APPENDIX 3

Geological Description of Alberta Play Areas

These descriptions are meant to be a general guide and not a definitive technical examination of the identified play areas. The reader can refer to any number of technical journals to supplement their interest.

Paskapoo/Edmonton

Area 1: The Edmonton Group and the Scollard Formation are generally interbedded sandstones, siltstones and shales. Reservoirs can exist in multiple sandstones trapped in stratigraphic pinchouts.

Area 2: This area can contain both Edmonton and Paskapoo sandstones with reservoir trapped by stratigraphic pinchouts. The Paskapoo can consist of thick tabular sandstones overlain with interbedded siltstones and shales. The northern limit for gas potential is based on the presence of freshwater in the sands and by proximity to the outcrop edge.

Belly River

Foothills: The entire Belly River section contains sandstones that have potential for structurally trapped hydrocarbons in small triangle zone structures near the leading edge of the disturbed belt. Westward from the leading edge, breaching of the units to the surface reduces any potential.

Area 1(East): The entire Belly River section contains gas-bearing sandstones, most often in the basal section. Deltaic deposits provided for large, multi-section pools while the fluvial sandstones are more discontinuous. Both types of deposits are controlled by stratigraphic pinchouts. The region from T. 28-33, R.1-10 W4M is a transitional zone from the fluvial/deltaic facies to more marine type facies with estuarine channel dominated shorelines. The resulting reservoir quality is poorer than the western region due to nearshore shales. Along the northern flank, gas potential is based on the proximity of the outcrop edge where potential reservoirs are saturated with fresh meteoric waters. The southern region experiences substantial water recharge from the Foremost Formation outcrop.

Area 2 (SW): The western limit of this play area is defined by the eastern edge of the disturbed belt. Faulting close to this edge has likely resulted in a northeastern migration of light hydrocarbons. Typically, oil pools in the central and eastern regions are undersaturated with respect to gas (i.e. small to no gas caps).

Area 3 (NW): This play area is characterized by Wapiti channel sandstones deposited in a mainly fluvial environment. There are also local lacustrine deposits known to exist. Infiltration by meteoric waters makes well log interpretations for gas potential suspect without a valid flow test.

Chinook

Area 1: The play edge is defined by the sand distribution as northwest-southeast trending shoreline sandstones grade laterally into offshore siltstones and shale.

Milk River

Area 1: The northern limit of the play area represents the edge of Milk River sands identifiable on conventional well logs. Northward, unconventional gas potential may exist in the multiple layers of silt-shale deposits. The Milk River tends to become shaly to the west with the western play

edge coinciding with current technologically recoverable gas. The southern edge is controlled by the water recharge system originating at the Milk River outcrop location.

Badheart

Area 1: The Badheart consists of fine grained silty sandstones restricted to a small area of northwestern Alberta. Current discoveries are related to deep underlying Devonian reefs.

Colorado

The Colorado Group is a thick sequence of shale with thin sandstone and conglomerate reservoirs infrequently deposited at various locations.

Area 1: This play contains any sandstone reservoir that occurs in the interbedded sandstone and shale deposits between the Medicine Hat and Second White Speckled Shale Formations only. This area typically has thin reservoirs that are reliant upon localized reworking of the deposits to improve reservoir quality.

Lower Colorado (Other)

Area 1: This play is a composite of all locally developed sandstones found in Colorado Group intervals excluding the Medicine Hat-Second White Specks interval and the basal section (see Basal Colorado). Reservoir improvement is reliant upon local processes.

Medicine Hat

The Medicine Hat play edge is based on a point where the shale volume estimate of approximately 50 percent is derived from well logs. The play area consists primarily of shallow marine sheet sandstones interbedded with shales.

Cardium

Area 1: This play area is located in the disturbed belt bounded by the McConnell and Lewis Thrusts to the west and by the edge of the belt in the east. Cardium reservoirs are generally located in scour channels trending northwest-southeast. Throughout much of the area, the Cardium is absent due to non-deposition, uplift and erosion along with poor structural closure when present.

