



MANITOBA'S PETROLEUM INDUSTRY GIS INFORMATION MODULES

Dear Educator

Welcome to the Manitoba Petroleum Industry Information series.

Module 1 will help you become familiar with the software by following step by step instructions to create maps while learning about Manitoba's Petroleum Resources. The lessons are based on real data from the Manitoba Petroleum Branch's GIS database.

You will be able to:

- ◆ Utilize Petroleum resources and internet site located at www.gov.mb.ca/petroleum into your lesson plan to accomplish outcomes in various subjects. GIS is a tool that can help you reach many learning outcomes.
- ◆ Guide your students through the lesson to calculate outcomes with real life Petroleum data resulting in map creation.
- ◆ Use this GIS module to ask other questions and help students become more aware of the infrastructure in Manitoba's Oil Industry.

WHAT DOES THIS MEAN TO MANITOBA AND ITS STUDENTS?

The Oil industry provides employment opportunities in south-west Manitoba. In getting the oil resources out of the ground and into your life, Manitoba's Petroleum Industry creates thousands of jobs for Manitobans, including everyone from clerks, trades people, engineers, geologist and accountants to oil field workers and executives. These people, in turn, spend their salaries on goods and services which provide the lifeblood for countless more employees and businesses. In total, these industries and their spin-off benefits make a major contribution to Manitoba's prosperity and stability.

The oil industry is an important job and wealth generator for Western Manitoba. In 2010 the industry spent \$892 million dollars searching for and developing oil properties in Manitoba. Additionally, the industry paid taxes to three levels of government.

Production in 2010 was a record at 1,871,207.8 cubic metres (11.7 million barrels)

WHY ARE THESE EDUCATION MODULES IMPORTANT?

Through the Petroleum Information Modules, we hope to increase Manitobans' awareness of the wealth and variety of our oil industry and its importance. Each module will explain one or more aspects of the industry and describe the history of development. These modules give students local data and educational

materials to work with which helps expand their knowledge of their own communities and resources surrounding them.

We hope the modules will convey the importance of developing Manitoba's oil resource heritage. For over 60 years, the men and women who are part of the Petroleum industry have made a valuable contribution to the province's growth and prosperity. The story of the industry, from early exploration before the turn of the century to today's sophisticated production and exploration techniques, is a fascinating one.

WHY IS GIS IMPORTANT TO THE PETROLEUM INDUSTRY?

The Petroleum Industry was an early adopter of Geographical Information Systems and a large percentage of employees work with GIS on a day to day basis. We use this information to plot Well locations, Oil Pools, Crown owned Mineral Rights, Flow lines, Pipelines, Oil Facilities, calculate royalties paid to Mineral owners, create maps to post Government Lease Sales and much more.

The majority of the Oil Industry as a whole across North America uses GIS and therefore has become much easier to view up to date information, make decisions based on location, analyze data and submit information in a digital form.

WHAT LESSONS WILL BE COVERED IN THE PETROLEUM INDUSTRY GIS INFORMATION MODULES?

Module - Exploration of the Oil Industry of southwestern Manitoba

This lesson will explore how oil is produced in the Dalrymple-Sinclair oil field and explore the growth and economics of the oil industry in southwestern Manitoba

Module - Following an Oil Lease Sale: from proposal to drilling

As an oil analyst you will be responsible for selecting the appropriate locations, and exploring the permitting process and regulations prior to leasing a land parcel for drilling

Module - Environmental issues and land use of Oil Exploration

Exploring the environmental issues surrounding the exploration, drilling, land use, reclamation and production in an oil field

Module - Well Bore Royalty Allocation of an Oil Lease

Horizontal drilling will be explored and data will be analysed for access and specific land use to determine royalties to crown, private, surface and mineral owners.

Module - Management and Response to a safety emergency

An exploration of a safety emergency where evacuations must take place, safety resources need to be directed. Post emergency mitigation and reclamation process will be followed and analysed, recommending steps and procedures for response.

Module - Subsurface analysis of oil production

An exploration and comparison of the subsurface well bore in directional or horizontal drilling methods, how oil is produced from the various drilling methods and geologic formations

WHICH MANITOBA EDUCATION CURRICULUM WILL BE COVERED IN THE PETROLEUM INDUSTRY GIS INFORMATION MODULES?

Using the 2006 Manitoba Education, Citizen and Youth document “Manitoba Curriculum Framework of Outcomes and A Foundation for Implementation” (Senior 2 Social Studies : Geographic Issues of the 21st Century) the following curriculum outcomes will be covered in these informational modules:

Cluster 2: Natural Resources

Learning Experience 2.3: Sustainable Development

- KC-002 Describe sustainability issues related to natural resource extraction and consumption.
- VP-009 Be willing to consider the implications of personal choices regarding natural resources.

Cluster 4: Industry and Trade

Learning Experience 4.1: Definition and Location

- KE-046 Define the term industry and give examples of primary, secondary, tertiary, and quaternary industries.
- KE-047 Identify factors that determine the location of industry.
- KE-048 Use examples to describe advantages and disadvantages of locating a manufacturing industry in a particular area.

Skills for Managing Information and Ideas

- S-200 Select information from a variety of oral, visual, material, print, or electronic sources, including primary & secondary.
- S-201 Organize and record information in a variety of formats and reference sources appropriately.
- S-202 Select and use appropriate tools and technologies to accomplish tasks.
- S-203 Construct maps using a variety of information sources and technologies.
- S-204 Select, use, and interpret various types of maps.
- S-205 Recognize and interpret various map projections

Critical and Creative Thinking Skills

- S-300 Formulate geographic questions to plan inquiry and research.
- S-301 Consider the context of events, accounts, ideas, and interpretations.
- S-302 Draw conclusions and make decisions based on research and various types of evidence.
- S-303 Reconsider personal assumptions based on new information and ideas.
- S-304 Analyze physical material and evidence during research.
- S-307 Propose and defend innovative options or solutions to address issues and problems.
- S-308 Evaluate information from a variety of sources to determine reliability, validity, authenticity, and perspective.
- S-309 Observe patterns and make generalizations based on geographic inquiry

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I hope you and your students will enjoy working through this lesson.

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