSTONE W COLONY GAS	Colony	Reference plane	1,557.3
231322	MAIDSTONE WASECA	Waseca	Reference plane	4,806.6
231149	MANITO LAKE W COLONY SAND	Colony	Reference plane	784.7
232143	MANITO LK SPARKY	Sparky	Reference plane	5,074.3
231210	MANITOU LAKE EAST MCLAREN	McLaren	Reference plane	1,038.8

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
239007	MANTARIO E BASAL MANN	Mannville / basal Mannville	Reference plane	842.8
239005	MANTARIO N BASAL MANN	Mannville / basal Mannville	Reference plane	2,018.3
239024	MANTARIO S BASAL MANN	Mannville / basal Mannville	Reference plane	960.2
239010	MARENGO S BASAL MANN	Mannville / basal Mannville	Reference plane	1,559.5
227339	MARENGO VIKING	Viking	Supported surface	2,336.0
232111	MARSDEN N SPARKY	Sparky	Reference plane	565.5
232138	MARSDEN SOUTH SPARKY	Sparky	Reference plane	2,852.2
232105	MARSDEN SPARKY	Sparky	Reference plane	778.0
100031	MEOTA CENTRAL WASECA	Waseca	Reference plane	582.5
100020	MEOTA EAST COLONY	Colony	Reference plane	1,486.9
234123	MEOTA LLOYDMINSTER	Lloydminster	Reference plane	903.5
100045	Meota Waseca	Waseca	Reference plane	903.5
100048	MEOTA WEST CENTRAL G.P.	General Petroleum	Reference plane	645.3
232152	MERVIN CENTRAL SPARKY	Sparky	Reference plane	258.5
231345	MERVIN CENTRAL WASECA	Waseca	Reference plane	258.5
231343	MERVIN EAST WASECA	Waseca	Reference plane	1,032.9
230925	MERVIN SOUTH MANNVILLE	Mannville commingled members	Reference plane	2,001.6
232161	MERVIN SOUTH SPARKY	Sparky	Reference plane	2,001.6
231344	MERVIN SOUTH WASECA	Waseca	Reference plane	2,001.6
231332	MERVIN WASECA	Waseca	Reference plane	1,920.3
231156	MERVIN WEST COLONY SAND	Colony	Reference plane	520.0
230926	MERVIN WEST MANNVILLE	Mannville commingled members	Reference plane	520.0
231227	MERVIN WEST MCLAREN SAND	McLaren	Reference plane	520.0
441439	MILTON BAKKEN	Bakken	Supported surface	2,328.3
100021	Milton East Bakken	Bakken	Surface + reference	1,163.2

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
441482	MILTON SOUTH BAKKEN	Bakken	Surface + reference	452.9
240026	MILTON SOUTH SUCCESS	Success	Surface + reference	452.9
227328	MILTON VIKING	Viking	Supported surface	7,248.8
231105	NEILBURG COLONY	Colony	Reference plane	5,354.3
230911	NEILBURG MANNVILLE	Mannville commingled members	Reference plane	5,354.3
231203	NEILBURG MCLAREN	McLaren	Reference plane	5,354.3
100025	Neilburg N Mannville	Mannville / basal Mannville	Reference plane	1,613.2
100023	Neilburg N Rex	Rex	Reference plane	1,613.2
100022	Neilburg N Sparky	Sparky	Reference plane	1,613.2
441423	NORTH HOOSIER BAKKEN	Bakken	Supported surface	5,525.6
239021	NORTH HSR BASAL MANNVILLE	Mannville / basal Mannville	Reference plane	2,213.2
441433	NORTH SMILEY BAKKEN	Bakken	Supported surface	1,625.1
232134	NORTHMINSTER N SPARKY	Sparky	Reference plane	2,574.0
232509	NORTHMINSTER NORTH G.P.	General Petroleum	Reference plane	2,574.0
232108	NORTHMINSTER SPARKY	Sparky	Reference plane	3,853.3
239019	ONWARD BASAL MANNVILLE	Mannville / basal Mannville	Reference plane	324.1
239025	ONWARD N BASAL MANNVILLE	Mannville / basal Mannville	Reference plane	322.7
231117	PARADISE HILL COLONY	Colony	Reference plane	50.6
231331	PARADISE HILL WASECA	Waseca	Reference plane	50.6
232507	PIKES PEAK G.P.	General Petroleum	Reference plane	4,257.2
230920	PIKES PEAK MANNVILLE	Mannville commingled members	Reference plane	4,257.2
232128	PIKES PEAK SPARKY	Sparky	Reference plane	4,257.2
231312	PIKES PEAK WASECA	Waseca	Reference plane	4,257.2
227340	PLATO NORTH VIKING	Viking	Surface + reference	5,830.7
227345	PLENTY VIKING	Viking	Supported surface	10,833.2