Area 2: Cardium reservoirs in this area are found in northwest-southeast trending bar sandstones and large marine sheet sandstones. Reservoir development is based on stratigraphic trapping. Adjacent to the disturbed belt, the Cardium can be locally fault-controlled and may have some stacked sandstone deposits.

Area 3: Isolated clastic reservoirs are located in shallow shelf to offshore environments. Clastic development is restricted and laterally grades quickly into shale. This area is affected by fresh water recharge from the northern subcrop.

Doe Creek

Area 1: Shallow marine sheet sandstones and northwest-southeast trending bar sandstones grade laterally into marine shales marking the edge of the play area. Multiple sandstone deposits may be encountered locally.

Dunvegan

Area 1: This is an overall deltaic environment represented by shallow bar and sheet sandstones. The play area is defined by a lateral grading of sands to marine shales. A fairway of stratigraphic traps is oriented northeast-southwest.

Area 2: Deltaic channel sandstone sequences oriented northwest-southeast form the primary reservoir. Local discontinuities within the sequences create the stratigraphic traps.

Second White Specks

Area 1: The Sweetgrass Arch influenced shoaling on a storm-dominated shelf that resulted in deposition of coarser and cleaner sands in this area.

Area 2: The primary reservoirs are fractured shales caused by volume reduction as water was expelled from clays by tectonic forces related to the Cordilleran development. The play area is identified to the east where the easternmost oil-bearing reservoirs occur and limited by the disturbed belt to the west.

Area 3: This area is primarily a marine shelf environment with scattered reservoirs occurring in locally improved sandy regions.

Base of Fish Scales

Area 1: This area is characterized by locally developed, thin, finely laminated sand deposits within a highly organic siltstone and shale sequence. Reservoir quality facies are scattered throughout the area.

Area 2: The Barons sand, a shoreline sandstone facies, is the dominant reservoir in this area. The facies laterally grades into tighter interbedded silt and marine shale forming the stratigraphic trap. There is some structural relief allowing the gas to migrate eastward from the oil in the same facies. The play area is subdivided into oil and gas prone areas.

Viking

Foothills: As with the Belly River, the Viking sandstones hold hydrocarbons in structurally controlled traps near the leading edge of the disturbed belt in the Triangle zone play.

Area 1: A number of bar sandstones generally trend northwest-southeast and develop as the primary reservoirs.

Area 2: This area is characterized by extensive thin sheet sandstones throughout the area. Reservoir quality deteriorates to the northeast due to increasing shale content.

Area 3: The area is noted for stacked bar sandstone sequences (Bow Island Formation) along with interbar sheet sandstones. Well log analysis is complicated by the presence of fresh water.

Area 4: The Cadotte Formation is a prograding barrier bar complex with tidal and estuarine channels. The overlying bar sandstones of the Paddy Formation are more areally restricted.

Area 5: This area is dominated by marine bar sandstone development that trends northwest-southeast.

Basal Colorado

Area 1: The play consists only of basal clastic sediments deposited in the Colorado Group. The play area is identified by the presence of northwest-southeast trending bar sandstones. The play area's edge is determined by the sandstone facies depositional limit.

Mannville Above Glauconitic Interval

Area 1: This area is composed of nearshore, deltaic and continental deposits that are laterally restricted. The southern region is characterized with nomenclature of the Lloydminster area (Colony, McLaren, Waseca, Sparky, General Petroleum, Rex and Lloydminster Formations) while the northern region is generally assigned to the Grand Rapids or Clearwater Formations. Channel and bar sandstones are the typical facies found as reservoir quality traps.

Area 2: The area consists of undifferentiated sandstones that are widespread but not laterally extensive as individual reservoirs. These sandstones have been deposited in a variety of fluvial environments. The occurrence of coal deposits also tend to be widespread.

Area 3: This play area is subdivided into Spirit River Group and Falher Formation. The Falher Formation in this area is a series of prograding beach sandstone facies within a high energy wave-dominated shoreline environment. Multiple reservoir layers can be encountered within a single well. The Deep Basin region in the southwest is known to have trapped gas downdip of water-prone reservoirs. The overlying Notikewin Formation developed in a moderate energy prograding barrier island and deltaic environment. The underlying Wilrich Formation is predominately a shale deposit with some interbedded sandstones. The Sprit River Group captures gas pools in the undifferentiated Wilrich, Falher and Notikewin equivalent sandstones.

