The History of Petroleum Exploration in Western Newfoundland

Newfoundland Labrador

Natural Resources

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THE HISTORY OF PETROLEUM EXPLORATION IN WESTERN NEWFOUNDLAND

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INTRODUCTION

Hydrocarbons in the form of naturally occurring seeps and shows have been observed along the coastline and inland waterways of western Newfoundland for the past two hundred years (Figure 1). The earliest reference dates back to 1812 where it is reported that a Mr. Parsons used oil found along the shoreline of Parson's Pond as a cure for rheumatism. Earlier records may reside with the French, who inhabited the coastline of western Newfoundland before 1812.

These seeps and shows manifest themselves as live and dead oil within various types of host rock, as gaseous emissions from surface and subsurface fractures, and as petroliferous smells or odours produced when rock samples are broken for examination.

In the context of this report, a "seep" is regarded as liquid or tacky oil seen at surface or gas venting to surface. Any form of liquid or tacky oil is considered a live oil show. This definition is subjective because on a hot summer's day, a seemingly dead oil show may become tacky with sustained exposure to sunlight. A dead oil show or solid hydrocarbon consists of a former live oil show stripped of its lighter, more volatile components due to evaporation and other processes. As hydrocarbon-bearing rocks become deeply buried into the subsurface, thermal cracking due to higher temperature and pressure will eventually convert the liquid hydrocarbons into gas and then pyrobitumen, an insoluble, carbon-rich residue.

Onshore western Newfoundland has four sedimentary basins capable of generating hydrocarbons (Figure 2). The Lower Paleozoic Anticosti Basin is the largest at approximately 13,000 km^2. In this report, the Anticosti basin has been subdivided for clarity into Anticosti North, Central and South. Two Upper Paleozoic Carboniferous basins, Bay St. George and Deer Lake, partially overlie the Anticosti Basin towards the east. These basins are each about 2500 km^2 in overall area. Further to the north, along the eastern side of the Northern Peninsula, a small remnant of the offshore Carboniferous age St. Anthony Basin outcrops onshore in fault contact with the Anticosti Basin.

The historic exploration/drilling phase for western Newfoundland had its beginnings with the John Silver well at Parson's Pond in 1867 and culminated with the drilling of four shallow stratigraphic test holes by BHP Petroleum Ltd. at Port au Choix in 1991. It is estimated at least 64 wells were drilled in this timeframe, none of which were located using seismic data. Wells were spotted adjacent to surface seeps or along topographic humps and bumps. Over half the wells drilled encountered trace to minor amounts of oil and/or gas and it is estimated 5000 to 10,000 barrels of oil may have been produced, although no records exist to verify these numbers. Since 1991, seismic has been the primary tool for well selection and therefore the advent of seismic defines the start of the recent exploration / drilling phase for western Newfoundland.

Since 1994, there have been forty onshore wells drilled in western Newfoundland. This total includes exploration wells, delineation wells and shallow stratigraphic test holes. Some of these wells failed to penetrate overburden or were abandoned prematurely due to drilling-related problems. Although most of these wells encountered hydrocarbons, only the Garden Hill Port au Port #1 well on the Port au Port Peninsula was successful in achieving limited hydrocarbon production.

For offshore western Newfoundland, the Canada-Newfoundland & Labrador Offshore Petroleum Board (C-NLOPB) reports that nine onshore to offshore wells and one offshore well have been drilled since 1995.

The presence of hydrocarbon seeps and shows throughout western Newfoundland demonstrates the petroleum potential in the area and the presence of an active petroleum system. There are at least one and maybe more source rock units capable of generating hydrocarbons. These source rocks were buried deep enough, at least in some parts of the four basins, to become thermally mature and therefore capable of generating and expelling hydrocarbons. Produced hydrocarbons, once expelled, migrate upwards into suitable trapping structures or towards surface. Numerous geological processes can affect, disturb or alter them during upward migration, while they reside in a geologic trap or at surface. The end result is usually a degraded hydrocarbon and these are quite common throughout western Newfoundland, manifested as live or dead oil seeps and shows.

This report covers the historical drilling period from 1867–1991. Information on the modern drilling period is available in the report titled “The Green Point Shale of Western Newfoundland”.