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
441427	PLOVER LAKE BAKKEN	Bakken	Surface + reference	2,267.7
231209	PLOVER LAKE MCLAREN	McLaren	Reference plane	2,470.3
441445	PLOVER LAKE SOUTH BAKKEN	Bakken	Surface + reference	973.2
441450	PLOVER LAKE W BAKKEN	Bakken	Surface + reference	1,627.4
441480	PLOVER LK E BAKKEN	Bakken	Surface + reference	1,738.6
227303	PRAIRIEDALE EAST VIKING	Viking	Supported surface	8,575.7
227343	PRAIRIEDALE VIKING	Viking	Supported surface	22,801.2
227360	PRIMATE CT VIKING GAS	Viking	Supported surface	2,854.5
231226	PRIMATE E MCLAREN	McLaren	Reference plane	260.0
232159	PRIMATE E SPARKY	Sparky	Reference plane	260.0
230031	PRIMATE MANNVILLE	Mannville / basal Mannville	Reference plane	2,333.8
230036	PRIMATE SOUTH MANNVILLE	Mannville / basal Mannville	Reference plane	194.7
227361	PRIMATE WEST VIKING	Viking	Surface + reference	4,145.5
100032	PRINCE COLONY	Colony	Reference plane	161.5
100043	PRINCE EAST WASECA	Waseca	Reference plane	840.6
230035	REFLEX LAKE MANNVILLE	Mannville / basal Mannville	Reference plane	1,033.5
226419	REFLEX LAKE N ST WALBURG	St. Walburg	Reference plane	4,367.8
100049	REFORD SOUTH WASECA	Waseca	Reference plane	517.2
100051	REFORD WASECA	Waseca	Reference plane	2,198.3
231338	REWARD WASECA	Waseca	Reference plane	1,228.3
234124	REX LLOYD	Lloydminster	Reference plane	1,559.1
232519	RUSH LAKE GP	General Petroleum	Reference plane	5,293.7
230905	RUSH LAKE MANNVILLE	Mannville commingled members	Reference plane	5,293.7
232140	RUSH LAKE SPARKY	Sparky	Reference plane	5,293.7
231321	RUSH LAKE WASECA	Waseca	Reference plane	5,293.7
235918	RUTLAND CUMMINGS DINA	Cummings-Dina	Reference plane	517.7

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
234142	SALT LAKE LLOYDMINSTER	Lloydminster	Reference plane	2,140.3
230029	SALVADOR MANNVILLE	Mannville / basal Mannville	Reference plane	4,409.3
231155	SANDALL COLONY-MCLAREN	Colony-McLaren	Reference plane	1,306.1
227358	SEAGRAM LAKES VIKING	Viking	Supported surface	6,197.6
235920	SENLAC CUMMINGS DINA	Cummings-Dina	Reference plane	5,056.6
234139	SENLAC LLOYDMINSTER	Lloydminster	Reference plane	2,425.6
231215	SENLAC MCLAREN	McLaren	Reference plane	4,405.8
232146	SENLAC SPARKY	Sparky	Reference plane	4,405.8
231327	SENLAC WASECA	Waseca	Reference plane	388.9
231146	SENLAC WEST COLONY	Colony	Reference plane	4,143.7
232523	SILVERDALE G.P.	General Petroleum	Reference plane	4,987.8
230922	SILVERDALE MANNVILLE	Mannville commingled members	Reference plane	4,987.8
232101	SILVERDALE SPARKY	Sparky	Reference plane	4,987.8
441443	SMILEY BAKKEN	Bakken	Supported surface	325.3
227023	SMILEY DEWAR VIKING	Viking	Supported surface	5,364.7
235015	SODA LAKE CUMMINGS	Cummings	Reference plane	7,592.2
232520	STANDARD HILL N GP	General Petroleum	Reference plane	1,355.2
230923	STANDARD HILL N MANNVILLE	Mannville commingled members	Reference plane	1,355.2
233117	STANDARD HILL N REX	Rex	Reference plane	1,355.2
232148	STANDARD HILL N SPARKY	Sparky	Reference plane	1,355.2
231333	STANDARD HILL N WASECA	Waseca	Reference plane	1,355.2
231214	STANDARD HILL W MCLAREN	McLaren	Reference plane	258.6
231311	STANDARD HILL WASECA	Waseca	Reference plane	4,194.6
441420	SUPERB BAKKEN SAND	Bakken	Surface + reference	1,039.1
230037	SUPERB MANNVILLE	Mannville / basal Mannville	Reference plane	859.0
231336	SUPERB NORTH WASECA	Waseca	Reference plane	517.7

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
234128	T FLAGS N LLOYD/CUMMINGS	Lloydminster-Cummings	Reference plane	4,989.0
231144	TANGLEFLAGS COLONY	Colony	Reference plane	13,331.5
231204	TANGLEFLAGS E MCLAREN	McLaren	Reference plane	1,917.1
232505	TANGLEFLAGS G.P.	General Petroleum	Reference plane	13,331.5
234121	TANGLEFLAGS LLOYD	Lloydminster	Reference plane	13,331.5
230901	TANGLEFLAGS MANNVILLE	Mannville commingled members	Reference plane	13,331.5
231206	TANGLEFLAGS MCLAREN	McLaren	Reference plane	13,331.5
232506	TANGLEFLAGS NORTH G.P.	General Petroleum	Reference plane	4,989.0
232114	TANGLEFLAGS SPARKY	Sparky	Reference plane	13,331.5
226418	TANGLEFLAGS ST WALBURG	St. Walburg	Reference plane	6,561.8
223009	TANGLEFLAGS SWS	Second White Specks	Supported surface	6,561.8
234132	TANGLEFLAGS W LLOYD	Lloydminster	Reference plane	5,113.0
230907	TANGLEFLAGS W MANNVILLE	Mannville commingled members	Reference plane	5,113.0
232131	TANGLEFLAGS W SPARKY	Sparky	Reference plane	5,113.0
231340	TANGLEFLAGS WASECA	Waseca	Reference plane	13,331.5
232508	TANGLEFLAGS WEST G.P.	General Petroleum	Reference plane	5,113.0
231207	TANGLEFLAGS WEST MCLAREN	McLaren	Reference plane	5,113.0
227336	TOTNES VIKING	Viking	Supported surface	5,194.7
100008	Turtleford North Colony	Colony	Reference plane	1,364.2
232150	TURTLEFORD SPARKY	Sparky	Reference plane	267.4
231334	TURTLEFORD WASECA	Waseca	Reference plane	267.4
231150	TURTLELAKE COLONY	Colony	Reference plane	2,523.5
231347	TURTLELAKE WASECA	Waseca	Reference plane	2,523.5
232144	UNITY SOUTH SPARKY	Sparky	Reference plane	3,889.6
238704	UNITY SOUTH UNITY	Unity	Reference plane	3,889.6
227304	UNITY SOUTH VIKING	Viking	Supported surface	3,889.6
227354	UNITY VIKING SAND GAS	Viking	Supported surface	4,663.4