Glauconitic Interval

Area 1: This area has Glauconitic fluvial, estuarine channel and delta front sandstones deposited in a prograding sequence over the Ostracod Basin. Combinations of stratigraphic and structural traps allow the reservoirs to develop in stacked or isolated pools. Thick sinuous channels are common and can be shale or sand filled.

Area 2: The Glauconitic, Cummings and Wabiskaw Formations in this area typically have only one productive sandstone reservoir developed in a marine bar environment.

Area 3: The Bluesky Formation consists of reworked shallow marine bar sandstones as a result of transgressive events. There is a transitional boundary between Areas 2 and 3.

Area 4: Extensive barrier bar complexes of the Bluesky Formation are located north of the shallow marine sediments. However, these sandstones do shale out rapidly to the northeast. Well log analyses indicate increased shale volumes as compared to more southern deposits.

Ostracod

Area 1: Basal shale and limestone beds were deposited in various marine and coastal (brackish bay) environments. Highland regions to the northeast and a transition to an open marine environment to the northwest limited the extent of the Ostracod Formation. The northernmost boundary is an assumed limit where sands to the northwest are captured in the Gething Formation. Along the eastern flank, continental sediments associated with lacustrine and fluvial environments can be found.

Ellerslie

Area 1: This area is characterized by alluvial deposits in a continental plain environment. Stratigraphic trapping is the primary mechanism although structural traps can be significant in local regions. Multiple sandstones within a single well can be expected.

Area 2: The McMurray Formation is identified by high porosity, high permeability, poorly consolidated sandstones deposited in a fluvio-deltaic environment.

Area 3: The Gething Formation is a thick deposit of continental and deltaic sediments influenced by major river channels that not only provided a sediment source but affected sedimentation patterns.

Cadomin

Area 1: This foothills area has three significant alluvial fan deposits within the disturbed belt region. The coarse sandstones and conglomerates generally have reduced porosity caused by burial compaction and by silicification. A structural relationship exists between the Cadomin and the underlying Mississippian sediments that have been thrust upward.

Area 2: This area is bounded to the east by the +100 metre Fox Creek Escarpment, to the south by facies transition to shaly sandstones and westward by alluvial plain facies. Sediments from the alluvial plain were moved through the Spirit River channel system and deposited as well sorted conglomerates and sandstones in the eastern braided river side of the bifurcated Spirit River Channel.

Area 3: The Cadomin here consists of conglomerates deposited proximal to the medial braided river facies in the westward side of the bifurcated Spirit River Channel. The eastward extent of this facies is controlled by an interior alluvial plain.

Nikanassin

Area 1: This foothills area has two regions that are shown to have structurally controlled distributary channel sandstones. Similar to the Cadomin Formation, reservoir quality is dictated by burial and silicification.

Area 2: Poorly developed stream channel sandstones were deposited in the more distal reaches of the channel system. Increased amounts of lithic fragments and clays significantly reduced reservoir quality.

Area 3: The area is characterized by well developed sandstones deposited within a braided channel system. The play area's limit is controlled by the increased impact of a marine environment.

Rock Creek

Area 1: This area consists of marine bar and sheet sandstones of the Swift Formation and shoreline and shallow marine shelf sandstones of the Sawtooth Formation eastward of the Sweetgrass Arch.

Area 2: The area contains the marine shelf sandstones of the Sawtooth Formation west of the Sweetgrass Arch while the Cut Bank Valley truncates the shelf deposits further west.

Area 3: The Swift and Sawtooth reservoirs are fine grained sandstones and siltstones deposited in a deeper marine environment. The post-depositional Cut Bank Valley forms the eastern play

boundary. The northern limit of the area is determined by nomenclature change to the Rock Creek Member.

