

Table 1: Summary of petroleum exploration plays in the Interior Platform of the Mackenzie Corridor

Play Name	Territory/Province	Exploration regions	Play type	Reservoir	Source	Gas/Oil	Seal	Trap style	Discoveries/shows	Exploration risks	Oil reserve (10 ⁶ m ³) (in-place)	Gas reserve (10 ⁶ m ³) (in-place)	Total Oil resource (10 ⁶ m ³) (in-place) (mean)	Total Gas resource (10 ⁶ m ³) (in-place) (mean)	Number of fields	Author	Methodology	Comments on resource volumes	
1) Proterozoic sediments	Northwest Territories; Yukon; Nunavut	Colville Hills; Great Bear Plain; Anderson Plain; Peel Plain; Peel Plateau; Horton Plain; Great Slave Plain	Conceptual	potentially carbonate & sandstone units in Dismal Lakes Group & Mackenzie Mountains Supergroup	Dismal Lakes shales; black shales in Little Dal Group	gas; oil possible	regional top seal unknown; lateral seal may be shales of Little Dal Group	faulted anticlines; platformal buildups; anticlines; thrust faults; normal faults; onlap against structural highs; sub- Cambrian angular unconformity traps	none	Adequate reservoir, source and seal									
2) Cambrian clastics	Northwest Territories; Nunavut	Colville Hills; Great Bear Plain; Anderson Plain; Horton Plain; Great Slave Plain	Established-immature (gas) Conceptual (oil)	Mount Clark sandstones; lower Mount Cap dolomitic siltstones, sandstones and dolomites	algal-rich shales in Mount Cap; possible Proterozoic sediment source for gas	gas; oil possible	Mount Cap shales; Saline River salts; faults seals possible	flower structures; roll-over anticlines in grabens affected by extensional reactivation of Proterozoic faults; stratigraphic pinchouts & onlap against basement highs; lateral facies pinchouts	4 gas and/or condensate pools in Colville Hills; Tedj Lake K-24, Tweed Lake M-47, Bele O-35; also 3 gas flows on DSTs; Nogha O-47, Tweed Lake A-67, Ewekka C-11 2 successful gas wells; Nogha C-49, Nogha M-17	Adequate reservoir; adequate source; communication with source		6084		187611	80	Canadian Gas Potential Committee, 2001	Petrimex-modified discovery process		
3) Lower Paleozoic platform	Northwest Territories; Yukon Territory	Great Slave Plain; Great Bear Plain; Anderson Plain; Peel Plain; Peel Plateau; Colville Hills	Conceptual	Mount Kindle, Franklin Mountain & Whittaker carbonates; Little Doctor member sandstones	Road River shales; overlying Middle Devonian or Cretaceous shales	gas; oil	Bear Rock anhydrites; tight Mount Kindle dolomites; Devonian & Cretaceous shales	structural drapes over Saline River salt solution features; structural drape over basement highs; stratigraphic pinchouts; sub-Cretaceous angular unconformity trap	1 gas flow in DST near platform edge in Peel Plateau; Peel H-71	Adequate reservoir; timing and seal; suitable source rock				5884	28	Drummond, 2004	@ Risk	Deh Cho area	
4) Pre-mid-Devonian basal clastics	Northwest Territories; Alberta	Great Slave Plain	Conceptual	Basal pre-Devonian clastics	Mirage Point & Lower Chinchaga evaporites & shales; Mid-Devonian shales	sour gas; oil possible	Mirage Point & Lower Chinchaga evaporites	onlap & pinchouts on basement highs; basement grabens	possible gas flow in DST	Adequate reservoir; isolation from source, top seal					6071	31	Drummond, 2004	@ Risk	Deh Cho area
5) Amica/Landry platform	Northwest Territories; Yukon Territory; British Columbia	Great Slave Plain	Conceptual	Amica, Landry, & Bear Rock carbonates	interbedded algal laminites; Funeral & Headless shales; Lower Chinchaga evaporites; Road River shales	sour gas; oil	tight Landry carbonates; Lower Chinchaga evaporites; Headless shales; argillaceous limestones in Hume; Cretaceous shales in Great Bear Plain	diagenetic post-depositional leaching; sedimentary and hydrothermal dolomitization; possible minor buildups on platform; updip porosity pinchouts; fault-bounded closures; folds associated with underlying salt tectonics	3 gas flows in DST's; S. Arrowhead B-76, Arrowhead River I-75, Mountain River H-47 1 oil recovery in DST; Shoals C-31	Adequate reservoir; isolation from source, top seal; adequate timing, closure				15856	103	Drummond, 2004	@ Risk	Deh Cho area	