Pool code	Published pool name	Reservoir designation	Display placement	Clipped ha
232157	UNWIN SPARKY	Sparky	Reference plane	843.5
227346	VERENDRYE N VIKING	Viking	Supported surface	1,038.9
227321	VERENDRYE VIKING	Viking	Supported surface	5,650.0
100006	WESTHAZEL EAST COLONY	Colony	Reference plane	261.2
232510	WESTHAZEL G.P.	General Petroleum	Reference plane	4,341.4
230910	WESTHAZEL MANNVILLE	Mannville commingled members	Reference plane	4,341.4
232136	WESTHAZEL SPARKY	Sparky	Reference plane	4,341.4
231329	WESTHAZEL WASECA	Waseca	Reference plane	4,341.4
219121	WHITESIDE RIBSTONE CK	Ribstone Creek	Reference plane	10,622.2
219520	WHITESIDE S MILK RIVER	Milk River	Supported surface	6,221.7
227326	WHITESIDE VIKING	Viking	Supported surface	24,799.0
219122	WHITESIDE W RIBSTONE CK	Ribstone Creek	Reference plane	1,814.9
227341	WHITESIDE WEST VIKING	Viking	Supported surface	3,365.0
235007	WINTER CUMMINGS	Cummings	Reference plane	4,257.8
235008	WINTER SOUTH CUMMINGS	Cummings	Reference plane	1,164.4
231219	WINTER SOUTH MCLAREN	McLaren	Reference plane	259.4
231134	YONKER COLONY	Colony	Reference plane	1,290.1
231216	YONKER MCLAREN	McLaren	Reference plane	1,290.1

Numerical methods, correlations and reproducibility

Regional surfaces

Resample the original published final-cut triangles at 2 km nodes inside the combined west-central and central study rectangle; no extrapolation outside source triangles. Surfaces remain interpolated regional geological interpretations, not observations at every cell.

Resolution

2 km display grid; original source volumetric model is 2 km×2 km×10m. Not appropriate for local well placement or small-pool delineation.

Thickness

Explicit source-stratigraphic-column top/base difference; no net-pay calculation. A missing support mask is not proof of absence.

Historical controls

SPFPS public TVD picks; original source columns preserved. Actual formation picks remain distinct from erosional boundary picks. Independently displayed and not claimed to be the exact 2023 edited constraints.

Source model markers

Original 2023 XYZ markers retained by horizon; exported marker file lacks UWI identifiers, so marker count is not interpreted as number of wells.

Edge meaning

Original cut-surface boundaries may reflect geological limits or model boundary; zero edges cannot be assumed to delineate a seal or trap.

Preliminary cover

BaseQuaternary is a preliminary working surface. Use no shallow-geology interpretations from it.

Well separation

ModernIRIS wellbores and plan traces are stored separately; never deriveTD from deepest formation pick.

Composite intervals

The Second White Specks-to-Fish Scales interval includes Belle Fourche strata; it is not Second White Specks thickness alone. Upper Colorado is composite. Deadwood-to-Precambrian includes Earlie/basal Cambrian sandstone where present. Dawson Bay excludes separately modeled Second Red Bed, and Souris River excludes First Red Bed. Source interval definitions must be used when comparing formation isopachs; internal units and net reservoir thickness are not independently resolved.

Mannville members

Cantuar and Pense are the only released Mannville-scale numerical intervals. Dina, Cummings, Lloydminster, Rex, General Petroleums, Sparky, Waseca, McLaren and Colony are documentary local members, not independent model surfaces. Detailed member pools are not assigned fabricated member depths from these broad regional intervals.

Historical context

Available historical SPFPS controls are also retained in a separate 20 km projected buffer, for correlation context only. Provincial source and query-envelope limits still apply. No displayed surface is extended into the buffer.

Full triangle support

Every displayed finite-corner triangle is checked against the union of the original released cut triangles, including internal holes, with 1 mm numerical tolerance. A boundary node is conservatively set null wherever a triangle would cross unsupported source space. Gross intervals are checked against joint top-and-base support. This can slightly reduce displayed edge coverage; it cannot create a new surface or reservoir limit.

Vertical reference

Source GOCAD objects declare metres, positive elevation, Mean Sea Level. No specific modern geodetic vertical datum realization or conversion is asserted. Independent historical tops use KB minus reported TVD.

Specific model-correlation limits

- Numerical unit tops are regional correlation surfaces. The source model supports 45 display layers and 36 gross intervals in this clip; finer resampling or contour intervals do not improve its original geological resolution.
- Dina, Cummings, Lloydminster, Rex, GP, Sparky, Waseca, McLaren and Colony are documentary members. Cantuar/Pense links show broad context only. Pool depth is unresolved where an independent member surface is unavailable.
- The Viking-Newcastle-Flotten Lake surface is an explicitly composite regional horizon. Pool draping on that horizon is contextual placement, not the depth of a particular productive sand or oil-water contact.
- Ratner, Brightholme, individual potash beds and many Mississippian/younger units have no independent mesh. Entries are retained for the stratigraphic explanation, without inventing presence or thickness.
- Upper Colorado and above-Belly-River are grouped intervals. They cannot be interpreted as resolved Carlile, Niobrara, Pierre-member, Bearpaw or Horseshoe Canyon surfaces.
- Waseca internal incision and central hiatus correlations remain documentary evidence unless a location-resolved source surface exists. Conceptual diagrams do not generate depth meshes.
- A surface-support boundary or strict original-footprint mask is not a geological edge. Published zero edges retain source identity and unspecified genesis unless specific evidence resolves it.
- Modern well records are completion associations deduplicated to wellbores. Plan traces do not carry surveyed elevation. No surveyed 3D trajectories were recovered; assumed vertical geometry must be labelled and cannot reproduce a horizontal lateral.
- Terminal formation labels, total measured depth and true vertical depth are distinct attributes. Formation at TD must not be replaced by a producing completion zone.
- Known local study cutoffs such as Colony 75 API or historical Dodsland 10% porosity are not transferred to every well or formation.

