#### CONDUCTING IMPACT AS SESSMENT BECAUSE IT IS THE RIGHT THING TO DO: THE WATERTON SEISMIC PROJECT 2003

Prepared by Roger Creasey, M. Sc., P. Biol., Senior Environmental Scientist, Shell Canada Limited, Calgary, AB

Bette Beswick, M. E. Des., P. Biol., Environmental Assessment Specialist, Golder Associates, Calgary, AB

### **Project Overview**

The Waterton area is located in southwestern Alberta. It is a highly diverse landscape. The lower elevations are rolling foothills that provide the rangeland that supports cattle production. The sharp peaks of the Rocky Mountain Front Ranges occupy the higher elevations, and provide habitat for wildlife such as Rocky Mountain bighorn sheep, grizzly bear and golden eagles. Aboriginal vision quest sites speak to the grandeur of the landscape. This entire area is the heart of Alberta's chinook country, where winds from the west can change deep winter into spring-like melts in the timespan of a few hours, and can blow men and equipment off mountain ridges.

The area is also rich in natural resources. After more than 40 years of experience in producing natural gas from the Waterton area, Shell Canada Limited (Shell) has continued to search for new gas reserves along the foothills. In 2003, Shell undertook a 3D seismic program of about 260 square kilometers of this landscape to collect data about further potential reserves in the area. It encompassed about 570 kilometres (km) of source and receiver lines situated in some of Alberta's most spectacular and rugged terrain (Photos 1 and 2).



Photo 1: Terrain features of project area



Photo 2: Line crews laying out equipment for data acquisition

### Shell Canada's Approach

Shell is committed to sustainable development principles in completing the production of natural gas reserves in the area. Shell's biodiversity standard recognizes the importance of biodiversity. For the Waterton 3D Seismic Project, that meant Shell was committed to the following:

- to work with others to maintain ecosystems;
- to respect the basic concept of protected areas; and
- to seek partnerships to enable Shell to make a positive contribution towards the conservation of global biodiversity.

Although an impact assessment was not required to attain regulatory approval to proceed with the project, Shell used environmental assessment as a tool to meet those commitments.

## **Baseline Inventory and Monitoring Programs**

Shell undertook a series of baseline inventory and environmental monitoring programs. These initiatives were intended to contribute information about the environmental and cultural resources in the area, assist seismic crews identify and avoid sensitive features, and establish positive relationships with visitors and residents of the Project area. Those programs were:

- Historical Resources Impact Assessment (Lifeways of Canada Limited, 2003)
- Ungulate Monitoring Program (Anatum Ecological Consulting Ltd. 2003)
- Rare Plant Program (Golder Associates 2003b)
- Avian Monitoring Program (Golder Associates 2003c)
- General Environmental Monitoring (Golder Associates 2003d)
- Public Coordinator to interface with stakeholders, particularly recreational users of the area (Norstrom Field Services 2003)

### **Environmental Protection Plan**

An Environmental Protection Plan (EPP) prior was developed prior to commencing the Project. The EPP (Golder 2003a) focused on objectives related to collecting environmental baseline data, using low-impact seismic technology, minimizing the Project footprint, and educating seismic crews about the environmental sensitivities of the area and the appropriate work ethics for environmental protection. In addition, Shell contracted environmental monitors for the duration of the Project to ensure that the EPP commitments were fulfilled.

Heliportable seismic technology and restricting vehicle access to existing roadways were key elements in limiting the environmental effects of the Project (Photo 3). In addition, sensitive areas such as cultural heritage sites (e.g., vision quest sites) or rare plant locations were flagged and seismic lines were adjusted accordingly to avoid conflicts. Helicopter overflights were directed to avoid disturbing bighorn sheep.



Photo 3: Delivering equipment to ridge top (Credit: Anatum Ecological Consulting Ltd.)

All workers on the Project attended training sessions related to the environment and potential hazards prior to the start of their program component. The training sessions included presentations advising crews of sensitive environmental components (e.g., rare plants, listed or sensitive wildlife) and culturally significant areas, and emphasizing the importance of meeting Shell's environmental commitments.

# **Historical Resources**

A Historical Resources Impact Assessment was undertaken. Field studies focused on examining locations where project activities such as helicopter pads, and seismic source and receiver lines were to be sited. The locations of significant historic and precontact archaeological sites that were found were provided to surveyors, who ensured that the sites were avoided during the program.