6) Lonely Bay/Nahanni/Hume platform	Northwest Territories; Yukon Territory; British Columbia	Great Slave Plain; Great Bear Plain; Anderson Plain; Peel Plain	Conceptual	Lonely Bay & Nahanni dolomites Hume limestones	Horn River & Muskwa shales; Bluefish member & Canol shales	sour gas; oil	Horn River shales; Upper Chinchaga evaporites; tight Lonely Bay/Nahanni/Hume limestones; Hare Indian & Canol shales	secondary fracture dolomitization; minor buildups on platform; thrust sheets antiforms to the west; shelf edge reefs; pinnacle reef buildups; patch reefs or subtle facies changes in platforms	2 gas flows in DSTs (NWT); S. Arrowhead B-76; N.W.T. Province #1 K-31 2 oil recoveries in DSTs (NWT); Mills Lake C-03, Mills Lake C-60 1 undefined gas pool & 3 gas flows in DSTs in BC	Adequate reservoir				18186	103	Drummond, 2004	@ Risk	Deh Cho area	
7) Keg River back-barrier shelf & shelf basin	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature	Keg River dolomites	organic-rich Muskeg evaporites; Horn River shales	oil and gas	Muskeg evaporites; Watt Mountain shales	dolomitized isolated reefs; patch reefs or subtle facies changes in platforms; shelf edge reefs	4 non-associated gas pools in NWT (all in Cameron Hills field) 53 oil pools in Alberta; 22 containing solution gas 3 non-associated gas pools in Alberta	Dolomitization	8.76	388	6.68	3247	32 (oil); 39 (gas)	Drummond, 2004	@ Risk	Northwest Territories only	
8) Keg River platform – Cordova Embayment	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature	Keg River (Pine Point) dolomites	Horn River & Muskwa shales	sour gas	Horn River shales	hydrothermal dolomitization	13 gas pools in BC	Dolomitization; top seal		2433		4504	80	Reinson et al., 1993	Petrimex-discovery process	Total play area	
														884	20	Drummond, 2004	@ Risk	Northwest Territories only; defined play also includes Keg River isolated reefs	
9) Keg River offshore isolated reef – Utahn Embayment	Northwest Territories; British Columbia	Great Slave Plain	Established-mature	Keg River (Pine Point) dolomites	Horn River & Muskwa shales	sour gas	Horn River & Muskwa shales; tight Slave Point limestones	dolomitized isolated reefs	46 gas pools in BC	Dolomite distribution in individual reefs		148689		137941	300	Reinson et al., 1993	Petrimex-discovery process	Total play area	
10) Keg River offshore isolated reef – Horn Plateau	Northwest Territories	Great Slave Plain	Conceptual	Keg River carbonates	Horn River, Muskwa, & Buffalo River shales	sour gas; oil	Horn River & Muskwa shales	isolated reefs	3 gas flows in DST's; Cormack I-19, Mink Lake I-38, Trout River D-14	Dolomite distribution; fracturing				11275	87	Drummond, 2004	@ Risk		
11) Upper Elk Point – Presqu'ile barrier	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-immature (gas) Conceptual (oil)	Pine Point/Sulphur Point carbonates	Horn River & Muskwa shales	sour gas; oil	Horn River & Muskwa shales; tight Slave Point limestones	shelf edge reefs	1 gas pool in NWT; Rabbit Lake O-16 1 gas pool in Alberta 6 gas flows in DST's in Alberta and BC	Adequate reservoir; top seal		651							
