

Apache

IN CANADA



2012



EXPLORING WHAT'S POSSIBLE

The Mist Mountain Coalbed Gas project is a proposal by Apache Canada to assess whether natural gas in British Columbia's Crowsnest Coalfield can be produced in a safe, economic and environmentally responsible manner. Our appraisal plan includes three to five years of environmental studies, technical research and consultation prior to a decision on commercial development.



Why is this project needed?

North American consumer demand for cleaner, environmentally friendly energy options, such as natural gas, is increasing. As conventional reserves of natural gas decline, the development of non-conventional sources, such as coalbed gas is increasing.

Project Location and Resource Potential

The area Apache Canada is evaluating covers approximately 325 square kilometres near the communities of Fernie and Sparwood. The region offers tremendous prospects for natural gas development.

Production over the life of the project could equal 40 years of current demand in B.C.'s Lower Mainland.



Committed to using existing infrastructure where possible

Stakeholder Engagement

One of Apache's core values is to conduct business with respect for people, cultures and traditions. We value the relationships that we have developed with our stakeholders and constantly strive to improve our existing relationships while building and fostering new ones.

Apache Canada promises to:

- Establish and maintain open, timely and informative communication;
- Engage in meaningful dialogue with stakeholders;
- Build relationships by working collaboratively with our neighbours.

Our Commitment

At Apache Canada, we accept our responsibility to produce and consume energy in ways that respect both people and the natural environment; demonstrating environmental leadership, delivering innovative solutions and continually looking for better ways of doing things.

We are committed to a long-term, full life-cycle approach to project planning by:

- * Identifying and understanding environmental and social impacts
- * Consulting with stakeholders
- * Designing the project to avoid, reduce and manage adverse impacts
- * Employing the best coalbed gas practices in North America

Appraisal and Design

We are currently in the appraisal stage, which is expected to take three to five years at a cost of up to \$100 million. The purpose of the stage is to assess the viability of CBG production by proving technologies and practices that will allow for the design of an environmentally sustainable commercial project.

These activities will include:

- Ongoing public consultation, meetings and community updates;
- Apache Canada environmental baseline studies and assessments, including water, wildlife, air emissions;
- Technical Activities, including drilling and production testing of up to 10 appraisal wells per year;
- Design of a potential development program that integrates feedback from ongoing public consultation, environmental studies and the technical activities.



Weather Station used in the project area from 2007-2010



Independent Environmental studies on local creeks and streams.

Development Stage

If the project moves from appraisal and design to development, Apache Canada anticipates being part of the community for more than 50 years.

Commercial development would incorporate the use of multi-well pads, with the potential for up to 10 wells per pad. Our appraisal stage will determine the technical and economic feasibility of this resource.

We expect capital investment over the life of a successful project to reach more than \$3 billion.



Use of existing roads in the project area.

Long-term Benefits

Apache Canada believes that wherever we operate, our activities should generate economic benefits and opportunities for the local area. Should this project proceed to commercial development, benefits could include diversification of the local economy, employment and local business opportunities and a broader tax base for provincial and local governments.

We estimate the project could contribute more than \$2 billion in royalties to the B.C. government and generate more than \$2 billion in corporate taxes over the life of the project.

Building relationships

Apache Canada is committed to establishing a local presence and to being accessible to area residents.

We believe in early and ongoing consultation. We aim to create strong and mutually beneficial relationships with the community, engaging in discussion with a variety of groups. We'd like to hear from you.

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Water Management

Our Commitment

Apache Canada is committed to ensuring that our water management practices do not damage the environment and that they comply with British Columbia Government produced water regulations.

Apache will carefully and responsibly manage both surface and ground water resources.

Apache Canada Water Management

Water management is one of the most significant issues our project team will address.

Currently, we do not know the quality and quantity of water that may be found and accessed in the Mist Mountain coal seams. Our appraisal program will answer these questions. This information, including environmental baseline data gathered during the appraisal stage, will help us establish a long-term water management strategy that protects water resources in the area.

Apache Canada understands the responsibility to manage water produced from our operations and our own water use, while respecting the needs of other water users.

When planning this project, Apache Canada took an integrated approach to water management. This includes:

- Conducting baseline studies on the surface and ground water systems to understand the effect our operation and water management practices would have on the natural environment;
- Monitoring of water resources to continuously build our knowledge of the water system;
- Designing a water management strategy that uses this information to avoid impacts to water systems which enables efficient and responsible water management.

