STRATHCONA-WESTMIN

PROVINCIAL PARK

MASTER PLAN

December, 1995

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District Manager
Strathcona District

Approved: Moe Sihota Date: 96-02-21
Minister
Environment, Lands, and Parks

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Section One: PLAN HIGHLIGHTS

- Strathcona-Westmin Provincial Park is a 3,328 ha Class "B" Provincial Park established to recognize an operating mine, the Myra Falls Operation of Westmin Resources Ltd.. The Park is geographically contained within the boundaries of Strathcona Provincial Park[11].

- The Class "B" Park is an interim status and will remain only as long as the mine is in operation. As portions of the Park are no longer needed for mining activities, they will be added progressively to Strathcona Provincial Park.

- The goal of this Master Plan is to accommodate the mine and, at the same time, protect the natural resources and provide recreation opportunities within the Park.

- Park zoning has been modified to reflect the unique purpose of this Class "B" Park. A Non-Conforming Use Area was included as well as an Intensive Recreation Zone, a Natural Environment Zone and a Special Feature Zone.

- Several branches of government have authority to issue orders to Westmin Resources Ltd.. There is a potential for conflicting orders to be given. The plan recommends formation of a field level working group, composed of local representatives of agencies and coordinated by BC Parks, to ensure clear direction is given to Westmin Resources Ltd.

- The Plan recommends extension of the Strathcona Advisory Committee's mandate to include Strathcona-Westmin for the purposes of public consultation.

- A herd of elk reside in the lower Thelwood valley. This represents the only known herd entirely resident in Strathcona and Strathcona-Westmin Provincial Parks. All human activities, including industrial, will be monitored to ensure that the presence of elk is not threatened.

- The Park has some moderately significant recreational features. However, key backcountry opportunities in adjacent Strathcona Provincial Park are accessed from the Park. BC Parks and Westmin Resources Ltd. will work together to ensure that mine operations do not inhibit this access.

[1] In this plan “the mine” refers to Westmin Resources Ltd.’s Myra Falls Operations, “the Park” refers to Strathcona-Westmin Provincial Park, and “Mine Operator” refers to Westmin Resources Ltd.

- Recreational facilities will be upgraded to the same standard as those of adjacent Strathcona Provincial Park. New facilities are recommended, including: parking at the Price/Cream Trailhead, a backcountry campsite at Arnica Lake, portions of a loop trail and trailhead connecting Bedwell Lake to Cream Lake and the lower Thelwood Valley, and if supported by an impact assessment, a self-guided interpretive trail in the lower Thelwood Valley.

- Overall direction for management will be to protect the Park's recreation and conservation values while not imposing undue restrictions on the mine's operation.

- One objective of the approved Strathcona Provincial Park Master Plan is "To eliminate the existing reservoirs at Jim Mitchell, Thelwood and Tennent Lakes once these are no longer needed by Westmin...". Through a review of reclamation and decommissioning plans, this Plan will ensure that this objective is achieved by returning the Strathcona-Westmin lands to a condition representative of their state prior to flooding.

