# FINAL TERMS OF REFERENCE

# ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

# FOR THE PROPOSED

# BARAKAT RESOURCES LTD.
# BASELINE MOUNTAIN UNDERGROUND LIMESTONE PROJECT

**Approximately 35 km Southwest of Rocky Mountain House, Alberta**

**Issued By:** **Alberta Environment**

**Date:** **March 3, 2003**

# 1.0 INTRODUCTION

## 1.1 Purpose

The purpose of these Terms of Reference is to provide the public, government agencies and Barakat Resources Ltd. (BRL) with the information requirements needed for preparing an Environmental Impact Assessment (EIA) report. The purpose of the EIA report is to identify and assess the environmental impacts associated with its proposed Baseline Mountain Limestone Project so that government decision-makers may determine whether the Project is acceptable and in the public's best interest.

BRL proposes to develop a new underground limestone quarry using conventional room-and-pillar or sub-level stoping underground mining methods (the "Baseline Mountain Limestone Project", or the "Project"). Annual production will be approximately 600,000 tonnes. The Project is located approximately 35 km southwest of Rocky Mountain House, in Clearwater County. BRL's lease straddles Prairie Creek, Highway 752 and covers a major portion of Baseline Mountain. BRL also has an approved surface quarry located on this lease north of the highway (S1/2 12-37-11-W5M).

## 1.2 Scope of Environmental Impact Assessment Report

The EIA report shall be prepared in accordance with these Terms of Reference and the environmental information requirements prescribed under the *Environmental Protection and Enhancement Act* (EPEA) and Regulations. The EIA report will address:

- All impacts;
- Mitigation options; and
- Residual effects relevant to the assessment of the Project including, as appropriate, those related to the other industrial operations. Impact predictions should be presented in terms of magnitude, frequency, duration, seasonal timing, reversibility, and geographic extent.

It will discuss measures to:

- Prevent or mitigate impact;
- Assist in the monitoring of environmental protection measures; and
- Identify residual impacts and their significance including cumulative and regional development considerations.

The EIA report will form part of BRL's integrated application to the Natural Resources Conservation Board (NRCB) under the *Natural Resources Conservation Board Act* and Alberta Environment under the EPEA and the *Water Act.*

# 2.0 PROJECT OVERVIEW

## 2.1 The Proponent and Project History

Provide the name of the proponent, the name of the legal entity that will develop, manage and operate the Project, a corporate profile, and an overview of the Project.

## 2.2 The EIA Study Area

Provide maps showing boundaries and a legal description of the proposed lease area, the development area and all locations of proposed development activities. Include the lands that will be directly disturbed by the Project or by associated infrastructure as well as cumulative, regional, spatial and temporal aspects for individual environmental components outside the Project Area and lease

boundaries where an environmental effect can reasonably be expected. Illustrate the Study Area on topographic maps and orthophotos.

Include:

- Maps of appropriate scale to identify the proposed development area, the status of land tenure, existing and proposed land dispositions, and the location of infrastructure associated with the Project;
- The location of streams and other geographic information such as natural features and accepted map grids, and lands and waters that may be affected by development within the Project Area or changes to infrastructure as a result of the Project development;
- The rationale used to select boundaries for EIA Study Areas for environmental components; and
- Discussion of how the Study Areas were adapted or modified through the public participation process.

## 2.3 Project Components and Development Schedule

Provide a development plan and overview of the project components that are proposed, including:

- Activities associated with the construction, operation, reclamation and decommissioning of the underground quarry, haul road, and associated infrastructure;
- The phases of the proposed development including construction, operation, reclamation and abandonment; and
- The proposed development schedule for each phase of the Project.

## 2.4 Project Justification and Alternatives

Discuss the need for the Project and consider the implications of proceeding with the Project, specifically addressing the following:

- The type of limestone and the market that the product is intended to supply;
- Alternative methods of mining the limestone;
- Existing and alternative Project infrastructure;
- An overview of any alternatives considered economically feasible; and
- The implications of development for potential future developments in the Project Area.

## 2.5 Regulatory Review

Identify all regulatory approvals applicable to the Project, including environmental and operational approvals at the municipal, provincial and federal levels. Summarize government policies, resource management, integrated resource plans, and planning or study initiatives pertinent to quarry development and discuss their implications for the Project.