We will monitor our facilities to ensure that they operate to our standards, and that the controls put in place to protect the environment are effective.

Any produced water associated with appraisal activities will be disposed of according to British Columbia Oil and Gas Commission regulations.

Apache Canada's Environmental Baseline Studies

Baseline studies were conducted from Spring 2007 to Winter 2010/2011. Results from the studies will be made available to the public upon request.

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Contractor Requirements

Our Commitment

Apache Canada believes that wherever we operate, our activities should generate economic benefits and opportunities for the local area. We are committed to working with local businesses to prepare them to meet Apache Canada's contracting requirements.

Opportunities

A key measure of success for the project will be the development of mutually beneficial relationships between Apache Canada and local contractors and service providers. These relationships will bring benefits to Apache Canada and the community over the long term, creating jobs, enhancing people's skills, injecting money into the local economy and attracting permanent residents to the region.

Appraisal Stage

Contracting opportunities during appraisal will be limited because of the lower level of activity at this stage. We will work with local businesses when their services are in alignment with our appraisal needs; this will include opportunities in road and well pad construction and a variety of trades.

Development Stage

A commercial project will provide a variety of opportunities for local businesses. While we will not know our exact needs until after the appraisal stage, we do know much of this work will be sourced locally when timing, local resources and business requirements permit. At the end of a successful appraisal stage we will develop a comprehensive procurement supply chain management strategy to maximize local economic development opportunities.

Requirements

Safety is a priority at Apache Canada and all contractors must meet regulatory and corporate operating standards for safety programs.

"Apache is committed to conducting our business in a manner that protects the safety and health of our employees, contractors and the public. We believe that work-related injury and illness are preventable and therefore we strive to continuously improve our safety and health performance." - Apache Safety Policy



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Health and Safety

Our Commitment

Safety is not negotiable and will not be compromised. We are committed to abiding by strict safety standards and regulations to protect the welfare of the public, our employees and contractors.

Keeping People Safe and Healthy

Unsafe practices put people, the environment and project success at risk. That's why designing our facilities and planning our activities to preserve public safety at or near our project sites is of utmost importance to Apache Canada.

We will ensure through planning, training and drills that employees, contractors and visitors at our sites are well informed, well trained and committed to safety. We recognize that safe operations depend not only on technically sound operations and processes but on competent people and an active health and safety culture.

Apache Canada will work with our employees and contractors to promote health and wellness by identifying and minimizing workplace and personal health risk. This includes ensuring compliance with protective clothing requirements, supplying data on the safe handling of products, conducting ergonomic assessments and providing resources to combat stress, among other initiatives aimed at promoting healthy living.



Safety at Apache Canada

The essential elements of Apache's operating culture—individual initiative and sense of responsibility—infuse environmental, health and safety (EH&S) programs across the company's global operations. Apache has established Worldwide EH&S Standards of performance across the company that permit each region to adapt programs and procedures to fit local rules and culture while establishing high standards for training, compliance, maintenance and environmentally responsible operations.

Emergency Response

Like every Apache Canada project, the Mist Mountain CBG project will include a comprehensive Emergency Response Plan (ERP) to protect workers, residents and the surrounding environment.

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Physical Footprint

Our Commitment

We are committed to keeping the footprint of our facilities and activities to a minimum to limit impact. Apache Canada will design, build, operate and maintain all of its facilities in a manner that ensures they will function safely and efficiently. At the end of the life of our facilities, we will remove our surface equipment and reclaim disturbed land. Our aim when we leave any location is to leave a clean environment and a positive legacy.

Potential Physical Footprint

“Footprint” describes the surface area of land directly impacted by a project’s facilities and related activities. For the Mist Mountain CBG project, the scope of our footprint will vary depending on the stage and type of activity.

Appraisal and Design Stage—test wells, pads, roads

We anticipate drilling up to 10 test wells per year during the appraisal activities. Information from these wells will help us learn about the gas and identify the most effective and environmentally responsible extraction technology for site conditions. Our appraisal stage will also determine the technical feasibility of using pads with multiple wells on them (“multi-well pads”) instead of single-well pads to produce the gas.