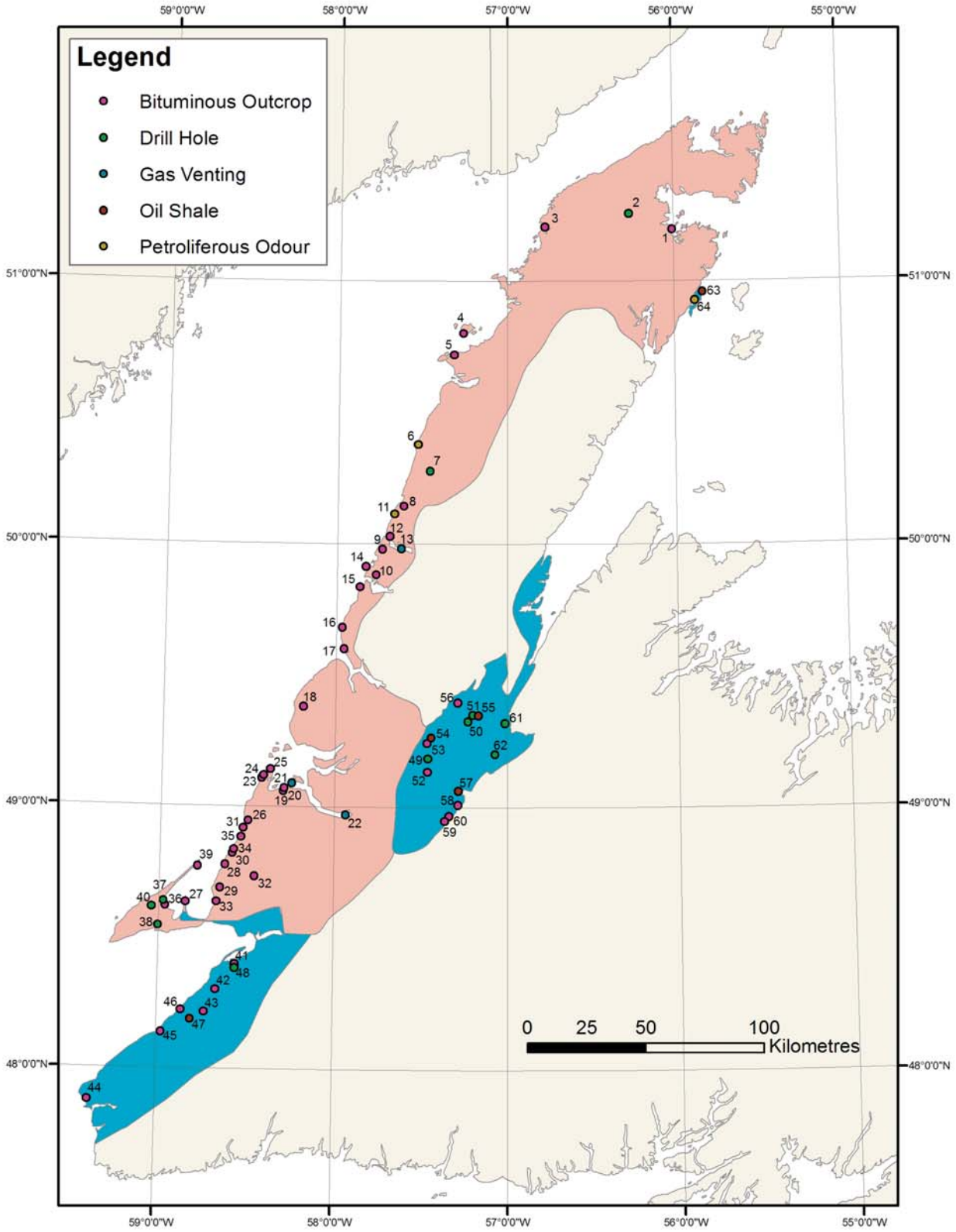

Figure 1. *West Newfoundland petroleum occurrence map. Numbers refer to shows described in Table 1.*