## 2.6 Summary of EIA Report

Summarize the EIA report including environmental and socio-economic implications of key construction and operation activities associated with the Project, proposed mitigation strategies, residual impacts, monitoring programs, cumulative effects and any follow-up programs required.

Include a glossary of terms and a list of abbreviations to assist the reader in understanding the material presented. Include tables that cross-reference the report to the EIA Terms of Reference and to any current applications submitted pursuant to the EPEA and the *Water Act.*

# 3.0 PROJECT DESCRIPTION

## 3.1 Site Development

Describe the site selection, project components and process for the proposed facilities including the following:

- The economic, technical and environmental factors that contributed to the decision-making process for development within the Project Area;
- The site selection process for new infrastructure such as location of the portal, buildings, power line and access road. Indicate the technical, geotechnical, economic and environmental criteria considered;
- The general quarry development activities and schedules that characterize the construction, operation, reclamation and abandonment phases;
- The proposed quarrying methods, quarry design criteria, development activities and schedules for the Project, including activities such as timber clearing, soil salvage, portal pad development, haul road construction, limestone handling, and reclamation;
- Maps and diagrams at appropriate scale to illustrate the development plan, portal area, water management systems, associated infrastructure and reclamation plan; and
- Specific activities that will be undertaken to prevent or reduce the potential for adverse environmental or social impacts through the quarry planning process.

## 3.2 Infrastructure, Utilities and Transportation

Describe infrastructure components, proposed and existing, for the development within the Project Area. Descriptions of infrastructure will include the following:

- Public and worker access;
- Utilities;
- Limestone handling and transport;
- Limestone preparation and stockpile;
- Components identified through public participation program;
- Location plans for infrastructure such as processing, stockpile, office, waste management facilities;
- The anticipated changes to traffic (e.g., type and volume) on public roads, from the project site, during the construction and operation of the Project. Discuss and evaluate any expected impact and suggest any required mitigative measures;
- How the materials will be moved to the markets;
- How watercourse crossings will be handled;
- Consultation with local transportation authorities and other stakeholders, including any transportation studies that are underway or planned; and
- How public access to, or within the Project will be managed for each phase of the Project.

## 3.3 Air Emissions Management

Identify all potential sources of emissions from development within the Project Area, for each source:

- Describe the emissions (total particulates, $PM_{10}$, $PM_{2.5}$, $NO_X$, $CO_2$, and metals) from the quarry including emissions from mining, operating equipment, vehicles, ventilation, heating, road, crusher and other facilities;
- Describe the monitoring and control systems that BRL proposes to use; and
- Describe the management program to address all relevant fugitive dust and other emissions.

### 3.4 Water and Wastewater Management

Identify the process and potable water requirements for the Project including start up and emergency operation conditions. Describe water treatment requirements and any chemicals that BRL plans to use, and:

- Identify potential sources of water quality concerns associated with the Project;
- Describe plans to monitor and prevent or reduce impacts on water quality;
- Provide descriptions and drawings for water management facilities;
- Quantify water diversions from surface water or well water systems to meet process and potable water requirements, indicate the source of the water and release locations; and
- Provide a summary of BRL's management plan to prevent or reduce impacts to surface water flow, and a spill response plan should an accidental release occur.

### 3.5 Hydrocarbon, Chemical and Waste Management

Provide a waste management plan for the proposed processing operation, including information on waste quantities, storage, handling and disposal methods for each waste type, and:

- Potential sources of industrial waste associated with the Project;
- The location and amount of all chemicals stored on site with a description of containment and environmental protection measures;
- Identify the location, nature and amount of on-site hydrocarbon storage. Discuss containment and other environmental protection measures. Demonstrate how selected practices comply with the provincial and federal regulations;
- Classify and characterize wastes in accordance with EPEA's waste management requirements; and
- Describe BRL's plan to minimize and recycle industrial wastes.

### 3.6 Monitoring, Operating and Contingency Plans

Summarize the key elements of BRL's environmental, health and safety programs, and describe corporate policies and procedures, operator competency training programs, spill and emission reporting procedures, and emergency response plans.