Area 4: The Rock Creek consists of sheet sandstones deposited in a marine shelf environment. A depositional low to the north separates this area from the more northern area. Sediment truncation by erosion and non-deposition sets the eastern boundary.

Area 5: The Rock Creek is composed of sheet sandstones but is isolated from Area 4 by the depositional low infilled by Fernie shales.

Nordegg

Area 1: This foothills area is based on local occurrences of fine sandstone lenses and siltstones in a thick shale facies deposited in a deep marine environment. Structural closure is related to underlying Mississippian structures. There is some question as to whether the gas in this pools is actually Turner Valley gas escaping through a fracture system.

Area 2: Local deposition and sporadic porosity development of siltstones and limestone within deposits of phosphatic shales are unpredictable. A facies change to shoreface sandstones eastward and a northern transition to shale limit the area.

Area 3: The main reservoir facies is chert-rich, shoreline sandstone limited by the erosional edge on the east flank.

Area 4: This area is generally considered a marine basin environment with phosphatic shales, siltstone and detrital sandstones. Porosity development in thin zones is unpredictable and so far sporadic.

Baldonnel

Area 1: The Baldonnel Formation contains extensively leached bioclastic sediments that have been dolomitized. The subcrop edge requires additional delineation to establish a definitive limit.

Charlie Lake

Area 1: A number of thin dolomite members deposited in a sabkha environment have been found to contain localized stratigraphic traps. Along the area's edge, pre-Jurassic erosion may enhance reservoir quality. There is a developing play in the northern foothills.

Boundary Lake

Area 1: The Boundary Lake Member consists of tidal flat and lagoonal limestone and dolomites. Stratigraphic facies change and subtle structure control provides a trap mechanism. Play area boundary is well established by drilling and there is very limited room for further growth.

Halfway

Area 1: A combination of longshore bars, barrier islands and tidal channel deposits have developed in this area. A variety of facies can range from sand to silt to coquina. Structural and stratigraphic traps with facies change to finer sandstones and siltstones form the seals.

Doig

Area 1: The Doig contains a basal phosphate zone that grades into a clastic sequence as a result of a tidal bar shoreline environment becoming dominant. Sandstones developed from nearshore and shoreline sandy deposits or tidal scoured submarine channels can exist.

Montney

Area 1: This foothills area relies on dolomitized coquina sandstones for reservoir development along with structural closure. Coquinas were sourced from the north and this play has a very limited areal extent.

Area 2: The area is defined by shoreline sandstones and dolomitized coquina deposits. In the southern region, reservoirs exhibit leached coquinas with moldic porosity. Farther north, primary and secondary vuggy porosity can develop in the coquinas while sandstones become the preferred reservoir facies.

Kiskatinaw/Taylor Flat

Area 1: A sequence of Kiskatinaw sandstones and Taylor Flat bioclastic carbonates form a number of reservoirs. Silty sandstone reservoirs in the Golata shale sequence are also included here. Graben complexes associated with Peace River Arch tectonics increase the complexity of the trap mechanisms. Multiple reservoirs may be encountered in a single well.

Belloy

Area 1: The area is characterized by shoreline sandstones fringing around a marine shelf siliclastic dolostone assemblage. Structural control is needed to form traps except along the erosional edge where facies change can form the seal. A foothills play is developing to the south of the main play area.

Turner Valley

Area 1: The foothills area developed in a protected shelf to inner marine shelf environment that allowed thick succession of limestones to be deposited. Subsequent dolomitization and post-depositional thrust faulting provide reservoir development. The Mount Head dolomitic limestones and southern Livingston crinoidal limestones also contribute reservoir development in this area.

Area 2: The original marine shelf limestones have undergone significant dolomitization and erosion as uplift occurred in the central and northern regions of the area. The Elkton Member is typically a crystalline dolomite and limestone found along the erosional edge and form the primary reservoir facies. Backstepping from the edge and to the south, a facies change to a dense, hard, laminated silty dolomite limits reservoir development.

Area 3: This area contains the Livingstone crinoidal limestones with some interbedded dolomitic limestone. Secondary porosity resulting from erosion and sub-aerial exposure improves the reservoir quality along the erosional edge. Structural drape in the south creates the trap mechanism for limited reservoir development.

