

## READING THE ENTRAILS: AN ALBERTA ECOHISTORY

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## OIL MOIL

## THE WAY IT WAS



What to do with it—perhaps caulk and seal canoes? A Cree named Wa-Pa-Su (also known as Swan) noted a strange black pitch, bitumen, in his reports to the HBC. Might it have value one day? For two centuries little would come of this mention of a northern Alberta riverbank seeping black guck, but Wa-Pa-Su's 1719 notes on the Athabasca Tar sands is Alberta's first written record of fossil fuels.

Palliser noticed coal exposed by cutbanks in Alberta river valleys. In 1870 an American, Nicholas Sheran, spied coal seams along the Oldman River near present-day Lethbridge. By 1872 he had bored his coal mine deep into the bank. Knowing better than anyone that the CPR was coming and it needed coal, Alexander Galt (father of Confederation, railwayman, entrepreneur and insider with the highest imperial contacts) arranged the 1882 takeover of the Sheran Mine through a company headed by one William Lethbridge. This coal would fuel the westward-probing CPR.

Just when Palliser ended his sortie into the western wilds, 1859, the first North American oil wells were dug and drilled. Many produced light gravity oils that transported safely and easily, making them splendid fuels for an automated and mobile age. In 1876 Otto cranked up his internal combustion engine, a prototype for a next generation of power plants. This engine required safe portable fuels like petroleum-based gasolines for its mobile applications. With automotive civilization welling up, any place promising oil held promise.

Around that time, 1874, Stoney people told bison hunter, wolfer, trader and first White resident of Waterton Lakes, Kootenai Brown, of extrudes seeping into Cameron Creek above Upper Waterton Lake. The Stoney used this viscous liquid as a lubricant, ointment and unction—so did Brown. Years following, after hearing Brown's stories, a string of promoters and would-be oilmen (1889-91 and then from 1902-1907) tried their luck with "black gold" at a drilling settlement called Oil City in what is now

Waterton Lakes National Park. A few wells produced and one, the Western Oil Company well, blew wild, oozing slick into Waterton Lakes. "There it spread out, killing thousands of ducks and fish," according to Ed Gould's book *Oil*.<sup>1</sup> For good and for bad Alberta had oil. In time it would be found in abundance.

Oil City cameoed Alberta's conventional oil development, a life cycle now only half played out. Itinerant explorers strike oil. They capture and produce this non-renewable resource. Others circle in, clamouring for their piece. The field is produced to depletion. Oilmen lower their derrick and tent poles to move on, taking what still has value and leaving behind roadways, disturbances, castoffs, pollution and introduced exotics. The Oil City play dried up by 1910 and the buildings started their long decay.

While laying the railway line near Medicine Hat in 1883, CPR poked under the parched prairies seeking water. It hit ubiquitous natural gas. By 1890, with "all hell for a basement" as Rudyard Kipling said, Medicine Hat harnessed this fiery devil to their purposes. Neighbours warmed to natural gas. Promoters did too, hustling deals up and down the railway line—some went so far as to drill wells. In 1909, near Bow Island, an 8 million cubic feet per day gas well came in.<sup>2</sup> This well, Old Glory, and others from nearby CPR lands produced enough gas to pipeline it to Calgary, Lethbridge and other consumer points along the way.

Near present-day Turner Valley, a rancher noticed strange substances bubbling up along the creek bank. Sensing opportunity, William Herron leased the surrounding lands. He and others, including a surge of lawyers (later to form a core group of Alberta's elite and one, R. B. Bennett, a future Prime Minister of Canada), drilled the Dingman Discovery well, hitting a rich production zone of naphtha on May 14, 1914. A brief orgy of petroleum field flim-flams followed this first boom in what was then known as Turner's Valley.<sup>3</sup> Within months of Dingman No. 1, a young Bosnian assassinated the Austro-Hungarian Archduke Francis Ferdinand (June 28, 1914). Europe ignited in war, inflaming the world with them. Canada joined in August 4, 1914 and Turner Valley turned to fuelling the war effort.