Considerable evidence was found that the foothills and mountain ridges in the area were important vision questing locales. Structures include rock cairns, oval and horseshoe structures of coursed stone, and a stone circle. Twenty-eight such structures were recorded: four on foothill ridges, and 24 on mountain ridges and summits. The historical resource significance of these stone feature sites collectively is of provincial, national, and international significance as they are an integral part of the group of vision quest sites recorded in the greater "Crown of the Continent" ecosystem of the Northern Rocky Mountains.

In addition, two presumed eagle trapping pits were found on foothill ridges, reflecting the significance of this area, situated along the Rocky Mountain Golden Eagle Flyway, for traditional eagle trapping.

## Ungulate Monitoring Program

Shell's Waterton 3D seismic program area was situated in critical range for bighorn sheep (*Ovis canadensis*) and occasionally mountain goats (*Oreannos americanus*). About 60% of the seismic program occurred in sheep habitat. Because Shell was concerned about the potential for the program to affect these animals, Alberta Fish and Wildlife's land use guidelines for mountain goat and bighorn sheep range were incorporated into the EPP.

A key requirement of the EPP included wildlife monitoring, particularly for bighorn sheep and mountain goats. Helicopter flight corridors were established and monitored, flight paths were chosen after consultation with an Alberta Fish and Wildlife representative, and helicopters were kept a minimum of 1000 m from sheep or at a distance otherwise established by the biologist. Monitoring for sheep in May and June, prior to starting the seismic program, focused on identifying areas in the seismic program area most frequently used by sheep and confirming lambing success. Habitat data of sheep observation points was also collected. Over the course of the program, there were about 3,000 helicopter flights (average flight lasted 10 to 15 minutes). Biologists documented that 108 helicopter flights (about 3% of the flights) resulted in disturbance to bighorn sheep.

Habitat shifts by sheep during seismic activity appeared to occur. In response, the seismic program was adjusted to create an area of no helicopter activity around a basin with a high concentration of animals and which would be isolated from helicopter activity by rock cliffs and ridges surrounding the basin.

Results from this monitoring program provided a number of outcomes which can be implemented in future heliportable operations in similar terrain.

# Rare Plants

A rare plant program was a component of the Shell Waterton 3D seismic environmental sustainability initiatives. The program had three components:

- rare plant surveys
- seismic crew training
- environmental monitoring

Eight of the 13 previously identified rare plant species were re-located. In addition, 21 species previously unreported in the area were identified (Photo 4). Locations of rare plants that were not locally common were avoided during the survey, and information collected during the program was submitted to public agencies to supplement provincial rare plant information.



Photo 4: Prairie Moonwort (*Botrychium campestre*), one of the rare plant species located within the project area

A short training program was provided to all seismic crew members, primarily to help them understand the relevance of rare plant avoidance to their work. In addition to rare plants, crews were taught how to identify specific tree species (e.g., limber pine) that were to be avoided during limbing programs.

# Avian Monitoring Program

Throughout the duration of the project, a weekly avian monitoring survey was conducted to identify bird species that used the area, as well as identify areas of concern where project design could minimize impact. The project was situated in widely diverse terrain: five natural subregions (foothills fescue, foothills parkland, montane, subalpine and alpine). Terrain types included high plateaus, ridges, slopes with various aspects, and valley bottoms. Observation points were established at 16 locations in the project area. Over 13 site visits, 102 bird species

were identified. No specific recommendations were made during the course of the monitoring program related to the avian survey program.

#### General Environmental Monitoring

The purpose of the environmental monitoring program was to ensure that seismic crews complied with environmental protection measures stipulated in Shell's EPP for the Waterton 3D seismic program (Golder 2003a). From one to three monitors were on-site for the majority of the program.

Environmental monitors provided crews with environmental sensitivity training at project start-up, which provided crews with information they required to understand the importance of EPP commitments. They then worked with seismic crews to help identify and avoid sensitive areas.

# **Project Success**

The Waterton 3D seismic program was completed with minimal environmental impact. The use of heliportable equipment, along with stringent environmental mitigation, including no cutting of seismic lines and routing helicopter flights to avoid sensitive wildlife, achieved the project objectives of protecting biodiversity within the project area.

Although not required, the use of environmental assessment as a voluntary initiative provided the tool to incorporate environmental protection practices into a project which, in other circumstances, could have had significant environmental impacts.

#### References

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