### 3.7 Reclamation and Closure

Provide a conceptual site abandonment and reclamation/closure plan for the Project Area, including:

- Reclamation methods relative to drainage control, land stability, soil salvage, soil replacement, revegetation and interim land management;
- Criteria for salvaging soils for reclamation, based on the availability and suitability of soils;
- An estimation of volumes of soil available for salvage, with a reconciliation of soil replacement requirements for reclamation;
- The soil handling and replacement plan for the Project Area;
- Identify reclamation and land use objectives and describe how the reclamation plan will meet those objectives;
- A discussion of plans for abandonment including how the adit will be closed and/or sealed;
- An outline of the reclamation schedule and a description of how reclamation success will be measured and evaluated;
- A revegetation plan including seed mixes, timing, monitoring, interim land management (erosion control) and weed control;
- A site diagram showing post reclamation site conditions including topography, surface drainage, final vegetation and other significant features; and
- The anticipated differences between pre- and post-development landscape or vegetation types, wildlife habitats, aesthetics, traditional uses, recreation use, or commercial forest operations.

# 4.0 ENVIRONMENTAL ASSESSMENT

## 4.1 Assessment Requirements

Provide information on the existing environmental resources and resource uses that could be affected by development. Identify the environmental components potentially affected by the Project.

Describe and rationalize the selection of key indicators selected. These environmental indicators will be used to estimate the scale of impact and to evaluate the appropriateness of the environmental management programs.

For each environmental component and indicator:

- Describe the existing baseline condition;
- Identify the activities associated with the Project Area that have the potential to affect the environmental component and indicator being considered;
- Describe the nature of the environmental effects associated with the Project, including information on magnitude, probability of occurrence, frequency, extent, duration and seasonal timing for each environmental effect;
- Present environmental protection plans to prevent, minimize, or mitigate negative environmental effects from the Project;
- Present plans to identify, monitor and manage potential environmental changes in order to demonstrate that the Project will operate in an environmentally sound manner over the life of the Project; and
- Where appropriate, for any of the above, provide maps and figures to illustrate the information presented.

## 4.2 Cumulative Environmental Effects

To assess the cumulative environmental effects:

- Describe the methodology used to identify and assess the cumulative effects and provide the detail as to how conclusions were drawn;
- Define the Study Area's spatial and temporal boundaries for each environmental component and indicator examined;
- Assess the reasonably-foreseeable environmental effects of the proposed Project in combination with other existing and proposed Projects, activities and land uses in the region;
- Assess the appropriateness of information from other developments used and identify any deficiencies or limitations in the information; and

## 4.3 Land Use

Provide the following:

- The existing land uses in the Study Area including industrial (coal, oil and gas, quarries, forestry), commercial (outfitting, trapping, grazing lease, water bottling well/plant), recreational (hunting, fishing, off-road vehicle, hiking, camping, horse riding), and traditional (Aboriginal) uses;
- A list of mineral and subsurface leases and leaseholders in proximity to the proposed Project.
- The Aboriginal community's traditional use of the land affected by the Project (including hunting, fishing, trapping and cultural activities);
- Any unique sites or special features in the Study Area;
- The land use interests of other groups or community initiatives;
- Description of the land use and resource policies and planning initiatives in the Study Area, including the Eastern Slopes Policy and the Nordegg-Red Deer River Sub-Regional Integrated Resource Plan (IRP);
- A discussion of the consistency between the zoning in the IRP and the proposed development;

- Components of the Project that have the potential to affect other land uses and discuss the nature and significance of the effects on those land uses;
- The aesthetic impacts of the Project on regional recreation activities and public land uses during and after development;
- Mitigation strategies to address these anticipated impacts, and outline BRL's management capacity to implement these strategies;
- The public participation program and plans to mitigate impacts with the existing land users;
- Describe the effects of increased traffic on transportation routes;
- The cumulative effects of the Project relative to other existing or proposed projects on regional and public land uses, including outdoor recreation, during and after development; and
- The plans to mitigate the effects of the Project and alternatives considered.