Turner Valley did not gush again until October 14, 1924 when Royaltite No.4 blew in, out, and, later, up. Catching fire on November 9, this rogue well incandesced night skies kilometres distant. The drama of the event and the magnitude of the discovery reignited speculation. Hucksters and hustlers once again hit the streets of Calgary. This time the puff turned to reality. Significant oil and gas reserves lay beneath Turner Valley.

In 1936 drillers finally tapped into Turner Valley's deeper basins of crude oil and again the valley went development wild. Gould recounts:



Pumping stations, absorption plants, tank farms and derricks dotted the foothills. But the most noticeable feature was the flares, hundreds of them, all over the Valley, making so much light that the glow could easily be seen from Calgary, 40 miles, (64 km) to the northeast.

The author . . . could count as many as 14 huge flares from the front door of one family home near Longview. Dubbed Hell's Half Acre, the flares caused unnatural flower and grass growth in the areas around them and farmers swore they could read their newspapers from a long distance away and go hunting rabbits at night without further illumination.<sup>4</sup>

A glorious foothills valley deliquesced into a sickly industrial site. Pollution settled over Little Chicago and Little Philadelphia, names pretentious boosters pinned on the valley's precocious clapboard towns. Over a trillion cubic feet of gas was flared, hazing the atmosphere with shades of sickly browns and sulphurous yellows. Underlying streams bubbled viscously with kindred colours.

Later the field lost pressure, production declined and the boom fizzled. Transient exploiters drifted off but the mess stayed behind. The puffy towns of Little Chicago, Little New York and Little Philadelphia lost their boom and bluster. The only survivors, Little New York, now known as Longview, and Turner Valley itself, still have people, the others only weeds and ghosts.

Alberta's "eureka!" was February 13, 1947, its world oil debut. That day Imperial Oil's Leduc No. 1 blew in, the discovery well to a field containing over 200 million barrels of recoverable oil. Here was a land with oil and a government with ambition to exploit it. The remainder of the Seven Sisters<sup>5</sup> and lesser multinational oil companies followed Exxon (Imperial Oil's American Parent) to Alberta. The industry quickly found Alberta's elephants, including the expansive Pembina field southwest of Edmonton and Rainbow Lake-Zama. From Texas and Oklahoma, wherever local prospects paled, seekers journeyed to this new Promised Land to drill for black gold, to strike it big, to cash in, and to move on.

Gould claims, with merit, that the big oil discoveries multiplied local growth:

This increase in oil and gas production affected every person on the Prairies by widening the job opportunities through new industries and increasing construction and strengthening of public finances. Farm mechanization was speeded up, provincial debt was lowered and cities like Regina, Calgary and Edmonton doubled their populations.<sup>6</sup>



Unlike the settlers detraining from the CPR decades earlier, the new settlers came by car, bus, and plane and shared one overwhelming focus—to enrich on black gold. Gould also described the early oilfield worker's circumstances:

"You could always tell an oil worker's house," the man said. "It may have been only a tarpaper skid shack, but there was always a brand new car sitting outside it." "And an outside toilet too," his wife added.<sup>7</sup>

## RECENT HISTORY

With Leduc No. 1, Interprovincial Pipeline started to lay pipe east, penetrating Manitoba in 1949, Sarnia by 1953, and then on to Toronto. But Alberta's expensive oil could not compete in the eastern market with more inexpensive offshore oils. Oft-forgotten out west these days was Canada's accommodations to Alberta and its newest industry. Based on recommendations of the Royal Commission on Energy, the Borden Commission, struck in 1957 to inquire into energy issues, the federal government of John Diefenbaker implemented its National Oil Policy (NOP) on February 1, 1961. Industry obtained a monopoly over markets west of the Quebec-Ontario border, all under the nurturing regulatory eye of the new National Energy Board (NEB). Ontario energy consumers paid significantly higher prices to support Alberta's petroleum producers and government. Protected from world prices, marketplace competition, and free trade, the mostly American multinationals got down to the business of finding and selling pricey Alberta oil.