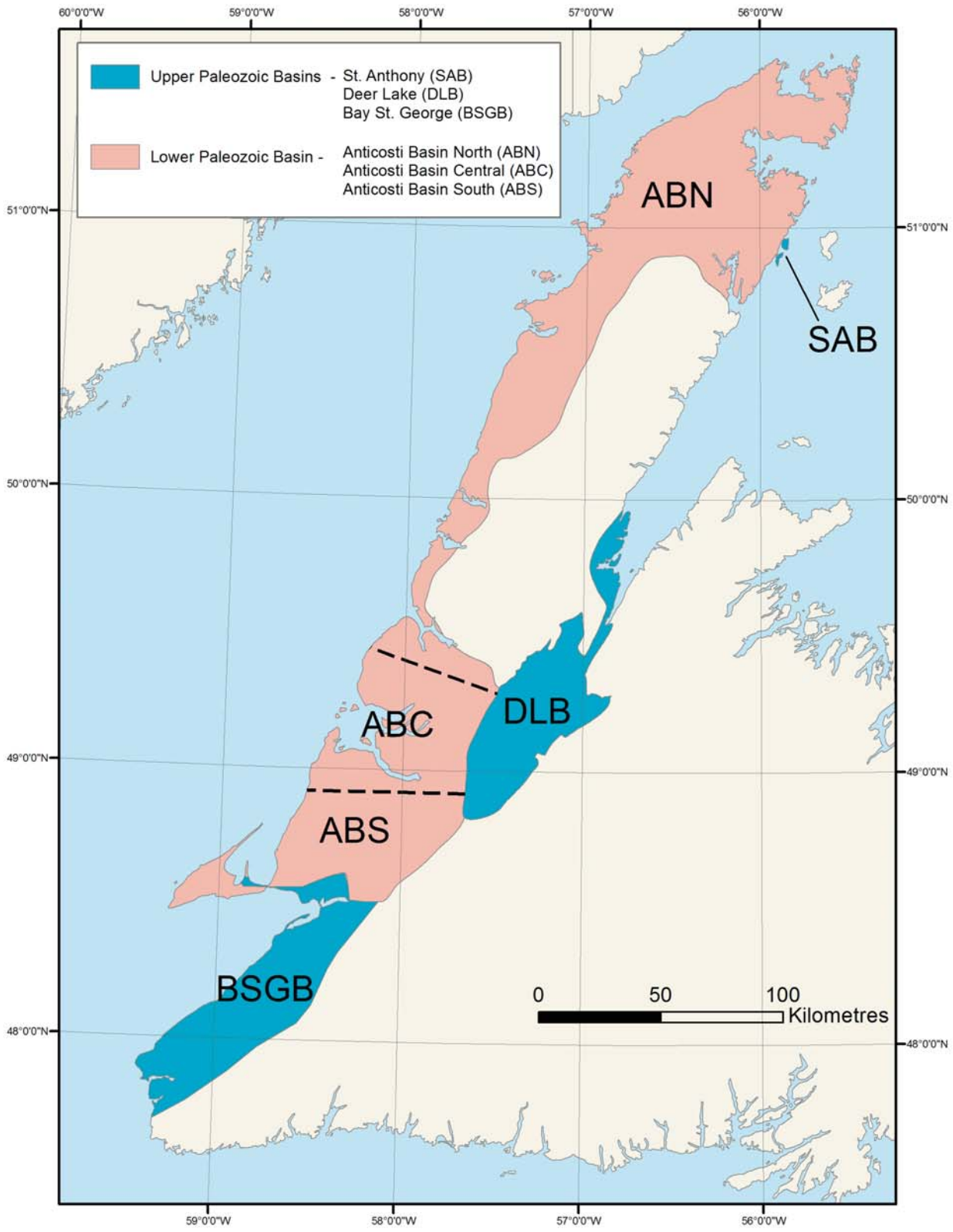

Figure 2. *West Newfoundland sedimentary basins map.*

SEEPS AND SHOWS

Live and dead oil shows, gaseous emissions and petroliferous odours have been noted throughout western Newfoundland for at least two hundred years (Figure 1, Table 1, and Figures 3 to 21). In addition to surface seeps and shows, records from mining core holes drilled over the past one hundred years also allude to numerous live and dead hydrocarbon occurrences.

The first known mention of an oil seep in English records dates back to 1812 when a Mr. Parsons used oil from seeps along the shoreline at Parson's Pond as a cure for rheumatism. Elsewhere in the region, Alexander Murray, the first government geologist for Newfoundland, described in his Report of Activities for 1865 an oil show at Shoal Point. James Howley, who worked under Murray, visited the site in 1874 and described the liquid hydrocarbons he observed. Liquid hydrocarbons, as witnessed by the author in 2014, will still accumulate in holes dug into beach gravels along this stretch of coastline.

Figure 2 provides a map of the sedimentary basins in western Newfoundland. Within the Lower Paleozoic Anticosti Basin North (ABN) region, indications of dead oil are seen in surface rocks near Hare Bay, at St. Barbe, and near Port aux Choix. Further south bitumen showings are common around the Table Point Ecological Reserve and live oil was reported in mining core holes at Daniel's Harbour. Live and dead oil showings are documented in the Gros Morne area, in particular at Cow Head, Broom Point, Martin Point, Green Point and Lobster Cove Head.

In the Central Anticosti Basin (ABC), oil stained rocks are common around the outer Bay of Islands. Seafloor mapping in this area suggests there may be natural gas venting up through the sea floor muds. Traces of live oil are known from rocks at Little Port and bitumen and oil staining is seen at several other sites south to the Serpentine River.

For the Anticosti Basin South (ABS) region, numerous occurrences of bitumen and oil stained rocks are known along the coast surrounding Port au Port Bay, including those at Molly Ann Cove, Sluice Brook, Bluff Head Brook, Fox Island River and Phillips Brook. On the Port au Port Peninsula, fine grained limestones and limy sandstones at West Bay and Shoal Point contain common bitumen, and drilled water wells around West Bay are frequently contaminated with hydrocarbons. Hydrocarbons are also known from mineral exploration drilling in this area. Recovered core frequently contains live oil within vugs.

Numerous seeps and shows are also seen in the Upper Paleozoic, Carboniferous basins. The Bay St. George Basin (BSGB) hosts hydrocarbons, with bitumen found in rocks exposed along Fischells River, Flat Bay River and Middle Barachois River. Further south, bitumen is found along Crabbes River and on the coast at Highlands and Codroy. There are many occurrences of bitumen, solid hydrocarbons, oil shales and gas in the Deer Lake Basin (DLB), mostly in the northwest part of the basin but also along the shores of Grand Lake. To the north, the onshore sliver of the St. Anthony Basin (SAB) which encompasses the Cape Rouge and Conche Peninsula hosts a number of live and dead oil shows as well as oil shale.

All of the basins in western Newfoundland contain live and dead oil shows. The Department of Natural Resources maintains a file with approximately 200 records outlining the details of these hydrocarbon occurrences (Table 1). This represents only a small part of what is believed to be present throughout the region.

Within the Anticosti Basin, especially at Port aux Choix and Sluice Brook, the nature of the contained hydrocarbons clearly suggests those areas may be exhumed oil reservoirs. Taken together, the presence of hydrocarbons and trap/seal indicate viable petroleum systems exist within the basins. All of the basins host viable source rocks, albeit in various stages of thermal maturity. For the Anticosti Basin thermal maturity appears to increase from west to east and south to north. The biggest risk factor with respect to finding a petroleum discovery may be whether sufficient organic-rich source materials were buried deep enough to generate and expel large quantities of oil and gas and if so, are there sufficient volumes of trapped hydrocarbons remaining to be commercially viable.