Area 4: The Debolt limestone and dolomite assemblage is fairly consistent in the area. Post-depositional basement faulting result in fracturing that is associated with Peace River Arch horst and graben structures to enhance reservoir development.

Area 5: This area is restricted to the erosional edge as facies change to a more dense Debolt carbonate assemblage to the west.

Area 6: This area is the broad regional limestone deposits with less common dolomite and anhydrite, with pools formed by basement structuring around Play Area 4 where the larger horst and graben structures are found.

Shunda

Area 1: An open marine environment provided stable conditions to deposit mixed carbonates in the north. To the south, a restricted to open marine environment allowed for siliclastics, evaporites and carbonates to intermix.

Area 2: This area is primarily interbedded mixed carbonates and shales that grade into siliclastics northward. Post-depositional exposure along the subcrop has created improved reservoir quality.

Area 3: A facies change to shallow shelf siliclastics separates this area from Area 2.

Post-depositional processes have significantly reduced the primary porosity along the erosional edge.

Pekisko

Foothills: This area contains a clean limestone and dolomite sequence that is readily identifiable on well logs. Post-depositional thrust faulting has created structural traps suitable for reservoir development. The potential for additional pools in this play is limited to the western edge of the disturbed belt near the Limestone and Burnt Timber structures.

Area 2: Post-depositional diagenetic processes controlled reservoir development as sub-aerial exposure of crinoidal limestone occurred. Stratigraphic traps were formed as Mesozoic shale draped over outliers or capped the main erosional surface. Back of the subcrop, a dense Shunda carbonate can be the top seal.

Area 3: Post-depositional diagenetic processes limit reservoir development by altering the primary porosity in the crinoidal limestone. Drape over by Jurassic and Cretaceous shale provides the seal for reservoir development. The Livingstone carbonates form the back edge of the area.

Area 4: Marine platform carbonates back of the subcrop show sufficient local porosity enhancement to develop reservoirs. Diagenetic processes have had limited opportunities to evolve due to the overlying burden.

Area 5: This area is the northern continuation of the subcrop play although the facies changes to a more argillaceous carbonate.

Banff

Area 1: Marine platform carbonates downdip of the subcrop edge form reservoirs as drape over paleotopographic highs, local fracturing and faulting from basement tectonic activity create small targets.

Area 2: Marine shelf carbonates transition eastward into Bakken sandstones and siltstones. Unconformity or stratigraphic traps are the dominant reservoir types.

Area 3: This area is limited to the subcrop edge and is characterized by marine shelf dolomitized carbonates of the middle Banff unit (locally may be called the Clarke's Member). Reservoirs are developed as unconformity traps in paleo-topographic highs that are often in communication with Jurassic sediments.

Area 4: A mixed assemblage of clastics and carbonates form the subcrop. The middle Banff is primarily marine shelf carbonates with sporadic improved porosity. The upper Banff has facies variation to clastics and is capped by Mesozoic shale. Poor preservation of the clastic facies impacts on reservoir development.

Bakken

Area 1: Reservoir development typically occurs where quartzose sandstones are preserved. Laterally rapid grading into finer sands, silts and shale restrict any stratigraphic traps.

Wabamun

Area 1: This foothills area contains marine shelf dolomite and limestone. Minor primary porosity is enhanced with fracture related permeability created by thrust faulting. The southern half of the area contains the best reservoir development.

Area 2: The Crossfield Member consists of dolomitized stromatoporoid mounds encased in supra- to intertidal evaporites.

Area 3: This area is defined by marine shelf carbonates deposited over and subsequently deformed by drape over the underlying Leduc Rimbey-Meadowbrook reef chain.

Area 4: This subcrop area is a marine shelf carbonate complex dolomitized by post-depositional processes. In the north, the area is restricted to depths greater than 300 metres due to inadequate overburden sealing. The main subcrop edge is subdivided based on trends in the proven pool development. As well, there are a series of erosional outliers in front of the subcrop edge.