Development Stage— well pads, roads, pipelines, processing facilities

A successful commercial development could require approximately 100—150 multi-well pads, with up to 10 wells per pad. These pads would connect via a pipeline gathering system to modal compression facilities. There, the gas would be compressed and transferred to one or two processing facilities which, following removal of excess carbon dioxide, would send the gas to the North American natural gas market on the existing TransCanada pipeline.

Limiting Physical Footprint

Apache Canada is a responsible operator. We draw on the best practices available to limit our physical footprint while maintaining safe and efficient operations.

For the Mist Mountain CBG project, we will:

- Maximize the use of previously disturbed land where technically practical in co-operation with surface rights holders;
- Work with others to utilize existing infrastructure and maximize joint-use and minimize new disturbance where possible, e.g. roads and rights-of-way; and
- Plan and design the layout, location and capacity of our facilities to avoid environmentally sensitive areas and to blend aesthetically with the natural surroundings, considering the needs of other users.

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Sub-surface

Our Commitment

We are committed to using the best available technology and expertise to locate and analyze coalbed gas reservoirs and determine the most environmentally and economically feasible methods to develop them.

Why do we think there is gas here?

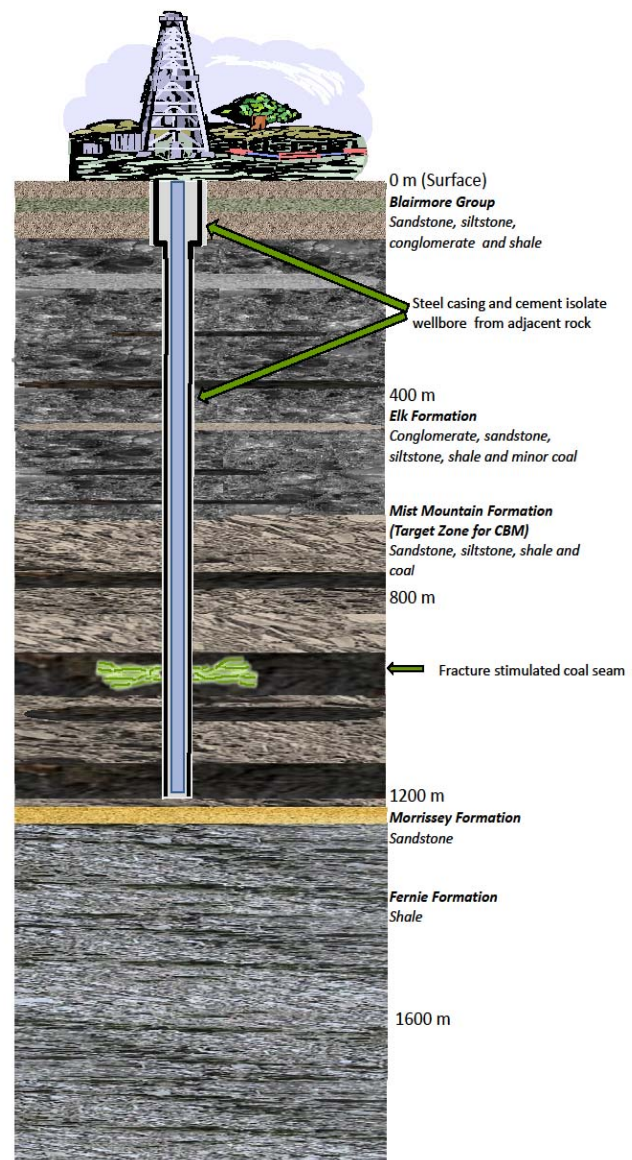
The Crowsnest Coalfield contains high quality coals. The higher the quality, the greater the potential for commercial quantities of natural gas. We won't know for certain how much gas is present until we drill appraisal wells.

This area has many geological challenges. The Mist Mountain coal seams of interest are located up to 1 1/2 kilometres underground. For commercial development, we need to find a coalbed gas field that is of size and quality that is economic.

How do we find the gas?

It will take three to five years of appraisal and design activities to assess and gather comprehensive technical data to learn:

- If the gas is economically extractable
- If it can be produced in an environmentally sustainable manner



Sub-surface

We will use a number of technologies to determine the most viable places to drill our appraisal wells within the project area including:

- Seismic analysis to determine:
 - the depth and layout of the gas-bearing formation
 - an understanding of the location of faults and geological structures
- Coring to get physical samples of the types of coal within the sedimentary layers to learn:
 - How much gas is in a unit of coal—which suggests how much might be in the broader formation
 - If the coal is wet or dry—which will influence our water management strategies

The proposed test wells will confirm the existence, quality and quantity of gas and water in the coals. We will consider various well designs to find out which would work the best with the geological setting. These test wells will also help us determine the best way to reduce the footprint of our wellsites and facilities.