Table 1 provides a detailed breakdown for each hydrocarbon occurrence plotted on Figure 1. Where possible, the original reference has been provided for each occurrence. Most of these references can be accessed through the Department of Natural Resources, Mineral Occurrence Database System (MODS) or Geofiles database.

Figure 3. *Hydrocarbon stained fracture and bedding surfaces within parted to ribbon limestones of the Green Point Formation, Cow Head Group, at Green Point.*

Figure 4. *Hydrocarbon stained fracture and bedding surfaces within parted to ribbon limestones of the Green Point Formation, Cow Head Group, at Broom Point.*

Figure 5. *Hydrocarbon stained fracture and bedding surfaces within parted to ribbon limestones, Shallow Bay Formation, Cow Head Group, at Cow Head.*

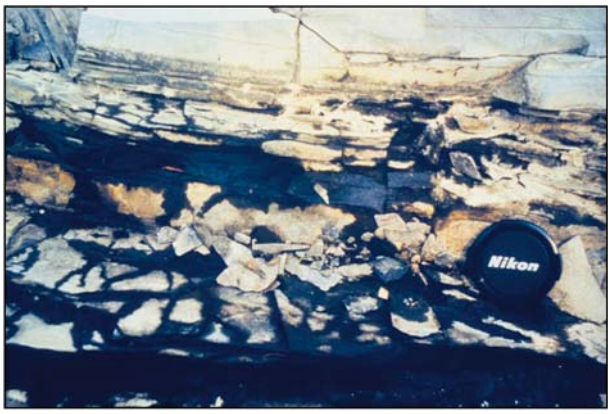

Figure 6. *Hydrocarbon stained fracture and bedding surfaces within parted to ribbon limestones of the Cow Head Group, shoreline at Parson's Pond.*

Figure 7. *Hydrocarbon stained fracture surfaces within parted limestones of the Cow Head Group, at Portland Creek Quarry, Northern Peninsula.*

Figure 8. *Solid hydrocarbons infilling localized breccia and fracture zones, St. George Group carbonates, at Table Point, Northern Peninsula.*

Table 1. Hydrocarbon seeps and shows in western Newfoundland

No.	Location	Basin	Type of Show	Show Description	Reference
1	Belvie Bay	ABNorth	Bituminous outcrop	Bed of brownish black bituminous limestone	Murray (1881), Ch. 2 - 1864
2	Round Pond	ABNorth	Drill hole	Tarry hydrocarbons and live oil shows	MacDonald (1975)
3	St. Barbe Harbour	ABNorth	Bituminous outcrop	Quartz crystals in vugs within sparry dolomite coated with hydrocarbon residue	Source unknown at present
4	St. John Island	ABNorth	Bituminous outcrop	Mineralized dolomite veins impregnated with oil	Knight and Boyce (1984)
5	Back Arm	ABNorth	Bituminous outcrop	Abundant hydrocarbon residue, possible exhumed oil reservoir	Baker and Knight (1993)
6	Deer Cove	ABNorth	Petroliferous odours	Dolostones exude petroliferous odour when broken	Dept. of Natural Resources, internal
7	Daniel's Harbour	ABNorth	Drill hole	Live (liquid) oil shows in drill core	Boyce (1981)
8	Portland Creek Quarry	ABNorth	Bituminous outcrop	Hydrocarbon staining along fracture surfaces	Dept. of Natural Resources, internal
9	Parson's Pond Quarry	ABNorth	Bituminous outcrop	Hydrocarbon staining along fracture surfaces	Dept. of Natural Resources, internal
10	St. Paul's Inlet Quarry	ABNorth	Bituminous outcrop	Hydrocarbon staining along fracture surfaces	Dept. of Natural Resources, internal
11	The Arches	ABNorth	Petroliferous odours	Dolomitized breccias exude petroliferous odour when broken	Dept. of Natural Resources, internal
12	Parson's Pond	ABNorth	Bitumious outcrop	Shoreline exposures contain hydrocarbon residues	Fleming (1970)
13	Thomson's Island	ABNorth	Gas venting	Natural gas explosions observed sporadically	Henry (1910)
14	Cow Head Peninsula	ABNorth	Bituminous outcrop	Hydrocarbon staining along fracture surfaces	Dept. of Natural Resources, internal
15	Broom Point	ABNorth	Bituminous outcrop	Hydrocarbon staining along fracture surfaces	Dept. of Natural Resources, internal
16	Green Point	ABNorth	Bituminous outcrop	Hydrocarbon staining along fracture surfaces	Dept. of Natural Resources, internal
17	Lobster Cove Head	ABNorth	Bituminous outcrop	Pyrobitumen specks noted in sandstones	Stevens *et al.* (2003)
18	Chimney Cove	ABCentral	Bituminous outcrop	Minor amounts of oily tar along fracture surfaces	Lilly (1956), Geofile No. 012G/01/0039
19	No. 4 Mine Brook	ABCentral	Bituminous outcrop	Oil bearing grey limestone interbedded with sandstone and shale	Stevens (1965)
20	Shoreline Candlelight Inn	ABCentral	Bituminous outcrop	Pyrobitumen along fracture surfaces	Dept. of Natural Resources, internal
21	Bay of Islands	ABCentral	Gas venting	Gas venting to the seafloor	Shaw *et al.* (2000)
22	Humber Arm	ABCentral	Gas venting	Gas emanating from Quaternary sediments or bedrock	Shaw *et al.* (2000)
23	Little Port	ABCentral	Bituminous outcrop	Trace quantities of live oil and bitumen along fractures	Dept. of Natural Resources, internal
24	Bottle Cove	ABCentral	Bituminous outcrop	Pyrobitumen along fracture surfaces in siltsone and pillow basalts	Dept. of Natural Resources, internal
25	Trumpet Cove	ABCentral	Bituminous outcrop	Limestones are hydrocarbon stained	Burden *et al.* (2001)
26	Serpentine River	ABCentral	Bituminous outcrop	Limestone beds locally bituminous along fracture surfaces	Stevens (1965)
27	Shoal Point	ABSouth	Bituminous outcrop	Liquid petroleum to solid bitumen along shoreline	Murray (1881), Ch. 14 - 1874
28	Bluff Head Brook	ABSouth	Bituminous outcrop	Bituminous limestones	Murray (1881), Ch. 14 - 1874
29	Fox Island River	ABSouth	Bituminous outcrop	Bituminous limestones	Murray (1881), Ch. 14 - 1874
30	Lewis Brook	ABSouth	Bituminous outcrop	Bituminous limestones	Murray (1881), Ch. 14 - 1874
31	Rope Cove Head	ABSouth	Bituminous outcrop	Crystalline bitumen along fractures	Murray (1881), Ch. 14 - 1874
32	Phillips Brook	ABSouth	Bituminous outcrop	Sandstone blocks rich in hydrocarbons	Walthier (1949)
33	Two Guts Pond	ABSouth	Bituminous outcrop	Heavily bitumen stained sandstone bed	Murray (1881), Ch. 14 - 1874
34	Sluice Brook	ABSouth	Bituminous outcrop	Oil saturated upper Blow Me Down Brook Formation sandstone	Burden *et al.* (2005)