These mercantilist policies were not potent enough for some in the industry. In his *The Blue-Eyed Sheiks* Peter Foster recalls the Independent Producers Association of Canada (IPAC) pithy plea to Ottawa in 1969:

Canada is the only nation capable of self-sufficiency which gives only limited priority to domestic oil; permits a drain of hundreds of millions of dollars for overseas oil; leaves half the nation totally dependent on overseas supplies, thus ignoring the problem of security in emergencies; and leaves it to another nation—the United States—to provide the lion's share of market growth for a Canadian resource.<sup>8</sup>

Entreaties for government intervention turned to "butt out" when world prices headed higher several years later.



In 1971 the Organization of Petroleum Exporting Countries (OPEC) cartel constricted oil supply, driving world oil prices up. By the mid-'70s world oil prices quadrupled and after 1979, virtually quadrupled again—all told from US\$2 to US\$40. With the OPEC epiphany, the oilpatch gospel now praised free markets and “world oil prices.” Suspicious of provincialists and fair-weather free-enterprisers, Pierre Trudeau’s federal government imposed its National Energy Plan (NEP), a plan that required the industry, producing and consuming provinces (east and west), and the federal government to share benefits and burdens of OPEC’s manipulations. IPAC got some of the measures (now thoroughly despised) so eagerly prayed for in its 1969 submission. Alberta’s premier, Peter Lougheed, fought the NEP by threatening to twist closed his fossil fuel tap to the east. Suddenly sharing, security and nation building were the devil’s work. About then the epithet “Freeze in the dark, you eastern bastards” circulated.

Brian Mulroney’s federal government eliminated Trudeau’s hated NEP. Through the Western Accord, entered with the producing provinces in March 1985, oil moved to world prices; gas would follow shortly. To ensure that the public interest not interfere with business, Mulroney’s people equated the public interest to the private interests of those buying and selling the resource. This doctrinal prestidigitation they called Market-Based Procedures for gas. It is “founded on the premise that the marketplace would generally operate in such a way that Canadian requirements for natural gas would be met at fair market prices.”<sup>9</sup> Similar principles applied to oil. Mulroney’s market magic gutted the public and national interest.

Mr. Mulroney did not rest there. With daring he moved Canada into a sovereignty netherworld with Article 9.04 of the Canada/United States Free Trade Agreement (FTA):

Either party may maintain or introduce a restriction . . . with respect to the export of an energy good . . . only if:

- a. The restriction does not reduce the proportion of the total export shipments . . . relative to the total supply of that good . . . as compared to the proportion prevailing in the most recent 36-month period . . . measure.

FTA’s super-sovereign covenants provided the Americans rights to that proportion of Canadian production they enjoyed over the previous three years. Cold Canada pen-stroked away rights to 55% of its natural gas and 45% of its oil (in today’s proportions). Trade metamorphosed from discretionary to mandatory.<sup>10</sup> Now national interest was not just an irrelevant interest, but an excluded interest. Like the *Enclosures Acts* centuries



earlier in England and the Indian treaties of last century, people were excluded from the benefits of the land.

## INDUSTRY PRACTICES

Finding and capturing substances enfolded in formations thousands of metres and millions of years below Earth's surface is no facile quest. For Oil City, Old Glory and Turner Valley, discoveries seemed as much luck as method. The rustic ways of finding oil—surface observations, intuition and divining techniques—gave way so that after Leduc the majors pursued petroleum with scientific precision, technological power and businesslike discipline, all applied with hound-dog determination.

Seismics, a favoured geophysical information gathering tool in fossil fuel prospecting, involves the detonation of small explosive devices, set at certain distances along surveyed, cleared lines. Deep-earth echoes rebound and are recorded by sensitive devices placed in matrix across the targeted area. Seismic records indicate critical features to subterranean geological formations and their potential for hydrocarbons. Seismic's millions of kilometres of cut and cleared rights-of-way (five million kilometres by one estimate) criss-cross the province.