Water and Coal

Some coal seams are dry. Others may be wet, containing fresh or saline (salty) water.

When there is water in a gas-bearing coal seam, a certain amount must be pumped to the surface and withdrawn.



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Air Quality

Our Commitment

We take our responsibility for controlling our air emissions seriously. Apache Canada is committed to limiting and reducing our emissions to minimize their impact on human health and the environment.

Types of Air Emissions

There are two types of emissions associated with the production and processing of natural gas:

- Air Pollutants: Criteria Air Contaminants (CAC): these gases result from the combustion of fossil fuels, related to the use of vehicles, internal combustion equipment and flaring.
- Greenhouse gases: These gases result from natural gas processing, emissions from hydrocarbon-powered equipment and the combustion of fossil fuels.

Running site operations consumes energy. We will continue to research ways to reduce our energy use and associated air emissions to ensure we are responsible and efficient consumers

Apache Canada will evaluate the project's air emissions and impacts through environmental baseline studies, technical assessments and ongoing monitoring. Our management plan will put a priority on reducing or eliminating emissions.

Appraisal stage

To assess the commercial viability of wells drilled during appraisal, we must measure the rate and volume at which the gas flows to the surface. Because we will not have pipelines at this stage to connect wells to processing facilities, we cannot collect this test gas. During appraisal, we will flare or incinerate any gas produced in a clean and efficient manner.

Equipment on-site during the appraisal program will use low-emission technology, such as low-sulphur diesel generators.



Development Stage

If commercial development proceeds, strategies and best practices will be implemented to minimize our emissions based on options assessed during appraisal and design. We will reduce the combustion and venting of fossil fuels on our wellsites and facilities by:

- Assessing options for running our facilities on the provincial electricity grid;
- Assessing options to supplement our energy needs with alternative sources such as wind, solar or micro-hydro power;
- Considering instrumentation options;
- Implementing a leak detection and repair (LDAR) program on facilities to reduce fugitive emissions;
- Committing to a policy of no routine flaring. Emergency flare systems will be designed to ensure a safe efficient, smokeless flare; and
- Where infrastructure is available, wells will be tied into producing line for testing, eliminating emissions of criteria air contaminants and greenhouse gases.

The Big Picture

Apache Canada is committed to reducing our criteria air contaminant and greenhouse gas emissions by pursuing low-emission technology, improving energy efficiency and evaluating alternate methods to develop energy sources.



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Commitment to the Community

Our Commitment

We respect the quality of life and recreational pursuits of residents in the project area and are committed to being a good neighbour. We will maintain ongoing communications with the communities about our activities and plans. We will design our project to minimize disturbance, incorporating feedback from our discussions with communities and recreational users of the proposed project area, as well as our Environmental and Social Impact Assessment.

Travel

We will have a traffic management plan in place during all phases and will co-ordinate major equipment movements with local officials to prevent congestion and hazards.

Dust

We will co-operate with other rights-holders to implement appropriate dust control measures, such as water spraying for construction dust.

Noise

We will develop strategies to address potential noise from construction activities and site operations, such as the use of noise suppression materials at pumping or compressor stations.

Accommodation

Appraisal and Design Stage

We propose to house construction and drilling crews in local motels and small, on-site camps during the three to five years of appraisal activities. We anticipate less than 50 people will be accessing community facilities in Sparwood and Fernie on a regular basis during this stage.

Development Stage

Full-field commercial development, should it proceed, would require a larger construction crew. Prior to development, we will evaluate options for housing these employees with input from residents, businesses and local government.

Operating positions represent long-term permanent jobs. Apache Canada will encourage local hiring and residency for our employees. The activities of our suppliers and contractors will generate long-term employment opportunities for local people as well. These opportunities could also draw permanent residents to the region.

Lighting

We will identify potential light pollution sources from our activities and design our facilities to minimize light disturbance.

Visual Impact Management

We will undertake a landscape and visual impact assessment and design our facilities to conserve the recreational value and natural beauty of the project area.