Table 1. Continued.

No.	Location	Basin	Type of Show	Show Description	Reference
35	Molly Ann Cove N & S	ABSouth	Bituminous outcrop	Bitumen saturated Blow Me Down Brook Formation sandstones	Burden *et al.* (2005)
36	West Bay	ABSouth	Bituminous outcrop	Bitumen along fracture surfaces in limestone and sandstone	Corkin (1965)
37	West Bay	ABSouth	Drill hole	Water wells often contaminated with hydrocarbons	Williams *et al.* (1996)
38	South of Lourdes	ABSouth	Drill hole	Bitumen or live oil filled vugs in calcite veins, live oil along fractures	Saunders and Hardy (1975)
39	Long Point	ABSouth	Bituminous outcrop	Bitumen veinlets (<1 cm wide) cutting Lourdes limestone	Dept. of Natural Resources, internal
40	South of Lourdes	ABSouth	Drill hole	Liquid hydrocarbons within vuggy calcite veins in DDH RND-002	Thomas (1992)
41	Flat Bay Brook	BSGB	Bituminous outcrop	Bituminous limestone	Murray (1881), Ch. 13 - 1873
42	Fischell's Brook	BSGB	Bituminous outcrop	Bituminous limestone giving off a fetid odour when broken	Murray (1881), Ch. 13 - 1873
43	Middle Barachois Brook	BSGB	Bituminous outcrop	Very fetid bituminous limestone bed	Murray (1881), Ch. 13 - 1873
44	Black Point, Codroy Shoreline	BSGB	Bituminous outcrop	Bituminous residues within limestone bed	Hayes and Johnson (1938)
45	Highlands Shoreline	BSGB	Bituminous outcrop	Bituminous residue in vugs and shells within limestone	Hayes and Johnson (1938)
46	Crabbes River Mouth	BSGB	Bituminous outcrop	Bitumen along fracture surfaces in limestone	Bell (1948)
47	Crabbes River	BSGB	Oil shale	Siltstone bed resembles a very lean oil shale	Bell (1948)
48	Flat Bay Area	BSGB	Drill hole	Natural gas (Hole 24N0E) and oil (Hole 28N4W) seen while drilling for gypsum	McKillop (1957)
49	Nicholsville	DLB	Drill hole	Numerous gas shows Landell-Mills #1 well	MODS 012H/03/Btm002
50	Cormack	DLB	Drill hole	Numerous gas shows Claybar #3 well	MODS 012H/06/Btm002
51	Cormack	DLB	Drill hole	Numerous gas shows Claybar #1 well	MODS 012H/06/Btm001
52	Lane Brook	DLB	Bituminous outcrop	Live oil along fracture surfaces	Pers. comm. with Cabot Martin, Deer Lake Oil and Gas Ltd.
53	Cormack Quarry	DLB	Bituminous outcrop	Banded speleothem calcite with admixed hydrocarbons	Dept. of Natural Resources, internal
54	Rocky Brook Cabins	DLB	Oil shale	Petroliferous brownish colored shales	Macauley, 1987 (2)
55	Richard Squires Park	DLB	Oil shale	Petroliferous brownish colored shales	Macauley, 1987 (2)
56	Adies Pond	DLB	Bituminous outcrop	Brecciated red shales with bituminous material covering fracture surfaces	Wilkinson, 1981
57	Wetstone Point	DLB	Oil shale	petroliferous brownish colored shales	MODS 012H/03/Btm001
58	Grindstone Point	DLB	Bituminous outcrop	Conglomerate/sandstone matrix infilled with pyrobitumen	MODS 012H/03/Btm027
59	Little Pond Brook	DLB	Bituminous outcrop	Conglomerate/sandstone matrix infilled with pyrobitumen	MODS 012A/14/Btm001
60	Little Grand Lake East #2	DLB	Bituminous outcrop	Conglomerate/sandstone matrix infilled with pyrobitumen	MODS 012A/14/Btm003
61	Sandy Lake	DLB	Drill hole	Heavily bituminous sandstone beds	O'Sullivan (1979)
62	Hatch #2 Coal Hole	DLB	Drill hole	Heavily bituminous sandstone beds	Hatch. (1920)
63	Pillers Cove	SAB	Oil shale	Petroliferous brownish colored shales	Murray (1881), Ch. 2 - 1864; Baird (1966, 1957)
64	Cape Rouge Harbour	SAB	Petroliferous odours	Live to dead oil along fracture surfaces	Murray (1881), Ch. 2 - 1864; Baird (1966, 1957)