Desirable lands are obtained from government and private interests, often through "farm-in" arrangements. Roads are rammed to a drilling location, sometimes miles distant over challenging terrain, up mountains, across scree slopes or through muskeg or swamp in the Green Area. Over 500,000 km of petroleum access roads slice Alberta.<sup>11</sup> At roadend contractors clear and level a hectare or larger drilling site and excavate a sump as repository for perhaps 25,000 barrels of drilling wastes, and a flare pit to dispose of bad gas and other pollutants into the atmospheric commons.

A drilling tower, mobile buildings and large equipment are deployed to the lease site with military precision, transforming it into an industrial site. The tower structure and platform enable the bit-tipped steel stem to drill ever deeper into the earth. Crews sheath the hole with metal casings to protect it from cave-ins and prevent the entry or escape of materials. Mudmen circulate various materials throughout the hole, to lubricate drilling, regulate temperature and downhole chemistry, and suspend out solids. Periodic pressure, mechanical and chemical tests indicate characteristics downhole and productivity potential of zones. If successful, the well is completed as a producing well. If not, it is cased, cemented and abandoned.

Secondary and tertiary recovery methods increase a well or field's total recovery. Techniques include water floods where injectors pressure-drive large volumes of water through the production zone in a subterranean



flood, driving oil to capture wells. Other treatments include carbon dioxide injection, acid treatments, hydraulics, steam and subsurface explosives. To date about 200,000 fossil fuel wells have been drilled in Alberta.

Production flows up the well bore, then through the field gathering system to the battery installation. A battery is a central collection, processing, stripping and measuring plant that prepares the hydrocarbons for further processing and pipelining. About 13,000 oil batteries, 3,200 gas batteries and 1,300 gas plants are out there.<sup>12</sup> An estimated 400,000 km of power lines have been strung in the upstream oil effort. Pipelines are laid in trenches excavated in a right of way, a 5-metre width cleared of vegetation. Fences, gates, bridges, tunnels and special facilities such as compressor and pumping stations are required along the line. Alberta's interconnected grid comprises over 260,000 km of pipelines, all dedicated to taking oil and gas off to processing plants, refining and market.

## BITUMEN

Over millions of years, long subterranean migrations brought heavy oils called "bitumen" to or near the surface in great pools in Alberta's north and east, pools such as the Athabasca Tar Sands (the largest), Cold Lake, Wabasca and Peace River. Together these comprise some 4 or 5,000 km<sup>2</sup> or 6.5% of Alberta.<sup>13</sup> Estimated recoverable resources are colossal. Wa-Pa-Su spotted these bituminous deposits in his 1719 travels.

Science and technology have examined everything from chemical baths, hot water immersions through to subterranean nuclear bombs as means to separate bitumen from its associated sands.<sup>14</sup> Large-scale commercial exploitation began in 1967 with the Great Canadian Oil Sands (now Suncor) plant. In 1978 a consortium of government and large oil companies opened a larger plant (Syncrude). Both employ processes that strip the overburden, sometimes many metres thick, from above the tar sands. The underlying medium is excavated using large-scale strip mining techniques; the severed ore is slurried and run through a multistage heat, water and chemical separation process. Residual hydrocarbons are refined, fractured, or synthesized and processed for market. Expansions and new projects costing billions of dollars are proposed or under way—\$5 billion for the present but swelling to \$25 billion by 2020.<sup>15</sup>

## INDUSTRY EFFECTS

If it were as simple as gasoline coming from the pump and oil from the can, the industry might be nearly benign. But oil and gas lie deep in the earth,





broadcast widely, and it is a long and tortuous path from their discovery bed until their ultimate conversion into entropic energy, atmospheric pollution and garbage.