Area 5 and 5A: Silty siliclastics and marls are found around the crest of the Peace River Arch along with a dolomite facies. Subsequent extensional faulting controls reservoir development. The Gold Creek area (5A) has undergone similar geological processes.

Area 6: The area contains inner shelf fine crystalline dolomite that grades laterally eastward into an anhydrite facies as a more restricted and shallower marine environment evolved.

Area 7: This inner shelf environment is represented by bioturbated to open-marine limestones. A stable tectonic situation kept reservoir development at a minimum.

Area 8: The Obed-Windfall complex contains marine shelf carbonates that have reservoir development initially caused by structural drape deformation over the underlying Leduc reef chain.

Area 9: Most reservoir development is a result of hydrothermal, magnesium-rich dolomitizing fluids rising along fault lines altering the original patch reef limestones. The Tangent-Normandville region has northwest trending extension faults combined with northeast-southwest trending transverse faults.

Nisku

Area 1: Reservoir development resulted where dolomitized tabular stromatoporoids and coral bioherms draped over the Leduc Bashaw-Clive-Wimborne reef chain. There are some fault-bounded structures in the foothills associated with this play type.

Area 2: A restricted shelf interior of salinas and mudflat environment provided a mix of unfossiliferous dolomite (the Arcs Member) and evaporites. Underlying salt dissolution and collapse allowed for structural reservoir development in several regions.

Area 3: This subcrop area follows the Nisku shelf dolomite along with the Camrose shallow shelf dolomite. Where the sediments are shallower than 300 metres, reservoir development likely is poor due to seal loss. As with the Wabamun, there are a number of erosional outliers in front of the main subcrop that are productive for gas.

Area 4: A combination of patch and pinnacle reefs along with shelf bank carbonates follow the southern Lobstick Shelf Edge around to the northwest trending Meekwap Shelf Edge.

Area 5: Shallow water carbonates along with a shoaling facies (Blueridge Member) were deposited. Reservoir development tends to occur along the fringe imprint of the underlying Leduc reef complexes.

Area 6: Several sub-areas have been combined where platform and shelf carbonates have sporadic reservoir development which has not been influenced by underlying or adjacent geological events.

Area 7: The southern and northern Cynthia basins contain interbedded shale and ramp limestone. Small isolated reefs continued to build at opportune locations.

Area 8: This area follows the underlying Leduc Rimbey-Meadowbrook reef chain as dolomitized tabular stromatoporoids and coral bioherms draped over the reefs in a shoal type environment.

Area 9: Reservoir development resulted where dolomitized tabular stromatoporoids and coral bioherms draped over the Leduc Meadowbrook-Rimbey reef chain.

Area 10: A combination of patch and pinnacle reefs found in the West Pembina play area only.

Jean Marie

Area 1: The Jean Marie is a fine grained, low porosity carbonate shelf deposit. The Alberta portion is landward of the main carbonate bank edge in British Columbia and the play subcrops east of the Rainbow area.

Leduc/Grosmont

Area 1: The Bashaw-Clive-Stettler region is defined by larger dolomitized reef complexes with adjacent smaller isolated reefs that are occasionally undolomitized built on the undolomitized Cooking Lake Platform. The Killiam Barrier Reef is heavily dolomitized as it extends to the northeast with reservoir development likely adjacent to shale filled tidal channels.

Area 2: The Rimbey-Meadowbrook trend is defined by larger dolomitized reef complexes with adjacent smaller isolated reefs. The extensively dolomitized Cooking Lake Platform's edge defines the area's boundary.

Area 3: There are three types of carbonate buildups fringing the Peace River Arch in this area - large reef complexes surrounding lagoonal sediments, pinnacle reefs in embayments between the large complexes and deeper water bioherms on the seaward side of the complexes. Again, the undolomitized Cooking Lake Platform defines the area's boundary. Reservoir development in the larger reef complexes is aided by depositional variability and erosional irregularities.

Area 4: The northern region is identified by interbedded dolomite and sandstones with the dolomite becoming dominant as the play extends southwest. Post-depositional dolomitization is theorized to be influenced by fluid flow resulting from tectonic movement of the Peace River Arch and deep basement faulting.

