

# OIL AND GAS EXPLORATION AND DEVELOPMENT ACTIVITY IN ONTARIO IN 2001

T.R. Carter<sup>1</sup> and B.D. Parkes<sup>2</sup>

<sup>1</sup>Subsurface Geologist, Petroleum Resources Centre, Ministry of Natural Resources, London

<sup>2</sup>Manager, Oil, Gas and Salt Resources Library

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## INTRODUCTION

Oil and gas drilling activity continued at the strong levels established in 2000, spurred by record natural gas prices and higher than average oil prices early in the year, and record production revenues for the previous year. Prices moderated considerably late in the year, due to high natural gas storage levels in North America and a very mild winter in 2001-2002. In 2001 Ontario producers received \$55.7 million for crude oil shipments and an estimated \$95.4 million for natural gas produced in the province, compared to \$65.6 million and \$102 million respectively in 2000.

## NORTH AMERICAN MARKETS

### Natural Gas<sup>1</sup>

Natural gas prices soared in January 2001 due to low natural gas storage inventories, high world crude oil prices, high gas demand for power generation, low gas drilling in previous years and due to a much colder winter over 2000-2001. January 2001 saw natural gas commodity prices peaking at \$13.78 Cdn/GJ (AECO storage hub), an increase of 63% from December 2000. Due to a recession in the U.S. and world economies, and the events of September 11, commodity prices spiralled downward during the year, with a December average of \$3.39 Cdn/GJ. Despite the downward trend of natural gas prices, the average price in 2001 increased to \$5.91/GJ from \$4.81/Gigajoule in 2000, an increase of 23%.

### Crude Oil<sup>2,3</sup>

Crude oil prices averaged around US \$26 per barrel during 2001 (WTI NYMEX), down from an average of US \$30 per barrel in 2000. Crude prices dropped as low as US \$18 per barrel in early December 2001. Demand for petroleum products and crude oil declined in 2001 as the world economy slid into recession. The overall decline in demand put downward pressure on crude oil prices. The downturn in commercial air travel, created by September 11 events, depressed prices even further. OPEC made several production cuts throughout the year to alleviate the low prices.

## EXPLORATION ACTIVITY

Oil and gas drilling activity in Ontario during 2001 remained at high levels as commodity prices for natural gas and crude oil fuelled exploration and development activity. A total of 142 licences to drill and operate new wells were issued by the Ministry of Natural Resources in 2001, compared to 118 in 2000. At the time of writing, drilling was reported to be complete at 112 wells consisting of 34 exploratory wells, 76 development wells, and 2 service wells. Horizontal drilling accounted for 36 of the 112 wells drilled in 2001, continuing the increasing popularity of this technology. The 2001 exploratory drilling resulted in 14 wells reported as gas producers and 3 wells reported as oil producers (Table 14-1, Fig.14-1). Development drilling was very successful with 19 wells reported to be oil producers and 46 as gas producers. Most of the successful oil wells were completed in Ordovician targets, while completions in Silurian sandstone reservoirs dominated the gas-producing wells.

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1 Natural Resources Canada, Natural Gas Market Update ([www.nrcan.gc.ca](http://www.nrcan.gc.ca))

2 Natural Resources Canada, Oil Division ([www.nrcan.gc.ca](http://www.nrcan.gc.ca))

3 Fuel Facts Price Monitoring, Ontario Edition, vol.2, issue 24, Dec.18,2001 ([www.mjervin.com](http://www.mjervin.com))

Talisman Energy Inc. was the most active exploration company in Ontario's petroleum industry in 2001, with 35 wells drilled. As in previous years Talisman focussed its efforts on the Ordovician oil play and on natural gas pools in Silurian sandstone and reef targets beneath the waters of Lake Erie. Greentree Gas & Oil Ltd. finished the year in second place with 20 wells drilled, all in the Silurian sandstone play in Norfolk County.