See Figure 14 - Composite model intervals and local correlation requirements (earlier in this study).

Source surfaces and gross intervals

The table records the exact modeled top and bounding base. A composite framework interval can contain several named reservoir members that are discussed in the geological catalogue but not independently mapped. Top-only layers, including basement and unconformities, have no invented thickness.

Model layer	Source interval	Support and interpretation
Quaternary	DEM top to Unconformity Sub Quaternary	Preliminary source sub-Quaternary surface was approximately translated from DEM to markers. Original authors explicitly advise against its use for shallow-geology studies. Cover is undivided and is not a Cenozoic reservoir model. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.

Model layer	Source interval	Support and interpretation
Above Belly River	Unconformity Sub Quaternary top to Belly River	Preliminary source sub-Quaternary surface was approximately translated from DEM to markers. Original authors explicitly advise against its use for shallow-geology studies. Cover is undivided and is not a Cenozoic reservoir model. Unit top is restricted to nodes with both explicit source-column boundaries and positive gross interval >0.5m. The complete unconformity is shown separately; its extent does not establish presence of this unit. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Sub-Quaternary unconformity	Erosional surface only; no thickness.	Published erosional bounding surface. Its presence does not establish which underlying or overlying reservoir unit is preserved. No net pay, reservoir thickness or seal quality inferred. No thickness assigned to an unconformity surface.
Belly River	Belly River top to Lea Park	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Lea Park	Lea Park top to Unconformity Sub Lea Park	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Milk River	Unconformity Sub Lea Park top to Upper Colorado	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Unit top is restricted to nodes with both explicit source-column boundaries and positive gross interval >0.5m. The complete unconformity is shown separately; its extent does not establish presence of this unit. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Sub-Lea Park unconformity	Erosional surface only; no thickness.	Published erosional bounding surface. Its presence does not establish which underlying or overlying reservoir unit is preserved. No net pay, reservoir thickness or seal quality inferred. No thickness assigned to an unconformity surface.
Upper Colorado	Published Upper Colorado top to Second White Specks marker: a composite regional interval.	Upper Colorado is a composite regional interval in the released model. Its individual internal formations, members and reservoir facies are not independently resolved. Regional top and gross thickness do not identify a productive reservoir. Gross vertical separation of the published Upper Colorado and Second White Specks markers. Constituent formations and members are not independently separated; this is not a single reservoir thickness or net pay.

Model layer	Source interval	Support and interpretation
2nd White Specks	Second White Specks marker to Fish Scales marker: a composite interval including Belle Fourche strata.	The displayed top is the published Second White Specks marker. The interval below it extends to Fish Scales and includes Belle Fourche strata; those constituent units are not independently separated by this regional model. Source cut boundaries include geological truncation and model support limits. Gross vertical separation of the published Second White Specks and Fish Scales markers. This composite interval includes Belle Fourche strata and is not the thickness of the Second White Specks alone, reservoir net thickness or net pay.
Fish Scales	Fish Scales top to Westgate	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Westgate	Westgate top to Viking Newcastle Flotten Lake	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Viking Newcastle Flotten Lake	Viking Newcastle Flotten Lake top to Joli Fou	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Joli Fou	Joli Fou top to Pense	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Pense	Pense top to Cantuar	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Cantuar	Cantuar top to Unconformity Sub Cantuar	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.

Model layer	Source interval	Support and interpretation
Success	Unconformity Sub Cantuar top to Unconformity Sub Success	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Unit top is restricted to nodes with both explicit source-column boundaries and positive gross interval >0.5m. The complete unconformity is shown separately; its extent does not establish presence of this unit. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Sub-Cantuar unconformity	Erosional surface only; no thickness.	Published erosional bounding surface. Its presence does not establish which underlying or overlying reservoir unit is preserved. No net pay, reservoir thickness or seal quality inferred. No thickness assigned to an unconformity surface.
Sub-Success unconformity	Erosional surface only; no thickness.	Published erosional bounding surface. Its presence does not establish which underlying or overlying reservoir unit is preserved. No net pay, reservoir thickness or seal quality inferred. No thickness assigned to an unconformity surface.
Lower Shaunavon	Lower Shaunavon top to Upper Gravelbourg	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Upper Gravelbourg	Upper Gravelbourg top to Lower Gravelbourg	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Lower Gravelbourg	Lower Gravelbourg top to Upper Watrous	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Upper Watrous	Upper Watrous top to Lower Watrous	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Lower Watrous	Lower Watrous top to Unconformity Sub Mesozoic	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.

Model layer	Source interval	Support and interpretation
Sub-Mesozoic unconformity	Erosional surface only; no thickness.	Published erosional bounding surface. Its presence does not establish which underlying or overlying reservoir unit is preserved. No net pay, reservoir thickness or seal quality inferred. No thickness assigned to an unconformity surface.
Bakken	Bakken top to Unconformity Sub Mississippian	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Big Valley	Unconformity Sub Mississippian top to Torquay	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Unit top is restricted to nodes with both explicit source-column boundaries and positive gross interval >0.5m. The complete unconformity is shown separately; its extent does not establish presence of this unit. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Sub-Mississippian unconformity	Erosional surface only; no thickness.	Published erosional bounding surface. Its presence does not establish which underlying or overlying reservoir unit is preserved. No net pay, reservoir thickness or seal quality inferred. No thickness assigned to an unconformity surface.
Torquay	Torquay top to Birdbear	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Birdbear	Birdbear top to Duperow	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Duperow	Duperow top to Souris River	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.