Area 5: The lower Grosmont is generally fossiliferous limestone as the Duvernay shales isolated the carbonates from any dolomitization process. The upper Grosmont tends to be well dolomitized as post-depositional processes provided exposure to geochemical activity.

Area 6: The area is defined by larger Leduc dolomitized reef complexes with adjacent smaller isolated reefs. The extensively dolomitized Cooking Lake Platform's edge defines the area's boundary.

Area 7: This area is defined by larger Leduc dolomitized reef complexes with some smaller isolated reefs. This is a northeast segment of the Rimbey-Meadowbrook trend (House Reef) located in Townships 93 to 96, Ranges 18 to 19 W4M.

Area 8: The Cooking Lake Formation developed as an extensive shelf in a shallow marine environment. The shelf is mainly composed of undolomitized peloidal and skeletal limestone.

Several shows and some minor oil production indicate some potential, but there are no established pools to date.

Swan Hills/Slave Point

Area 1: This area has two major depositional environments. In the southern region, a bank or shelf edge has developed as the Swan Hills reef complexes backstepped onto the West Alberta Ridge. The more northern reef complexes were built on a carbonate platform and follow bank margins restricted by narrow embayments. Reservoir development is due to facies change and dolomitization in many of the reefs.

Area 2: Large platform reefs form extensive complexes with small patch reefs occurring between the complexes. The Swan Hills facies has stayed as primarily limestone.

Area 3: Slave Point carbonate shelf deposits backstepped onto the Peace River Arch likely as eustatic sea level changes occurred as two cycles of bank margins were developed. Subsequent dolomitizing fluid flow off the Arch resulted in reservoir development.

Area 4: This area is characterized by cyclical Slave Point carbonate shelf facies that backstepped towards the Peace River Arch as eustatic sea level changed.

Area 5: The Slave Point Formation was developed as patch reefs in an interior shelf environment. Reservoir development is sporadic as porosity is inconsistent and unpredictable.

Area 6: This area is characterized by Slave Point carbonates developing over underlying pinnacle reefs.

Area 7: This area's Swan Hills reef complexes follow a northwest-southeast trending bank margin in the Ante Creek region.

Area 8: The Swan Hills reef complex is separated from the more northern equivalent play area by an embayment into the West Alberta Ridge. Reservoir development is due to facies change and dolomitization.

Sulphur Point

Area 1: This fossiliferous limestone was deposited in a semi-restricted marine shelf environment. Reservoir development is a result of drape over the underlying pinnacle reefs in the Rainbow, Shekilie and Zama Basins.

Area 2: This area is characterized by fossiliferous limestone deposited in a bank or shelf environment east of the Rainbow, Shekilie and Zama Basin regions. These carbonates transition to shale further eastward.

Keg River

Area 1: The Keg River in this area is characterized by coarse grained sandstones made of up freshly eroded granitic material shed from the Peace River Arch in a nearshore environment.

Area 2: This area consists of carbonate mudstone and patch reefs deposited on a shelf margin or in a slightly deeper marine environment.

Area 4: The Keg River Formation is mimicked by draping of the overlying Zama and Muskeg Formations. These formations are characterized by a complex of patch and pinnacle reefs in the Keg River and thin Zama and Muskeg dolomitized carbonates set in a restricted marine to evaporitic environment.

Area 5: This area is defined by Keg River patch reefs deposited in a marine shelf environment.

Gilwood/Granite Wash

Area 1: The Gilwood Member and Granite Wash consist of arkosic, quartz and/or feldspathic sandstones and conglomerates. The Granite Wash is directly deposited on the Precambrian surface while the Gilwood may be identified lying on top of non-clastic sediments except where the sandstones backstep higher up on the Peace River Arch.

Area 2: This area contains Gilwood and Granite Wash sandstones that are generally finer grained than those deposited to the west.

Area 3: The Gilwood Member and Granite Wash consist of arkosic, quartz and/or feldspathic sandstones and conglomerates shed off of the Athabasca Arch which trend northeast-southwest between the Peace River Arch and the outcrop in northeastern Alberta.