**Ordovician Play:** Drilling was reported to be complete at 9 exploratory wells and 20 development wells testing Ordovician targets in 2001. Three of the Ordovician exploratory wells were reported to be completed as oil producers in important discoveries that continue the dominance of the Ordovician as the premier oil play in Ontario. Two of these wells were horizontal wells drilled from onshore locations beneath the waters of Lake Erie. TLM No.1 (Horiz.#1) Romney 8-194-TRS is a new pool discovery. TLM No.2 (Horiz.#1) Romney 5-203-I was also completed as an oil producer in what may be a new pool discovery or an offshore extension of the Romney 5-15-I oil pool. TLM No.1(Horiz.#1) Tilbury West 3-2-X was completed as a new oil pool discovery on a strike extension of the fault structure which hosts the prolific Rochester oil pools.

The Ordovician development drilling resulted in 15 new oil producers and 1 gas producer, with 2 wells still under evaluation. Successful oil wells were completed in the Hillman, Mersea 1-16-I, Mersea 5-20-A, Mersea 3-6-V (Wigle), Gosfield North 2-21-VI, Mersea 3-4-IV, Romney 3-8-II, Romney 5-15-I and Lake Erie Romney 203-I pools. All of these wells were drilled by Talisman Energy Inc. One gas well was completed in the Blenheim 8-13-IX pool by Shiningbank Energy Ltd.

**Cambrian Play:** Eight wells were drilled to test the Cambrian in 2001; six exploratory and 2 development. Two development and three exploratory wells were drilled by Shiningbank to test for extensions to the Innerkip gas pool. All five wells were completed as gas producers. Talisman Energy drilled three deep wells in eastern Lake Erie in 2001 to test the Ordovician and Cambrian strata. Two of these wells reached the target formations but did not encounter commercial quantities of hydrocarbons. Drilling of the third well has been suspended prior to reaching the target formation. Drilling is planned to resume in 2002.

**Silurian Reef Play:** There were 7 exploratory tests of Silurian Guelph-Salina reef targets in 2001. Range-St. Clair et al No.1 Enniskillen 4-18-III was reported to have encountered oil and natural gas and is undergoing further evaluation. If completed for production this would be a new pool discovery. The remaining wells were all plugged and abandoned.

There were 19 development tests of Silurian Guelph-Salina reefs in 2001. Ten wells were drilled offshore Lake Erie by Talisman Energy Inc to develop natural gas reservoirs in the Morpeth and Silver Creek platform reefs. All of these wells were either completed for production or reported as potential gas producers. In onshore activity Clearwood Resources Inc drilled two wells on pinnacle reefs in Huron County, completing one gas well in the Hay 5-12-XV gas pool and reporting the other as a potential gas producer in the Dashwood pool. The Consumers' Gas Company completed 3 wells as oil producers in the Corunna and Seckerton North pools and Range Petroleum Corp completed an oil well in the Courtright reef complex.

**Silurian Sandstone Play:** There was a major rejuvenation of interest in Silurian sandstone targets in 2001, as high natural gas prices improved the economics of this low volume gas-dominated play. A total of 11 exploratory and 34 development wells tested Lower Silurian sandstone targets in 2001. All eleven exploratory wells were reported to be gas producers or potential gas producers. Six of these wells were drilled by Echo Energy Inc in exploratory delineation of the boundary of the new Bayham 4-16-I gas pool. GGOL #40 Houghton 8-20-I and GGOL #37 Houghton 3-15-II were drilled by Greentree Gas & Oil as exploratory extensions of the Houghton 7-17-II gas pool. GGOL #41 is a new pool discovery near the pinch-out edge of the Thorold and Grimsby sandstones in Middleton Township. Metalore 90 North Walsingham 1-21-VII is a successful exploratory extension of the extensive Norfolk gas field. Visser #1 Wainfleet 3-11-V was a successful private well drilled as an exploratory extension of the Welland gas field.

Twenty-five development wells were reported as gas producers or potential gas producers. Successful wells were drilled in 5 different pools; South Walsingham 5-6-VI, Bayham 4-16-I, Lincoln, Houghton 8-2-VIII and Houghton 2-13-I. Greentree Gas & Oil was the most active company in the play, accounting for 13 of the new gas wells. Successful wells were also completed by Founder Resources, Metalore Resources, NRG Corp and Echo Energy Inc. Five other wells were completed as private gas wells in parts of the Welland and Haldimand gas fields. Four wells were plugged and abandoned with no production.