12) Sulphur Point back- barrier shelf	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature	Sulphur Point dolomitic carbonates	organic-rich Muskeg evaporites; Watt Mountain shales	sour gas; oil	Muskeg evaporites; Watt Mountain shales	stratigraphic peritidal channel dolomite bodies; complex antiforms associated with basement horsts; isolated buildups; drape structures over Keg River reefs or	10 non-associated gas pools in NWT (all in Cameron Hills field) 3 oil pools in Alberta; 1 containing solution gas 30 non-associated gas pools in Alberta	Adequate reservoir	0.64	3592	13.45		80	Lee, 1998	Petrimex-discovery process	Total play area; no gas assessment	
13) Slave Point/Sulphur Point barrier reef edge	Northwest Territories; British Columbia	Great Slave Plain	Established-mature (gas) Conceptual (oil)	Slave Point/Sulphur Point/Nahanni carbonates	Horn River & Muskwa shales	sour gas; oil possible	Horn River & Muskwa shales; tight Slave Point & Sulphur Point limestones	shelf edge reefs	4 gas pools in NWT; Nella C-07; South Island River M-41; Trainor Lake C-39; Arrowhead G-69 53 gas pools in BC	Adequate reservoir; dolomite distribution; fracturing		103810		124843	425	Reinson et al., 1993	Petrimex-discovery process	Total play area	
14) Slave Point back- barrier shelf	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature	Slave Point carbonates	Horn River & Muskwa shales	sour gas; oil	Muskeg evaporites, tight Keg River limestones; Horn River shales	complex faulted antiforms; drape structures over buildups or salt solution features; dolomitized isolated reef buildups; reef complexes around Peace River Arch	9 non-associated gas pools in NWT (7 in Cameron Hills field; Grumbler G-63; Tathlina N-18) 1 oil pool in NWT (in Cameron Hills field) 147 oil pools in Alberta; 41 containing solution and/or associated gas 76 non-associated gas pools in Alberta	Adequate reservoir	131.58	56517	162.56	88567	704 (oil); 450 (gas)	Lee, 1998; Reinson et al., 1993	Petrimex-discovery process	Total play area	
15) Slave Point platform	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature (gas) Conceptual (oil)	Slave Point (Presqu'ile) dolomites	Horn River & Muskwa shales	sour gas; oil possible	Horn River & Muskwa shales; tight Slave Point limestones	stratiform lenses; linear trends localized by fracturing resulting from differential compaction	1 gas pool in NWT; Cellibeta H-78 39 gas pools in BC 5 gas pools in Alberta	Adequate reservoir; dolomite distribution; fracturing		26911		79122	450	Reinson et al., 1993	Petrimex-discovery process	Total play area	
16) Kee Scarp reefs (including Ramparts platform)	Northwest Territories	Peel Plain; Anderson Plain	Established-immature (oil) Established-immature (solution gas) Conceptual-(non-associated gas)	Kee Scarp & Ramparts limestones	Canol shale; Bluefish mbr shale	oil; gas	Canol shale	isolated reefs; low relief shoals on Ramparts platform	none	Adequate seal in proximity to outcrop; uneven porosity development; biodegradation of oil				888	1	Osadetz et al., <i>in press</i> (b)	Petrimex-volumetric probability distributions	Peel Plain in Yukon Territory	
17) Jean Marie shelf & shelf margin	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature (gas) Established-immature (oil)	Jean Marie dolomitic limestones	Horn River & Fort Simpson shales	gas; oil	Redknife & Fort Simpson shales; tight Jean Marie limestones	dolomitized and fractured flat biostromal traps; drape structures over underlying shales undergoing differential compaction	1 oil pool in BC; 28 gas pools in BC; 1 gas pool in Alberta	Underpressured reservoirs prone to formation damage; thin pay requires large closures	0.16	32021		35671	300	Reinson et al., 1993	Petrimex-discovery process	Total play area	