Figure 9. *Live oil show / bitumen staining within sedimentary units exposed along beach, northeast side of Little Port, outer Bay of Islands.*

Figure 10. *Pyrobitumen coated fracture surfaces within Little Port Complex pillow basalts, Bottle Cove, outer Bay of Islands.*

Figure 11. *Pyrobitumen vein (approx. 2-3 cm thick) cutting Little Port Complex volcanic rocks, northwest side (at shoreline) of Bottle Cove, outer Bay of Islands.*

Figure 12. *Pyrobitumen stained, fracture surfaces within Blow Me Down Brook Formation sandstones, shoreline near Candlelite Bay Inn, Humber Arm.*

Figure 13. *Bitumen saturated Blow Me Down Brook Formation sandstones at Molly Ann Cove (north), western Newfoundland; Erin Gillis (Nalcor) photo.*

Figure 14. *Bitumen saturated Blow Me Down Brook Formation sandstones at Molly Ann Cove (south), western Newfoundland; Erin Gillis (Nalcor) photo.*

Figure 15. *Oil stained hinge zone associated with Lourdes Formation folded limestone, Long Point, Port au Port Peninsula.*

Figure 16. *Live hydrocarbons along fracture surfaces, Humber Arm Allochthon grainy limestone, Tea Cove, Port au Port Peninsula.*

Figure 17. *Hydrocarbon saturated (semi-live oil) Humber Arm Allochthon grainy limestone, West Bay Beach, Port au Port Peninsula.*

Figure 18. *Live oil show within vuggy calcite veins cutting Table Cove shales and ribbon limestone, Piccadilly Harbour, Port au Port Peninsula.*

Figure 19. *Live oil collected from depressions dug into beach sands over Humber Arm Allochthon shales, west side of Shoal Point, Port au Port Peninsula.*

Figure 20. *Hydrocarbon saturated calcareous sandstone, possible Blow Me Down Brook or Eagle Island Formation, Two Guts Pond, south of Fox Island River.*

HISTORIC EXPLORATION / DRILLING

The historic exploration / drilling phase is defined as wells drilled without the assistance of seismic data. Drilling in western Newfoundland began with the John Silver well in 1867 and culminated with four shallow stratigraphic test holes drilled by BHP Petroleum Ltd. at Port au Choix in 1991 (Figure 21, Table 2).

John Silver, a Halifax saw mill operator, drilled the first petroleum well at Parson's Pond in 1867. Mr. Silver had heard rumours of oil along the shoreline from trappers who frequented the area. Realizing its commercial potential and having the means to investigate, he came to the pond and drilled a well to a depth of 213 metres. This was only nine years after Colonel Edwin Drake drilled the first petroleum well in North America near Titusville, Pennsylvania in 1859.

Minor oil shows and fear of French interference along this stretch of the French Shore discouraged Silver and he departed the region after the one well. No other activity took place until the early 1890s. At this time, the Newfoundland Oil Company was incorporated in St. John's and over the next ten to fifteen years, they and other Newfoundland incorporated oil companies drilled possibly nine or ten wells at Parson's Pond. At the same time, the Canadian-Newfoundland Oil Company drilled one well at St. Paul's Inlet and the Western Oil Company put down at least four wells at Shoal Point on the Port au Port Peninsula. All these ventures ultimately failed for various reasons.

In 1910, J.D. Henry a British oil expert published, in a book titled "Oilfields of the Empire" a report on west Newfoundland oil. This glowing account on the potential for commercial oil intrigued British capitalists and a number of companies were incorporated to explore this area. From 1911 to 1925, at least three British companies operated at Parson's Pond. In 1922, General Oilfields Ltd. had three wells in the drilling stage, three wells in the pumping stage and one being bailed. The onsite oil refinery was producing approximately twenty-five barrels of oil per week. Further to the south at Shoal Point an unnamed British company apparently drilled at least one well around 1911.

Up to this time all drilling activity had been focused on liquid hydrocarbons. Between 1913 and 1921, two or three British companies explored and drilled within the Deer Lake basin, searching for a viable supply of oil shale. After 1925, there was no further petroleum activity in western Newfoundland for at least the next twenty-six years.