**Devonian Play:** Only 1 exploratory well and 1 development well were drilled to test Devonian targets in 2001. Both wells were abandoned. Two wells for disposal of oil field fluids were completed in Devonian strata in 2001.

Preliminary figures for production of oil and natural gas are not yet available.

## RECOMMENDATIONS FOR EXPLORATION

Ordovician reservoirs are still the focus of exploration directed at discovery of new oil reservoirs. Reservoirs located in near-shore locations on Crown land beneath Lake Erie have become very attractive targets in the past two years. Essex County and southern Kent County are still the most attractive onshore locations. Most of the wells drilled in this play utilize horizontal drilling technology.

There still remains considerable untested natural gas potential in Lake Erie and parts of the onshore portions of Haldimand, Norfolk, and Welland counties. If natural gas prices remain high the economics of all the gas plays in Ontario are greatly enhanced, in particular the Lower Silurian sandstone plays both onshore and offshore, and the platform reef play offshore Lake Erie. There is potential for discovery of Cambrian gas or oil pools along the pinch-out edge of the Cambrian sandstone in the subsurface, or in fault-controlled structures. Silurian pinnacle and incipient reefs in Lambton County are also gas-prone and have the additional advantage of potential conversion to natural gas storage.

**Table 1.** Successful exploratory wells in southwestern Ontario, 2001. See Figure 1 for well locations.

Map #	Latitude	Longitude	Well Name	Target	Depth	Results	TD Date
1	43-17-46.8	80-41-8.5	Shiningbank/JEL #88 Blandford 5-3-XIII	CAM	885	GP-ACT	2001/01/23
2	43-12-54.14	80-32-30.11	Shiningbank/JEL #89 Blenheim 7-12-V	CAM	862	GP-ACT	2001/08/27
3	43-19-44.93	80-50-47.59	Shiningbank/JEL #82 South Easthope 1-22-V	CAM	917	GP-CAP	2001/02/04
4	42-11-23.05	82-35-25.64	TLM No.1 (Horiz.#1) Tilbury West 3-2-X	ORD	2050	OP-POT	2001/10/18
5	42-07-52.11	82-22-36.18	Talisman No.2 (Horiz.#1) Romney 5-203-I	ORD	3298	OP-ACT	2001/04/13
6	42-8-49.03	82-20-03.83	TLM No.1 (Horiz.#1) Romney 8-194-TRS	ORD	2214	OP-ACT	2001/09/30
7	42-39-05	80-45-25	Echo 4 Bayham 7-21-II	CLI	432	GP-CAP	2001/07/25
8	42-38-45	80-46-55	Echo 5 Bayham 4-16-I	CLI	430	GP-CAP	2001/05/23
9	42-38-30	80-45-50	Echo 6 Bayham 4-20-I	CLI	438	GP-CAP	2001/06/20
10	42-37-59.94	80-44-06	Echo 7 Bayham 4-26-I	CLI	425	GP-POT	2001/11/13
11	42-38-8.36	80-44-37.38	Echo 8 Bayham 3-24-I	CLI	445	GP-CAP	2001/10/10
12	42-38-43.62	80-44-37.32	Echo 9 Bayham 8-24-II	CLI	430	GP-CAP	2001/10/10
13	42-41-47.30	80-39-45.48	GGOL #37 Houghton 3-15-II	CLI	393	GP-ACT	2001/04/03
14	42-46-19.54	80-38-56.51	GGOL #41 Middleton 4-10-II STR	CLI	425	GP-ACT	2001/09/21
15	42-44-0.616	80-41.07.17	GGOL #40 Houghton 8-20-I	CLI	411	GP-POT	2001/05/15
16	42-43-10.02	80-29-02.94	Metalore No.90 North Walsingham 1-21-VII	CLI	427	GP-ACT	2001/11/16
17	42-57-30	79-20-10	Visser #1 Wainfleet 3-11-V	CLI	197	PGP-ACT	2001/02/15

Figure 1. Successful exploratory wells in Ontario in 2001.