Model layer	Source interval	Support and interpretation
Souris River	Souris River top to 1st Red Bed	The source column models First Red Bed separately. This Souris River gross interval excludes that separately modeled red-bed interval; stratigraphic nomenclature must be checked before comparing published formation isopachs. Gross vertical separation of the published Souris River top and First Red Bed top. The separately modeled First Red Bed interval is excluded; this is not total Souris River thickness under classifications that include that basal member, nor reservoir net thickness.
1st Red Bed	1st Red Bed top to Dawson Bay	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Dawson Bay	Dawson Bay top to 2nd Red Bed	The source column models Second Red Bed separately. This Dawson Bay gross interval excludes that separately modeled red-bed interval; stratigraphic nomenclature must be checked before comparing published formation isopachs. Gross vertical separation of the published Dawson Bay top and Second Red Bed top. The separately modeled Second Red Bed interval is excluded; this is not total Dawson Bay thickness under classifications that include that basal member, nor reservoir net thickness.
2nd Red Bed	2nd Red Bed top to Prairie Evaporite	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Prairie Evaporite	Prairie Evaporite top to Winnipegosis	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Winnipegosis	Winnipegosis top to Ashern	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Ashern	Ashern top to Meadow Lake	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.

Model layer	Source interval	Support and interpretation
Interlake	Unconformity Top LPaleo top to Stonewall	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Unit top is restricted to nodes with both explicit source-column boundaries and positive gross interval >0.5m. The complete unconformity is shown separately; its extent does not establish presence of this unit. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Top Lower Paleozoic unconformity	Erosional surface only; no thickness.	Published erosional bounding surface. Its presence does not establish which underlying or overlying reservoir unit is preserved. No net pay, reservoir thickness or seal quality inferred. No thickness assigned to an unconformity surface.
Stonewall	Stonewall top to Stony Mountain	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Stony Mountain	Stony Mountain top to Red River	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Red River	Red River top to Winnipeg	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Winnipeg	Winnipeg top to Deadwood	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.
Deadwood	Published Deadwood top to Precambrian: composite basal Cambrian-Ordovician interval, including Earlie/basal Cambrian sandstone where present.	The source column places Precambrian directly below the Deadwood top. The resulting composite interval includes Earlie/basal Cambrian sandstone where present; these underlying units have no independent surfaces in this release. Gross vertical separation of the published Deadwood top and Precambrian surface. This includes Earlie and basal Cambrian sandstone where present; it is not an isolated Deadwood Formation isopach or reservoir net thickness.

Model layer	Source interval	Support and interpretation
Precambrian	Precambrian top to unknown basement base	Regional formation framework. Original source cut boundaries include geological truncation and model limits; local pool depth, pay and quality require well/log control. Gross vertical difference between source-column top and base surfaces only where both have original triangle support; negative differences and unsupported bases are null. Not reservoir net thickness or net pay.

Source units without accepted local geometry

Unit	Source interval	Support result
Masefield	Unconformity Sub Success top to Rierdon	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Rierdon	Rierdon top to Upper Shaunavon	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Upper Shaunavon	Upper Shaunavon top to Lower Shaunavon	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Big Snowy	Unconformity Sub Mesozoic top to Poplar	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Poplar	Poplar top to Ratcliffe	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Ratcliffe	Ratcliffe top to Midale	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Midale	Midale top to Frobisher	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Frobisher	Frobisher top to Kisbey	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Kisbey	Kisbey top to Alida	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Alida	Alida top to Tilston	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Tilston	Tilston top to Souris Valley	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.

Unit	Source interval	Support result
Souris Valley	Souris Valley top to Bakken	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.
Meadow Lake	Meadow Lake top to Unconformity Top LPaleo	No supported positive gross interval or top nodes within the clipped source model. Source cut limits may reflect geological truncation, original model extent or unresolved thin intervals; no surface is extrapolated.

Recommended local workflow

- step: 1; title: Choose a documented pool and exact interval; detail: Read official pool and completion-zone records; distinguish oil, gas and mixed designations, and match full wellbore/event identifiers.
- step: 2; title: Verify the stratigraphic section; detail: Tie a local reference log, top and base, core/cuttings and age markers. Check whether a formation is preserved before inferring a reservoir.
- step: 3; title: Compare depositional hypotheses; detail: Use sedimentary structures, ichnology, grain size, facies stacking and lateral relations. A log motif alone cannot distinguish shoreface, delta, estuary or channel.
- step: 4; title: Map sand, carbonate pores and seals separately; detail: Use net connected reservoir, cap and lateral baffles rather than gross thickness. Compare productive, wet, tight and absent-section wells.
- step: 5; title: Resolve erosion and salt timing; detail: Separate original deposition from truncation, collapse and data limits. Date relief relative to reservoir fill and petroleum charge.
- step: 6; title: Test the petroleum system; detail: Establish source/migration, fluids, pressure, sealing and preservation. Only then delineate a conditional target using local evidence.
- step: 7; title: Inspect numerical maps at appropriate resolution; detail: Compare structure, gross intervals, official zero edges and original support. User contour spacing changes display density, not source certainty.

Scientific limits

- This is a public-data regional synthesis. It does not contain a new systematic interpretation of every LAS/log image, physical core, drill-stem test or production history.
- Catalogue availability and well density do not measure reservoir quality. Multiple cores/cuttings records can belong to one wellbore, and many modern wellbores have no deep formation picks.
- Pool polygons are official administrative designations; their outlines are not measured reservoir contact surfaces, remaining-oil boundaries or prospect limits.
- No surveyed 3D well paths were available in the acquired public sources. Horizontal plan traces are shown only with their stated uncertainty; a vertical assumption is not a reconstructed lateral.
- Published interpretation changes through time. Source-dependent ranks, ages and correlations are retained as such; anomalous numeric age metadata in legacy lexicons is not copied.
- Exact local palaeoshorelines, reefs and subsurface erosional features cannot be uniquely recovered from regional tops and thickness alone.
- Historical reservoir properties are specific to the cited sample selection, method and date. They are not modern reserves or expected well performance.
- No land ownership, mineral tenure, current leasing availability or economic ranking is evaluated.