In the early 1950s, American entrepreneur John Fox came to western Newfoundland and drilled three wells at St. Paul's Inlet and two at Parson's Pond. The wells encountered some hydrocarbons, but limited success coupled with a fire in 1954 that destroyed the company's drilling office and records discouraged Fox. The company departed the area the same year. One year later, Newkirk Mining and Claybar Uranium drilled four wells in the Deer Lake Basin. Two of these wells had numerous gas shows and displayed minor traces of oil. At about the same time, the Newfoundland government was undertaking delineation drilling on the Flat Bay gypsum occurrence in Bay St. George and while drilling their test holes struck natural gas in one hole and liquid petroleum in another.

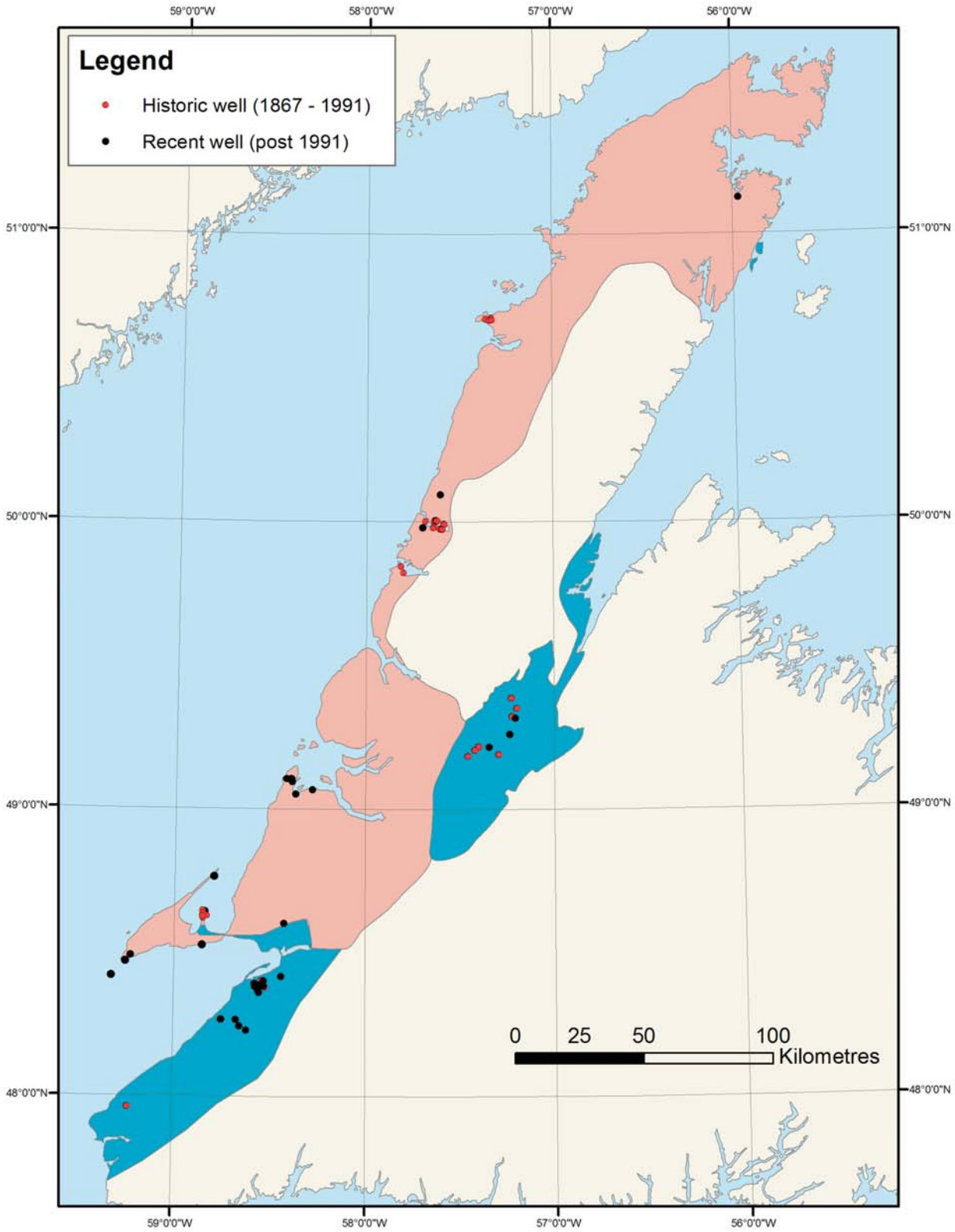

Figure 21. *West Newfoundland historic wells location map.*

Table 2. Historic wells, western Newfoundland

Well No.	Basin/Area	Company	Year Drilled	Remarks
1-27	ABNorth - PP	1 – John Silver	1867	Minor oil
		9 – Nfld. Oil Co. and other Nfld. incorporated companies	1895-1906	Oil and gas *some production
		14 – Nfld. Oil Fields Ltd., Parsons Pond Oil Syndicate, General Oil Fields Ltd. and other British incorporated companies	1911-1925	Oil and gas *some production
		2 – John Fox Syndicate	1952-1953	Oil and gas shows
		1 –Nalco / Canadian Javelin	1965	Oil and gas shows
28-35	ABNorth - SPI	1 – Canadian–Newfoundland Oil Company	1896-1897	*pumped 2 bbls oil
		3 – John Fox Syndicate	1952-1953	Oil and gas shows
		4 – Home owners or town of St. Paul's Inlet	1970s	Contaminated with hydrocarbons
36-48	ABSouth - SP	4 – Western Oil Company	1898-1901	Produced upwards of 20 bbls oil / day
		7 – Company unknown (mention of wells by Baker, Nfld. government geologist - 1928)	Up to 1928?	No records
		2 – Brinex and Golden Eagle Oil & Gas Co.	1965	Numerous shows in Shoal Point #2 well
49-57	DLB	2 – Harold Spence	1911-1913	No records
		3 – Colonial Oil & Chemical Co.	1919-1921	Numerous gas shows in first well
		4 – Claybar Uranium & Newkirk Mining	1955-1956	Numerous gas shows
58-60	BSGB	2 – Mining core holes (Nfld. government)	1955-1956	Struck oil and gas
		1 – Union-Brinex (Anguille H-98 well)	1973	No shows
61-64	ABNorth - PAC	4 – BHP Ltd. shallow mining core holes (Port au Choix #1, #2, #3, #4)	1991	Numerous oil shows

PP – Parson's Pond; **SPI** – St. Paul's Inlet; **SP** – Shoal Point; **DLB** – Deer Lake Basin; **BSGB** – Bay St. George Basin; **PAC** – Port au Choix

In 1965, NALCO (Newfoundland and Labrador Corporation) and partners put down one well at Parson's Pond to a depth of 1302 metres. This well encountered a number of oil and gas shows over a net pay interval of approximately 35 metres. Subsequent geochemical analyses indicate the oil to be "sweet" and had an API gravity of 43.40. In the same year, Brinex and Golden Eagle Oil and Gas Ltd. drilled two wells at Shoal Point. The Shoal Point #2 well contained numerous live and dead oil shows.

In 1973, Union-Brinex drilled the Anguille H-98 well in the southern end of the Bay St. George basin. This well did not encounter hydrocarbons. During the early 1990s, BHP Petroleum Ltd. put down four shallow core holes at Port au Choix in order to evaluate highly porous, bitumen saturated dolostones. Drill results suggest the petroliferous dolostones may have been at one time a subsurface oil reservoir that is now exhumed at the surface.