Section Two: INTRODUCTION

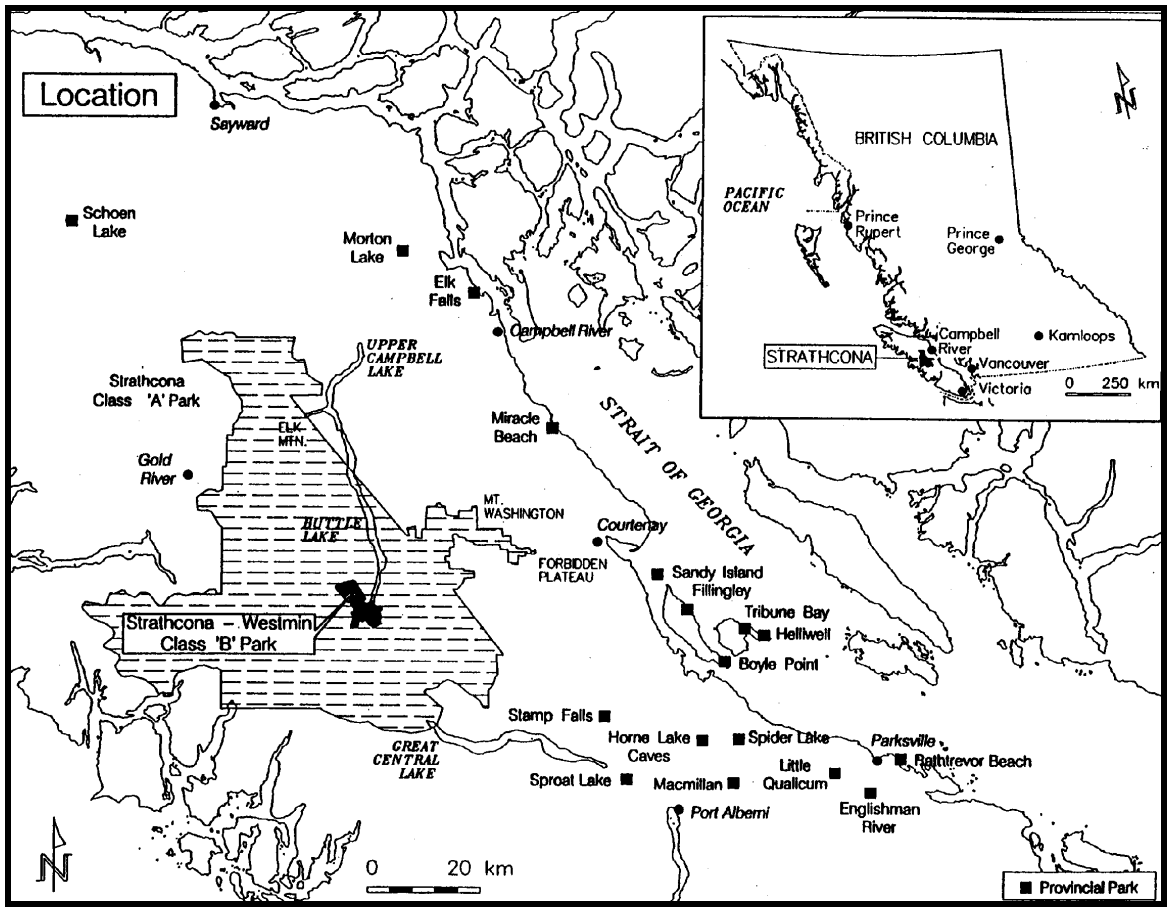
Strathcona-Westmin Provincial Park (Figure 1) is surrounded by Strathcona Provincial Park and represents an area 2% the size of Strathcona Provincial Park. The Master Plan for Strathcona Provincial Park was approved in 1993 and defines land use and development for areas adjacent to Strathcona-Westmin Provincial Park. Accordingly, the Strathcona-Westmin Master Plan must recognize the direction and constraints that the Strathcona Provincial Park Master Plan places on land use and ensure that the actions specified in this plan have a minimal effect on Strathcona Provincial Park.

Strathcona-Westmin is a unique situation as no other provincial park contains an operating mine, and it is expected that the mine will operate for the foreseeable future. Westmin Resources Ltd. is committed to developing a cooperative working relationship with BC Parks in meeting the Park's conservation and recreation goals. As an active participant in management of the Park the mine operator acknowledges the special responsibilities of operating in a provincial park, and is committed to carrying out its general mining activities in a manner which is appropriate in a sensitive area.

BC Parks has the overall responsibility for managing the lands within the Park, but this role cannot be accomplished in isolation. The administration of regulations affecting the mine and mining operations involves the cooperation of many agencies including the Ministry of Energy, Mines and Petroleum Resources, Environmental Protection (Ministry of Environment, Lands and Parks), Department of Fisheries and Oceans, and Environment Canada. Through their enabling legislation, each of these agencies has jurisdiction over the mine site. Communication and co-operation between agencies, BC Parks and Westmin Resources Ltd. is essential to the protection and management of the Park's resources.

The boundaries of the Park have been Ltd. to the area of the mining leases held by Westmin Resources Ltd.. These are not natural boundaries. Mining activity could effect the natural and recreational environment of Strathcona Provincial Park by reducing air and water quality or increasing noise levels and the amount industrial traffic on public roads. Assessment and management of activities, including environmental and socio-economic factors, will consider the impacts on Strathcona Provincial Park and will detail ways to minimize these impacts.

Figure 1


Location
Sayward
Schoen Lake
Morton Lake
Elk Falls
Campbell River
UPPER CAMPBELL LAKE
Strathcona Class 'A' Park
ELK MTN.
Gold River
Miracle Beach
STRAIT OF GEORGIA
MT. WASHINGTON
HUTTLE LAKE
Courtenay
FORBIDDEN PLATEAU
Sandy Island
Fillingley
Tribune Bay
Hellwell
Boyle Point
Strathcona - Westmin Class 'B' Park
Stamp Falls
Horne Lake Caves
Spider Lake
Parksville
Rathtrevor Beach
GREAT CENTRAL LAKE
Sproat Lake
Macmillan
Little Qualicum
Englishman River
Port Alberni
0 20 km
Provincial Park
BRITISH COLUMBIA
PACIFIC OCEAN
Prince Rupert
Prince George
Campbell River
Kamloops
STRATHCONA
Vancouver
Victoria
0 250 km

Much of this plan is based on information and public input generated by the public process to develop the Strathcona Provincial Park Master Plan. This process was directed by the Strathcona Steering Committee, a group made up of public and BC Parks representatives.