Portable and offline use

The download cards describe each portable model and its coordinate convention, vertical exaggeration and any display decimation. The offline viewer uses its included loopback server because direct file opening can block module/data loading. WebXR availability depends on the browser and headset. Desktop interaction and numerical geometry can be checked without a headset; physical headset operation is not claimed unless separately recorded.

References and data sources

Bracketed identifiers refer to this source register. Original figures are either supported numerical plots or labelled conceptual reconstructions. Provincial and federal data are attributed to their publishers. This is an independent GeoNavigate study, without implied government endorsement. Linked source reports are not republished as appendices.

[S01] Bédard, Marsh, Hillier & Music (2023). 3D geological model of the Western Canadian Sedimentary Basin in Saskatchewan, Canada. GSC Open File 8969

Regional geometrical framework. Modeled tops and erosional surfaces are not reservoir facies or effective porosity. Source vintage is distinct from the current well inventory.

https://doi.org/10.4095/331747

[S02] Marsh & Love (2014). Regional Stratigraphic Framework of the Phanerozoic in Saskatchewan. SGS Open File 2014-1

Official structure, isopach and zero-edge framework. Original maps used modified 2 km kriged grids; resampling does not create finer geological resolution.

https://gis.saskatchewan.ca/arcgis/rest/services/Economy/Geoscience_Maps_and_Publications/MapServer

[S03] Christopher (2003). Jura-Cretaceous Success Formation and Lower Cretaceous Mannville Group of Saskatchewan. SGS Report 223

Province-wide original stratigraphic synthesis. The Dina-Waseca/Cantuar and McLaren-Colony/Pense correspondence is a regional correlation scheme, not proof of member surfaces at every well.

https://pubsaskdev.blob.core.windows.net/pubsask-prod/90783/90783-Final_Report_223_Text.pdf

[S04] Hayes and colleagues (1994). Cretaceous Mannville Group. Geological Atlas of the WCSB, chapter 19

Regional basin geometry, sediment supply, nomenclature and diachronous shoreline migration. Historical resource totals are not used.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-19-cretaceous-mannville-group

[S05] Bauer, Hubbard, Leckie & Dolby (2010). Depositional History of the Cretaceous Dina-Cummings Interval: Implications for Reservoir Development, Winter Pool, West-Central Saskatchewan. GeoCanada abstract

Original conference study of 200 vertical wells and 10 cores. Published interpretations and illustrations were reviewed; this project did not relog those physical cores.

https://geoconvention.com/wp-content/uploads/abstracts/2010/0254_GC2010_Depositional_History_Creatceous_Dina-Cummings_Interval.pdf

[S06] Morshedian, MacEachern & Dashtgard (2012). Stratigraphic Framework for the Lower Cretaceous Upper Mannville Group (Sparky, Waseca, and McLaren Alloformations) in the Lloydminster Area, West-central Saskatchewan. SGS SOI 2011, paper A-3

Correct publication year is 2012 in the 2011 volume. Core, ichnology and correlation support multiple coastal facies and an internal Waseca unconformity. Alloformation boundaries are not automatically equivalent to legacy pool-zone picks.

https://pubsaskdev.blob.core.windows.net/pubsask-prod/94286/94286-A-3_Morshedian_et_al.pdf

[S07] Morshedian and colleagues (2019). Systems tracts and their bounding surfaces in the low-accommodation Upper Mannville group, Saskatchewan, Canada. Marine and Petroleum Geology

Public primary abstract consulted. Published maximum incision is study-local; inaccessible full-text measurements are not assumed.

https://doi.org/10.1016/j.marpetgeo.2019.07.011

[S08] Flynn (2018). Reservoir Characterization and Controls on Hydrocarbon Distribution within the Colony Member, Pense Formation, Mannville Group, West-central Saskatchewan. SGS SOI 2018, paper A-1

Fifteen-page original study using over 500 well logs and core. Correct paper number A-1 is verified on the title page. Published porosity, cutoffs and channel dimensions are local examples only.

https://pubsaskdev.blob.core.windows.net/pubsask-prod/110830/110493-A-01_Flynn.pdf

[S09] Mathison (2012). The Dodsland Viking Tight Oil Play: Stacked Wave-Reworked, Shallow-Shelf Deltas. CSPG Reservoir, July/August 2012

Published technical-luncheon abstract, not a full peer-reviewed regional map. Public indexed abstract consulted; direct PDF download returned 403. Its stacked-delta reconstruction is a testable local interpretation, not an exclusive model for every Viking sand.

https://www.cspg.org/common/Uploaded%20files/pdfs/documents/publications/reservoir/2012/Reservoir-2012-0708.pdf

[S10] Koncohrada & Freitag (1964). Dodsland Viking Sand: Primary Recovery and Pressure Maintenance Possibilities. Saskatchewan Report 85

Historical engineering report based on a 1961 study updated through the early 1960s. Core averages and cutoffs are dated observations, not modern reserves, expected well performance or regional petrophysical properties.

https://pubsaskdev.blob.core.windows.net/pubsask-prod/38210/38210-Report-85_Dodsland_Viking_Sand_Primary_Recovery_%26_Pressure_Maintenance_Possibilities.pdf

[S11] Reinson, Warters, Cox & Price (1994). Cretaceous Viking Formation. Geological Atlas of the WCSB, chapter 21

Regional sequence stratigraphy and competing sand-body models. Gross formation geometry cannot distinguish a valley, shoal or shoreface without local evidence.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-21-cretaceous-viking-formation