Sixty-four wells may have been drilled between 1867 (John Silver well) and 1991 (BHP Petroleum wells). Four were drilled at Port au Choix, twenty-seven at Parson's Pond, eight at St. Paul's Inlet, thirteen at Shoal Point, nine in the Deer Lake Basin and three in the Bay St. George Basin. All the wells were drilled without the benefit of seismic data, being sited primarily adjacent to surface seeps or along the crests or flanks of uparched rock structures referred to as anticlines. Over half these wells encountered trace to minor amounts of oil and/or gas. At Parson's Pond it is estimated that 5000 or more barrels of oil were produced and used to support drilling operations, sold to local fishermen along the coast or shipped to the Gasworks plant in St. John's where the oil was mixed with coal oil and used to light the street lamps along Duckworth and Water streets. An unknown volume of oil was also produced at Shoal Point on the Port au Port Peninsula. Records from St. Paul's Inlet indicate a few barrels of oil were pumped during a single testing operation.

Water wells drilled at St. Paul's Inlet during the 1970s and in the West Bay area in the 1940s had to be abandoned due to the presence of hydrocarbons. A report by H. Corkin in 1965 states that in the West Bay area, the majority of wells are contaminated with oil and must be abandoned.

Figure 21 contains a map of recent and historic wells drilled in western Newfoundland. Table 2 provides a synopsis of information related to each well drilled from 1867 to 1991.

SUMMARY

There are hundreds of known, naturally occurring oil seeps and shows distributed throughout all four basins in western Newfoundland. Most would be considered dead oil; however in a few areas (Shoal Point and Parson's Pond) live oil shows are common. The shows suggest working petroleum systems exist or have existed at some time in each of the basins. The presence of liquid hydrocarbons at surface may indicate subsurface traps are leaky due to compromised sealing rocks or quite possibly buried source rocks are still generating hydrocarbons that migrate to surface along fractures and faults. Rocks in western Newfoundland were subjected to at least four deformational events, starting from 500 to 300 million years ago and each episode of deformation has structurally disturbed the rocks in some manner. Extensional and compressional stresses associated with each deformation would leave an imprint, primarily in the form of open- and closed-fracture systems, faults and folded rock layers. Any of these structures could act as a conduit to bring hydrocarbons to surface.

Conduits to surface do exist and hydrocarbons are finding their way into surface waters and subsurface aquifers. This is verified by the number of live surface shows, and contaminated, hydrocarbon-bearing water wells observed in the past. It is difficult to judge whether water wells drilled today are contaminated; discussions with water well drilling companies operating in western Newfoundland proved to be inconclusive. Drillers had heard of a few contaminated wells, but were unable to verify exact locations. Likewise, Department of Environment, Water Resources Management Division groundwater specialists indicated they had no confirmed data on hydrocarbon contaminated wells. In fact, abandonment records for the most part only state a well was abandoned and reasons as to why are not recorded.

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