18) Upper Devonian Imperial clastics	Northwest Territories; Yukon Territory	Peel Plain; Peel Plateau	Conceptual	Imperial sandstones; Jungle Ridge mbr limestones	carbonaceous material in Imperial; Canol shale Cretaceous shales; Road River shales	gas; oil possible	thick shales within the Imperial Fm	stratigraphic traps in turbidities and shorefaces; possible traps are submarine fans; incised channels on slopes; shelf-margin deltas; structural traps in Peel Plateau; thrust sheet antiforms; drag folds on thrust faults	1 gas flow in DST; Tree River H-38	Adequate charge, reservoir, seal, timing, closure				11942	147	Drummond, 2004	@ Risk	Northwest Territories only	
														15059		11	Osadetz et al., <i>in press</i> (b)	Petrimex-volumetric probability distributions	Total play area; includes Bluesky and Detrital plays
19) Kakisa platform	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-immature (gas)	Kakisa dolomitic limestones	Horn River & Fort Simpson shales	gas	Trout River limestones & shales; Fort Simpson shales	dolomitized shelf edge shoals; platformal biohermal buildups; subcrop traps beneath sub-Cretaceous unconformity	2 gas pools in BC	Adequate reservoir; dolomite distribution		174		3070	29	Drummond, 2004	@ Risk	Northwest Territories only	
20) Upper Devonian/Mississippian Tuttle clastics	Northwest Territories; Yukon Territory	Peel Plateau	Conceptual	Tuttle sandstones	Ford Lake shales; Cretaceous shales; Road River shales	gas; oil possible	Cretaceous Arctic Red Fm; lateral seal from Ford Lake shales	stratigraphic traps in deltaic sediments; subcrop beneath pre-Mesozoic unconformity; large structural closures; thrust sheet antiforms	none	Adequate charge, reservoir, seal, timing, closure									
21) Mississippian subcrop	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature	Debolt, Banfil, Elkton, Pekisko, Rundle, Turner Valley, Shunda Prophet, Flett, & Mattson	Exshaw & Fort St. John Gp shales	gas; oil	Fort St. John Gp shales; Fantásque cherts	subcrop traps beneath sub-Cretaceous unconformity; drapes over underlying features	9 oil pools & 25 non-associated gas pools in BC 346 oil pools in Alberta; 198 containing solution and/or associated gas; 55 are heavy oil	Adequate reservoir, dolomite distribution, seal, source	413.98	512123	940.21	551466	900 (oil); 1100 (gas)	Lee, 1998; Barclay et al., 1997	Petrimex-discovery process	Total play area	
22) Basal Cretaceous clastics	Northwest Territories; Alberta; British Columbia	Great Slave Plain	Established-mature	Chinkeh, Scatter, Sikanni, Bluesky; & Detrital sandstones	Garbutt, Lepine, & Toad-Grayling shales	gas; oil	interbedded Cretaceous shales; tight Flett carbonates for lateral seal	stratigraphic valley-fill and channel-fill sands; shallow marine sandstone pinchouts; entrapments against topography of sub-Cretaceous unconformity	1 gas pool in NWT; Arrowhead B-41 16 oil pools in BC; 7 containing solution and/or associated gas 119 non-associated gas pools in BC	Adequate reservoir; breaching of top seal	47.14	179089	100.34	199058	800 (oil); 1700 (gas)	Drummond, 2004 Lee, 1998; Warters, et al., 1997	@ Risk	Northwest Territories only	
														4.34	6969	32 (oil); 51 (gas)	Drummond, 2004	@ Risk	Northwest Territories only
23) Cretaceous sandstones	Northwest Territories; Yukon Territory	Great Bear Plain; Peel Plain; Peel Plateau	Conceptual	Martin House; Trevor; Little Bear ss	Slater River & Arctic Red shales	gas; oil	interbedded Cretaceous shales	stratigraphic valley-fill and channel-fill sands; shallow marine sandstone pinchouts; entrapments against topography of sub-Cretaceous unconformity	none	Adequate reservoir; breaching of top seal				62644	67	Osadetz et al., <i>in press</i> (b)	Petrimex-volumetric probability distributions	Peel Plain & Peel Plateau in Yukon Territory	
Total endowment – Interior Platform											602.26	1072482	1223.24	1564330					