Well boreholes penetrate many strata, some carrying salt water, others fresh, a few coal, gas or oil. Despite efforts, interstrata movement of water or other material occurs, polluting some formations and draining others. Chemicals, some toxic or radioactive, may be introduced downhole to move through formation, often assisted by induced massive fracturing of the strata. Downhole casing and cementing minimize effects but have a finite lifespan. After depletion the well is abandoned. Abandonment and reclamation costs are estimated by some to average \$60,000 per well, motivating others to avoid proper procedures. Even when done by the rules abandonment only postpones problems. Depending on the downhole chemistry and physics, steel casing's integrity may last a century or more, but they will finally corrode and rupture. Then downhole problems will percolate about, posing groundwater and surface problems. Alberta's oil fields will ultimately become a subsurface Swiss cheese menacing future Albertans and the land.

In the White Area, the 37% of the province that is settled, industry's surface effects are difficult to separate from agriculture's. Producing and abandoned well-sites, batteries and plants stand out prominently but other developments are more subtle, hidden by the plough. Oil and gas roads are nearly indistinguishable from others; seismic and pipeline right-of-ways submerge beneath a sea of summerfallow or monoculture crops.

White Area lands are often privately owned so that oil and gas operators negotiate surface use agreements directly with farmers. Accommodations result to fit agricultural practices, well-site location and road design. In this rude symbiosis farmers receive rents, damages, and other monetary considerations and the land receives mounting exploitation and cumulating impacts. Surface activities destroy topsoil, sometimes polluting it with toxic waste but also resulting in groundwater contamination.<sup>16</sup> Neither farmer nor oilman wants to interfere with cropped areas, so the little margin land left, refugia for plant and beast, become access roads and lease sites. This ad hoc multiple-use planning ensures the fullest, fastest extraction of value from the land, but oil's intrusions pump its "fair" from the land and leaves its "foul"—deep wells, deep soil disruption, more intense pollutants and new exotics.

Alberta's 200,000 wells each have their one hectare or larger well-site. Small industrial sites, they are often noisy and malodorous. They clearly belong in the Noosphere. By themselves, these wells occupy over 2,000 km<sup>2</sup> of Alberta's surface. Connecting them are hundreds of thousands of



kilometres of roads, pipelines, and powerlines linked into almost 20,000 processing facilities, all crosshatched by millions of kilometres of seismic.

Industry's pitch is that it creates energy and, once beneficially used, it ceases to be. That is not so. They do not create, but merely transport and transform. Nature created the organic materials pooling in Earth's depths. Industry takes it to the surface, then transfers it to applications usually thousands of kilometres distant. Nor do hydrocarbons cease to be when consumed. Whether for energy, lubrication, plastics or other materials, hydrocarbons metamorphose in use from the beneficent to maleficent. Slave to thermodynamics' first law (energy-matter cannot be created or destroyed), every barrel of oil or bin of coal ever burned is still with us, diffuse but active—and menacing. Our air, the atmosphere, is a convenient garbage can for much of it. Out of sight, out of mind, but not out of the loop or out of play.

With about 0.5% of the world's population, Canada "contributes about 2% of the world total of CO<sub>2</sub>, is the eleventh-largest CO<sub>2</sub> producer in the world and the third-largest on a per capita basis."<sup>17</sup> Alberta leads Canada by a stellar margin in per capita greenhouse gas emissions. With less than 10% of the population, it produces 27% of Canada's emissions or more.<sup>18</sup>

It will worsen in the future. As the economic efficiency of Alberta's conventional fossil fuel industry dwindles, more and more energy and resources are required to extract each additional barrel of oil. Progressive exploitation of lower-grade, higher-cost oils, results in proportionately larger surface impacts, dissipated energy, wasted resources, and greenhouse gas emissions.

In 1992 Canada signed the Framework Convention on Climate Change and committed to holding greenhouse gas emissions to their 1990 levels by the year 2000. Canada and Alberta's partial response, called the Voluntary Challenge and Registry, uncaged rather than restrained emissions. By 2000, Canada's greenhouse gas emissions will be 12 to 14% higher than 1990. Alberta's "Advantage" will be to greatly exceed that. Now Canada has conditionally targeted a new standard. Its December 10, 1997 Kyoto reduction target is to reduce emissions to 6% below its 1990 level for the period spanning 2008 to 2012. Most of Alberta's commitments go the other way.