## 4.4 Climate, Air Quality and Noise

Discuss the baseline climatic and ambient air quality conditions. In addition, provide the following information:

- Components of the Project that will affect air quality both locally and regionally;
- Air quality components of concern, including emissions from point sources, fugitive dust, construction, and vehicles;
- Possible effects from the deposition of primary particulate matter and impacts on surface water, soil and vegetation;
- The nature and significance of changes in ambient air quality expected as a result of the Project and the impacts associated with these changes. Discuss how air emissions will likely disperse in the valley. Describe methodology used to determine changes in ambient air quality, justify the methodology used, and identify any shortcomings or constraints on the findings;
- A plan to minimize dust emission levels from the Project;
- The nature and significance of changes in noise levels as a result of the Project;
- The implications of increased noise levels and proposed measures to minimize noise resulting from the development. This will be done considering magnitude, frequency, duration and time of day and the performance potential of these measures;
- Cumulative effects of the Project in combination with other activities in the regional Study Area; and
- Mitigation and monitoring measures to address climate, air quality and noise concerns.

## 4.5 Geology, Terrain and Soils

Describe and map, on an appropriate scale, the geology, terrain and soils, and drainage patterns of the Project Area. Provide the following:

- An orthophoto as a base for a biophysical map of the Study Area, for the mapping of terrain and soils;
- An evaluation of the sensitivity of soil materials and landforms in the Project Area to erosion;
- The components of the proposed development that have the potential to affect geology, terrain and soils;
- The nature and significance of the anticipated changes to the pre-development topography, elevation, drainage patterns and soils that will result from surface disturbance at the site and any potential for subsidence;
- An evaluation of the geoglogical stability of the area including the frequency and magnitude of earthquakes in the area;
- A soil management plan to ensure proper soil salvage, storage and replacement when required for reclamation;
- Cumulative effects of the Project in combination with other activities in the regional Study Area; and
- Mitigation measures to be implemented to reduce impacts of effects.

## 4.6 Vegetation and Forest Resources

Provide a vegetation and forest resources plan that includes the following elements:

- Describe and map, to an appropriate scale, the vegetation communities in the Project Study Area;
- Describe and evaluate the forest resources affected by the Project development, using the current standard evaluation method in the Alberta Vegetation Inventory Standards Manual (AVI) Version 2.2;
- Identify the components of the Project development that have the potential to affect vegetation and forest resources;
- Discuss the mitigation measures to be implemented to minimize impacts on vegetation and forest resources;
- Identify rare, threatened or endangered plant species or communities as found on the COSEWIC and provincial vegetation policy documents, and their associated habitat requirements;
- Describe measures to avoid or minimize disturbance to rare plant species and communities, and
- Identify cumulative effects of the Project in combination with other activities in the regional Study Area.

## 4.7 Wildlife

Provide the following:

- Wildlife habitat types, quality and wildlife use in the Project Area;
- Identify potentially significant wildlife species, and associated habitat requirements, as listed by COSEWIC and provincial wildlife management policy documents;
- Identify the components of the Project that have the potential to affect wildlife, wildlife habitat use and habitat quality;
- Identify indicator species in the Project Study Area if they assist in the understanding of the impacts of the Project;
- Identify the predicted effects of the Project on wildlife, wildlife habitat and habitat quality during and following reclamation;
- A mitigation plan to minimize wildlife habitat loss and disturbance to wildlife;
- Describe access controls or other management strategies to protect wildlife; and
- Identify cumulative effects of the Project in combination with other activities in the regional Study Area.

## 4.8 Surface Hydrology

Describe the following:

- The surface drainage patterns and surface water hydrology of the regional Study Area;
- Identify the infrastructure that will be used to meet drainage, process water, fire protection, and sewage treatment requirements;
- Identify wastewater effluent, groundwater dewatering and runoff from the Project Areas (source, volume, timing and discharge locations) during and after the life of the Project;
- Describe the alterations in surface drainage patterns at the Project, the impacts of these changes on downstream areas and how these impacts will be mitigated and monitored;
- Discuss probable maximum flood and maximum precipitation events relative to design of water management systems, where applicable, and flood contingency plans; and
- Identify cumulative effects of the Project in combination with other activities in the regional Study Area.

## 4.9 Surface Water Quality

Identify the following:

- Describe baseline water quality conditions in the Project Area with reference to the appropriate water quality parameters, their seasonality and relationship to flow and other controlling factors;

- The activities that have the potential to affect surface water quality and aquatic communities during the life of the Project;
- Assess the magnitude of the potential impacts of activities on surface water quality. Determine the local and regional extent of potential impacts as well as their frequency, duration, magnitude and seasonality. Assess the magnitude of each potential impact on water quality relative to existing water quality and accepted water quality guidelines;
- Describe the proposed mitigation and monitoring measures (water management and waste water management treatment systems) to protect water quality; and
- The cumulative effects of the Project in combination with other activities in the regional Study Area.