[S12] McNeil & Gilboy (2000). Cretaceous Stratigraphy in Four Cores from the Vicinity of the Fort-à-la-Corne Kimberlite Field, East-central Saskatchewan: Preliminary Results. SGS SOI 2000, volume 1

Actual published core sections: Fairy Glen, Leather River, Crooked River, and Smeaton. Local thicknesses and biostratigraphic hiatuses are not petroleum discoveries. Proposed regional uplift mechanism was explicitly unresolved.

https://pubsaskdev.blob.core.windows.net/pubsask-prod/88589/88589-McNeil-Gilboy_2000_volume1_MiscRep2000-4.1.pdf

[S13] Edwards (1960). Cretaceous Spinney Hill Sand in West-Central Saskatchewan. Journal of the Alberta Society of Petroleum Geologists 8(5), 141-153

Public original abstract: glauconitic marine sand and shale, eastern/northeastern Shield supply, deltaic-tidal-flat marine transition. Full subscription article was not accessed.

https://archives.datapages.com/data/cspg/data/008/008005/0141.htm

[S14] Leckie and colleagues (1994). Cretaceous Colorado/Alberta Group. Geological Atlas of the WCSB, chapter 20

Regional nomenclature includes Spinney Hill, Big River, St. Walburg and white-speckled marine intervals. Historical production statistics are not adopted.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-20-cretaceous-coloradoalberta-group

[S15] Meijer Drees (1994). Devonian Elk Point Group. Geological Atlas of the WCSB, chapter 10

Platform, basin, evaporite and dissolution framework; relief produced by salt loss must not be read automatically as tectonic uplift or a reef.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapters/chapter-10-devonian-elk-point-group

[S16] Jin & Bergman (2001). Revised Stratigraphy of the Middle Devonian (Givetian) Winnipegosis Carbonate-Prairie Evaporite Transition, Elk Point Group, Southern Saskatchewan. Bulletin of Canadian Petroleum Geology 49(4), 441-457

Public primary abstract and publication metadata consulted. Ratner terminology was revised after older regional nomenclature; no separate Ratner mesh is inferred from a Winnipegosis top.

https://archives.datapages.com/data/cspg/data/049/049004/0441.htm

[S17] Utha-aroon (1990). Sedimentary Depositional Environment of the Prairie Evaporite Formation, Saskatoon Region. University of Saskatchewan MSc thesis

Repository abstract describes core, thin-section and mine observations. Specific evaporite-environment interpretation is attributed to the author; the full thesis was not downloaded.

https://harvest.usask.ca/items/51671f21-6ebe-4c5e-af0e-6e25b9229e89

[S18] Creaney and colleagues (1994). Petroleum Generation and Migration. Geological Atlas of the WCSB, chapter 31

Regional petroleum systems, long-distance migration and biodegradation. Historical source attribution is not a local geochemical match; it cannot establish charge under a selected central Saskatchewan parcel.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-31-petroleum-generation-and-migration

[S19] Slind and colleagues (1994). Middle Cambrian to Lower Ordovician Strata. Geological Atlas of the WCSB, chapter 8

Interior-platform clastics and later erosional preservation.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapters/chapter-8-middle-cambrian-lower

[S20] Norford and colleagues (1994). Middle Ordovician to Lower Devonian Strata. Geological Atlas of the WCSB, chapter 9

Warm-water carbonate platform, Williston subsidence and later removal of the northern succession.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapters/chapter-9-middle-ordovician-lower

[S21] Oldale & Munday (1994). Devonian Beaverhill Lake Group. Geological Atlas of the WCSB, chapter 11

Souris River shelf cycles and northwestern basinward progradation; not a local reef map for Saskatoon.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-11-devonian-beaverhill-lake-group

[S22] Switzer and colleagues (1994). Devonian Woodbend-Winterburn Strata. Geological Atlas of the WCSB, chapter 12

Duperow platform and Alberta basin/reef relationships; avoid transferring Alberta Leduc reef geometry directly into Saskatchewan Duperow.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-12-devonian-woodbend-winterburn-strata

[S23] Halbertsma (1994). Devonian Wabamun Group. Geological Atlas of the WCSB, chapter 13

Torquay-Big Valley regional correspondence, exposure and evaporitic cycles.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-13-devonian-wabamun-group

[S24] Richards and colleagues (1994). Carboniferous Strata. Geological Atlas of the WCSB, chapter 14

Regional carbonate-ramp framework; southern Saskatchewan subdivisions are not automatically present across the northern study window.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-14-carboniferous-strata

[S25] Poulton and colleagues (1994). Jurassic and Lowermost Cretaceous Strata. Geological Atlas of the WCSB, chapter 18

Northern erosion and discontinuous preserved Jurassic-earliest Cretaceous remnants.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-18-jurassic-and-lowermost-cretaceous

[S26] Dawson and colleagues (1994). Uppermost Cretaceous and Tertiary Strata. Geological Atlas of the WCSB, chapter 24

Diachronous clastic wedges, western/eastern naming and subsequent preservation. Horseshoe Canyon terminology is not a substitute for the Viking oil reservoir.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-24-uppermost-cretaceous-and-tertiary

[S27] Saskatchewan Geological Survey (2021). Mannville Group Heavy Oil in Saskatchewan. Prospect Saskatchewan, issue 13

Government synthesis of west-central heavy-oil geology. Production numbers in the original publication are historical and are not used as current totals.

https://pubsaskdev.blob.core.windows.net/pubsask-prod/133781/Prospect%252BSask%252BIssue%252B13_Mannville%252BGroup.pdf

[S28] Saskatchewan Ministry of Energy and Resources. Official oil and gas pool inventory

Official administrative pool geometry and attributes, retrieved 2026-10-28. A designation is not a measured reservoir contact, remaining resource or current production test.

https://gis.saskatchewan.ca/egis/rest/services/Economy/Resource_Map/FeatureServer/4