As Alberta's fossil fuel mix shifts from conventional oils to heavy oils, bitumen and synthetics, average contributions to greenhouse gas emissions increase. By 2010, non-conventional sources will provide most of Alberta's production. Inefficient and terribly polluting, contributions from their upstream production result, some argue, in roughly 10 times the carbon dioxide and methane emissions of conventional oil.<sup>19</sup> When government



subsidizes and promotes exploitation of these resources it is also subsidizing and promoting smothering increases in greenhouse gases.

Since Leduc No. 1, Alberta has liberated 50 years of fossil fuel production to the atmosphere. Millions of years of carbon fixing have been “defixed” in decades. Atmospheric carbon dioxide levels have increased to “some 25 to 30% higher than they have been at any time within the last 160,000 years.”<sup>20</sup> That will continue to increase while the resource lasts or until nature violently rebels. The penultimate product of the hydrocarbons industry is pollution; its ultimate product is not energy but entropy.

## RESOURCE ISSUES

Industry encourages the idea of nearly infinite reserves of oil and gas. That was the strategy in the early ‘70s:

At the beginning of the decade, big oil was telling the government, and the government, in turn, was telling the Canadian people, that Canada had virtually limitless reserves of oil and gas.

In June of 1971, in what rates as one of the most misinformed statements ever to emerge from the lips of a cabinet minister, Energy Minister Joe Greene announced that “at 1970 rates of production, (Canada’s) reserves represent 923 years supply for oil and 392 years for gas.”<sup>21</sup>

More subtly, this wrongheaded strategy continues today. Worry over future supplies encourages resource conservation. Resource conservation defeats sales and cash flow, thus it is the industry’s enemy. But few seem to care. In the past a 50-year supply was required before oil could be exported. That was lowered in stages. When it reached 25 years in 1987, the Mulroney government dropped the concern, lowering the bar to a frigid zero years supply.

Any production diminishes Alberta’s ultimate conventional oil resource because it is a non-renewable, depleting resource. Drilling adds to proven reserves but not to ultimate reserves. When production removes more than drilling adds, proven reserves decline. Since 1969 drilling has consistently failed to replace production. The *Daily Oil Bulletin* June 17, 1997 headlined recent declines: “Alberta’s Reserve Additions Replace 41% of 1996 Oil Production.” With Alberta’s conventional oil production of 54.8 million cubic metres (345 million barrels) and additions to reserves of only 22.6 million cubic metres (142 million barrels), reserves diminished to 341.8



million cubic metres (2,151 million barrels). At current rates of production (345 million barrels per year), Alberta has less than 6.3 years of conventional reserves, this despite the oil patch's most feverish activity ever in raising and spending money. Licensed wells increased from just over 4,000 in both 1991 and 1992 to record breaking levels in 1997 when 13,212 wells were drilled.

Why focus on conventional oil and gas? They are Alberta's most valuable fossil fuels. The highest quality, easiest to find, exploit, produce, sell and transport, conventional reserves profit industry the most. The least expensive monetarily and environmentally,<sup>22</sup> they earn the giant's share of land fees and royalty income for the Crown and the public purse.

Then, when conventional oil is gone, the tar sands remain. The bitumen or oil sand resource of Alberta is titanic. Alberta Energy and Utilities Board (EUB) estimates that Alberta has in place some 400 billion cubic metres of oil sand or bitumen "of which 49 billion cubic metres (about 12%) are estimated to be ultimately recoverable." Only 269 million cubic metres or 0.5% of it has been produced.<sup>23</sup> Qualitatively this resource is not so grand.

Bitumen's limiting factors are not resource size but economic and environmental consequences. So wasteful is the process that some estimate it takes two to make one—two barrels of oil equivalent (BOE) produce only one barrel of oil. High-cost heavy oils and synthetic crudes are produced while offloading enormous byproducts: expanses of sterile excavated lands; hills of overburden and processed sands; lakes of toxic water and winds laden with gaseous and precipitate wastes. And the giant mechanical moles, tar sands-throughput machines, burrow on, turning life in front to sterile mounds behind, and some oil.