### 4.10 Groundwater

Describe the following:

- Provide an overview of the existing hydrogeological setting in the Project Area, including: a description of aquifers, hydraulic characteristics, groundwater quality, and the interaction of surface water and regional/local groundwater flow;
- Identify the components and activities of the Project that have the potential to affect groundwater resources;
- Identify potential impacts to groundwater quality and quantity from various Project activities;
- The nature and significance of the predicted effects of the Project on groundwater during and after the life of the Project;
- Discuss groundwater discharges to watercourses in terms of volumes, rates, timing and duration, and the potential for interruption of groundwater flows to surface water systems;
- The post-mining groundwater regime with an assessment of the nature and significance of changes from the pre-mining condition;
- The proposed mitigation and monitoring measures to minimize impacts on groundwater; and
- Identify cumulative effects of the Project in combination with other activities in the regional Study Area.

### 4.11 Fisheries

Provide the following:

- The fisheries resource in the Project Study Area, including species composition, distribution, relative abundance, seasonal habitat, movement patterns and general life history patterns;
- Identify critical or sensitive habitat such as spawning, rearing, over wintering and migration areas, with reference to species' distributions;
- Identify potential groundwater upwelling and their significance to fisheries;
- Identify the components and activities associated with the Project that have the potential to affect the fisheries resource and habitat during and after the Project development;
- Discuss the nature and significance of the predicted impacts, their duration and their spatial extent (site-specific, local, or regional);
- A proposed mitigation plan to minimize effects on the fisheries resource and habitat; and
- Identify cumulative effects of the Project in combination with other activities in the regional Study Area.

## 5.0 HISTORICAL RESOURCES AND TRADITIONAL USE ASSESSEMENT

Describe the following:

- Detail consultation with Alberta Community Development and Aboriginal communities and provide a Historical Resource Impact Assessment (HRIA) for the Project. Provide Alberta

Community Development with a copy of the HRIA report discussing the results of the HRIA prior to or at the same time as the submission of the EIA report to Alberta Environment.
- Summarize previous historical resources and traditional use assessment work;
- Provide a review of palaeontological, archaeological and historical resources and Project impacts on these elements;
- Assess the impacts of the Project on traditional land uses; and
- Discuss how potential impacts to traditional uses will be mitigated.

## 6.0 SOCIO-ECONOMIC INFORMATION

Discuss the nature and significance of the operations in the Project Area on the regional and local socio-economic conditions and the impacts associated with these effects, including consideration of the following:
- workforce;
- local employment and training;
- opportunities and procurement;
- local services and infrastructure;
- timing and size of workforce during construction and operation;
- tourism, recreation, hunting, trapping and fishing; and
- population changes;

- Discuss corporate policies and programs respecting the use of local, Alberta and Canadian products and services, including an estimated breakdown of Alberta, other Canadian and non-Canadian industrial benefits for Project management/engineering, equipment and materials, construction labour, and total overall benefits of the proposed development;
- Discuss the socio-economic implications of not proceeding with the Project; and
- Identify the measures proposed to enhance positive effects or mitigate negative effects.

## 7.0 PUBLIC HEALTH AND SAFETY

Describe aspects of the Project that may have implications for public health and safety and:
- Describe plans to prevent or minimize the potential for adverse impacts on public health and safety;
- Identify concerns, if any, raised by the public during the environmental assessment process with respect to health and safety; and
- Provide a summary of the emergency response plan and discuss mitigation plans that will be implemented to ensure workforce and public safety during construction and operation of the Project.

## 8.0 PUBLIC PARTICIPATION PROGRAM

Describe the following:
- Document the public participation program for the Project, including consultation with Aboriginal communities;
- Public participation methods, timing, and the type of information provided to the public;

- Summarize the issues identified during the public participation process including the views of the various parties with respect to these issues;
- Include a list of the stakeholders that were represented during the public participation process;
- The responses to issues or concerns raised during the public participation program; and
- Discuss public input that has been incorporated into the proposed Project design, environmental management systems, mitigation plans, and monitoring programs.