[S29] Fenton, Schreiner, Nielsen & Pawlowicz (1994). Quaternary Geology of the Western Plains. Geological Atlas of the WCSB, chapter 26

Glacial deposits, buried valleys and erosional cover; shallow water-bearing units are not petroleum reservoir recommendations.

https://ags.aer.ca/publications/atlas-western-canada-sedimentary-basin/chapter-26-quaternary-geology-western-plains

[S30] Chabanole & Buatois (2017). The Upper Devonian-Lower Mississippian Bakken Formation of west-central Saskatchewan: stratigraphic architecture and sequence stratigraphy of a conventional heavy oil reservoir. Bulletin of Canadian Petroleum Geology 65(3), 343-365

Public primary abstract consulted. Western tidal/marginal-marine sandstone is distinct from the southeast tight-oil facies. Quoted property thresholds describe the studied sandstone, not a regional predictive model.

https://archives.datapages.com/data/cspg/data/065/065003/343_cspg650343.htm

[S31] Chabanole (2015). Sedimentology, ichnology, and stratigraphic architecture of the Upper Devonian-Lower Mississippian Bakken Formation, west-central Saskatchewan. University of Saskatchewan thesis

Repository abstract consulted. Core-described open-marine and marginal-marine facies associations supply a western Bakken depositional interpretation; no new digitization of its full core dataset is claimed.

https://harvest.usask.ca/items/151ed087-f2ed-413b-8066-f723ca376927

[S32] Saskatchewan Ministry of Energy and Resources. Current petroleum wellbore inventory and sample catalogues

Source features are completion associations. Exact wellbores, plan traces, terminal depths and sample availability require distinct treatment; acquisition and reconciliation details are in the release source manifest.

https://gis.saskatchewan.ca/arcgis/rest/services/Economy/Petroleum/MapServer

[L-earlie] Natural Resources Canada Weblex: Earlie

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/004000/GSCC00053004396.html

[L-deadwood] Natural Resources Canada Weblex: Deadwood

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/003000/GSCC00053003832.html

[L-winnipeg] Natural Resources Canada Weblex: Winnipeg

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/016000/GSCC00053016596.html

[L-black-island] Natural Resources Canada Weblex: Black Island

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/001000/GSCC00053001436.html

[L-ice-box] Natural Resources Canada Weblex: Ice Box

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/006000/GSCC00053006881.html

[L-red-river] Natural Resources Canada Weblex: Red River

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/012000/GSCC00053012586.html

[L-stony-mountain] Natural Resources Canada Weblex: Stony Mountain

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/014000/GSCC00053014604.html

[L-stonewall] Natural Resources Canada Weblex: Stonewall

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/014000/GSCC00053014592.html

[L-interlake] Natural Resources Canada Weblex: Interlake

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/006000/GSCC00053006978.html

[L-meadow-lake] Natural Resources Canada Weblex: Meadow Lake

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/009000/GSCC00053009544.html

[L-ashern] Natural Resources Canada Weblex: Ashern

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/000000/GSCC00053000496.html

[L-winnipegosis] Natural Resources Canada Weblex: Winnipegosis

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/016000/GSCC00053016600.html

[L-prairie-evaporite] Natural Resources Canada Weblex: Prairie Evaporite

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/012000/GSCC00053012175.html

[L-dawson-bay] Natural Resources Canada Weblex: Dawson Bay

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/003000/GSCC00053003793.html

[L-souris-river] Natural Resources Canada Weblex: Souris River

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/014000/GSCC00053014085.html

[L-manitoba] Natural Resources Canada Weblex: Manitoba Group

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/009000/GSCC00053009101.html

[L-duperow] Natural Resources Canada Weblex: Duperow

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/004000/GSCC00053004331.html

[L-birdbear] Natural Resources Canada Weblex: Birdbear

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/001000/GSCC00053001392.html

[L-torquay] Natural Resources Canada Weblex: Torquay

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/015000/GSCC00053015339.html

[L-big-valley] Natural Resources Canada Weblex: Big Valley

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/001000/GSCC00053001333.html

[L-bakken] Natural Resources Canada Weblex: Bakken

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/000000/GSCC00053000705.html

[L-madison] Natural Resources Canada Weblex: Madison

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/008000/GSCC00053008973.html

[L-watrous] Natural Resources Canada Weblex: Watrous

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/016000/GSCC00053016133.html

[L-gravelbourg] Natural Resources Canada Weblex: Gravelbourg

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/005000/GSCC00053005876.html

[L-shaunavon] Natural Resources Canada Weblex: Shaunavon

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/013000/GSCC00053013611.html

[L-vanguard] Natural Resources Canada Weblex: Vanguard

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/015000/GSCC00053015770.html

[L-cantuar] Natural Resources Canada Weblex: Cantuar

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/002000/GSCC00053002280.html

[L-joli-fou] Natural Resources Canada Weblex: Joli Fou

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/007000/GSCC00053007217.html

[L-westgate] Natural Resources Canada Weblex: Westgate

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/016000/GSCC00053016299.html

[L-belle-fourche] Natural Resources Canada Weblex: Belle Fourche

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/001000/GSCC00053001121.html

[L-first-white-specks] Natural Resources Canada Weblex: First White Speckled Shale

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/004000/GSCC00053004961.html

[L-milk-river] Natural Resources Canada Weblex: Milk River

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/009000/GSCC00053009784.html

[L-lea-park] Natural Resources Canada Weblex: Lea Park

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/008000/GSCC00053008323.html

[L-belly-river] Natural Resources Canada Weblex: Belly River

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/001000/GSCC00053001144.html

[L-colorado] Natural Resources Canada Weblex: Colorado

Stratigraphic definition and geographic relationships, compiled from the CSPG Lexicon. Historical numeric age scales and anomalous metadata are not copied. A lexicon distribution is not a local reservoir map.

https://weblex.canada.ca/html/003000/GSCC00053003233.html