Alberta's nominal 1% royalty on tar sands production fails to cover associated public capital costs, expenses and subsidies.<sup>24</sup> Tar sands production exploits effectively "free land" without recognizing its public and natural burdens. Even if economic, the planet's tolerance of fossil fuels may be crossed long before the resource is consumed. In other words, supplies may last more than a century, but Earth's absorption capacity thresholds may be crossed much earlier.

As for natural gas, until recently the frenzy was to sell it under nearly any circumstance. In Turner Valley days, there was little demand for natural gas, so it was vented into the atmosphere. Provincial regulators slowed that waste by making industry conserve gas until it could be marketed. This ultimately resulted in gas accumulations. To pass this "gas bubble," industry sent salesmen south with dumping on their mind. Since FTA's birth in 1989, Canadian producers pitted their gas against every other



energy resource and said “we will not be undersold!” One commentator claims:

Simply stated, too much gas supply has been trying to sell into much lower available markets. Price has been sacrificed [sic] for volume – BIG TIME! In 1996, Alberta gas producers collectively, in effect, “left on the table” over Cdn\$3.5 billion in gross revenue by driving up the U.S./Alberta price spread with excess supply.<sup>26</sup>

It seems they were not undersold.

Exports took off. In 1987 the U.S. received 38% of Alberta’s gas or 25 billion out of 67 billion cubic metres. Seven years later in 1994 they got 57% of production or about 65 billion of the 114 billion cubic metres sold. Over 55% of Alberta’s gas is exported to the U.S.A. in this inventory clearance. FTA guarantees the clearance sale’s continuation. Industry is captured not only economically, legally and in its developed infrastructures, but by its export market. Its heart and soul is elsewhere. Non-Canadian interests largely own and control it. Land ownership (primarily by international major oil companies), debt ownership (often by foreign parent companies), technology ownership and marketplace power, are all strings on the puppet industry, pulled from beyond the borders.

Until 1983, additions to reserves from drilling generally exceeded production, so that the “gas bubble” grew. Since then, lavish drilling expenditures have failed to find sufficient gas to replace reserves. Large pools were found long ago. Finds now are smaller, lower quality and located in disconnected pools. Reserves to production ratios reveal a steep dive from 75 years to 9.1 years.<sup>27</sup>


## THE LAST BISON HUNT

But it does not end there. In some ways it has just begun. Over 250,000 new wells must be drilled; 500,000 km of all-weather roads built; millions of kilometres of seismic shot; 200,000 km of pipeline must be laid to get the last economic conventional fossil fuels out of the ground and down the pipeline. Government will be called on to provide incentives to ensure that happens, to sustain the industry and to protect jobs. The public will dig deep in their pockets to subsidize these last takings. Most activity will happen in the Green Area, the land not yet fully exploited. It is off now to the Eastern Slopes and the boreal forest.



High-grading—taking the easiest, most accessible, fastest and highest-quality resources—seems only natural but it leads to higher-cost reserves. Flush production turns to marginal production, elephants turn to mice. Fat royalties thin, revealing a past dependency on easy money,<sup>28</sup> and every time government cuts another social program for the people, citizens glower.

Like the Metis bison hunters of 125 years ago, each winter the industry goes out onto the land to hunt their resource, and every spring they come back with less. Finding rates shrink while finding costs swell; reserves fall. But hey, there are still a few bison out there. Someone said there was a herd in the Cypress Hills. And when they are gone, we will move on. Oil's permanence is in moving on.

This describes production's half of the story. Consumption is the other half. While hill and valley were ravaged to find oil, valley and hill are devoured in consuming it. From Bill Cochrane's first Alberta automobile, cranked up on August 8, 1903 at High River, to the end of World War II, the great automobile culture overran the province. Petroleum, internal combustion engines and autos replaced the beast of burden and the leg of man. In doing so it also ran amok over nature, its first big roadkill. 



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