Though Strathcona-Westmin Provincial Park is intimately related to Strathcona Provincial Park, a decision was made during the preparation of the Strathcona Provincial Park Master Plan, to deal with Strathcona-Westmin in a separate process due to the unique purpose of the Strathcona-Westmin Provincial Park. The preparation of this plan was delayed pending approval of the Strathcona Provincial Park Master Plan.

The two parks are further entwined as a result of Westmin Resources Ltd. holding Park Use Permits for non-mining activities within Strathcona Provincial Park. These permits are related to power and water supply to the mine, and as such, are managed through the Master Plan for Strathcona Provincial Park - which identifies several actions related to these permit areas; in particular, the removal of the reservoir function of Jim Mitchell, Thelwood and Tennent Lakes.

The Strathcona Steering Committee provided general direction and input to this plan. Due to the specialized and complex nature of many of the issues, a technical advisory group made up of representatives of the Ministry of Energy, Mines and Petroleum Resources; Ministry of Environment, Lands and Parks; Westmin Resources Ltd.; and the Department of Fisheries and Oceans was formed to help prepare this plan.

Purpose of the Plan

A park master plan provides specific short-term direction for management and a long-range vision for a park. By stating the goals and objectives for a park a master plan functions both as a working document used by park managers to guide their operation of a park, and an information document informing the public as to how each component of the park system will be managed.

Master plans are based on current knowledge and values. Because these are subject to change, plans are periodically reviewed (in most cases at five-year intervals) to ensure that the stated directions and vision continue to be sound.

Specific actions detailed in the plan are based on objectives which flow from the role and goals defined by the vision statement for the Park. Actions are further refined and scheduled as the final step in the plan which prioritizes the actions for implementation.

The plan for Strathcona-Westmin Provincial Park is unique. The Park was established as an interim measure in order to accommodate the presence of an active mine within Strathcona Provincial Park. Strathcona-Westmin Provincial Park will exist only while the mine is in operation and current mineral rights are extant. This role focuses the scope of this plan.

Planning Issues

The Park was designated as a Class "B" Park to recognize the government's long-term decision to allow mining to continue in Strathcona-Westmin Provincial Park. However, a key objective is retention of the Park's resources in as close to a natural state as possible. Once mining ceases and the mine is closed, the lands will be re-integrated with Strathcona Provincial Park. Until that time, the company may continue to exercise its legal rights within the Park boundaries. Key issues relate to how these rights are exercised and how the Park's (including adjacent portions of Strathcona Provincial Park) resources and opportunities are managed and protected.

a) Relation to Strathcona Provincial Park Master Plan - The Strathcona-Westmin Provincial Park Master Plan must complement the Strathcona Provincial Park Master Plan; especially its zoning, natural resource management and park development.

b) Park Use Permit - Mine Operation and Development - Westmin Resources Ltd. holds three Park Use Permits (1261, 1363, and 1364) to cover the Myra Falls Operation. The permit area includes portions of both Strathcona and Strathcona-Westmin Provincial Parks. These permits authorize the use of park lands for mining, power generation, power transmission, and roads.

Existing Park Use Permits require ongoing review to ensure that mine operating covenants are adequate to protect environmental quality and reflect Park objectives. These covenants should address acid rock drainage, surface disturbance, short term reclamation, noise, research needs, mine traffic, environmental monitoring, protection of park features and wildlife, agency roles, and the impact on Strathcona Provincial Park. Any proposed amendments to the existing permit will have to be negotiated with Westmin Resources Ltd..

Other permitting agencies include Ministry of Environment, Lands and Parks' Environmental Protection and Water Management Branches and Ministry of Energy, Mines and Petroleum Resources' Mine Review and Permitting and Mine Health and Safety Branch.

c) Mine Operations - In British Columbia, a mine may go through several phases:

Exploration and Development Phase

The first phase is the exploration and development stage. The Myra Falls Operation of Westmin Resources went through a long period of exploration beginning in the early 1900's. Development did not begin until 1963.

Production Phase

A mine goes into production, this is an indefinite stage lasting until the mine is no longer economically viable or the ore deposit is fully extracted. This is the active life of the mine.

Closure and Reopening Phase

Thirdly, a mine may temporarily close. There may be a period when the mine is alternately closed and then reopened depending on market conditions (i.e. metal prices).

Final Closure and Decommissioning Phase

The final stage is closure. This stage is reached when the Company no longer wishes to continue to mine and relinquishes the right to extract ore.

The Myra Falls Operation of Westmin Resources is an active mine and, under present conditions, will be active for the foreseeable future. Westmin Resources Ltd. is a long-term resident of Strathcona-Westmin Provincial Park. The presence of an active mine in a provincial park presents mine and Park managers with many challenges, and many opportunities for cooperation.

Final closure does not mean the end of involvement by the Company. There will be an ongoing environmental liability including a need for reclamation monitoring and management.

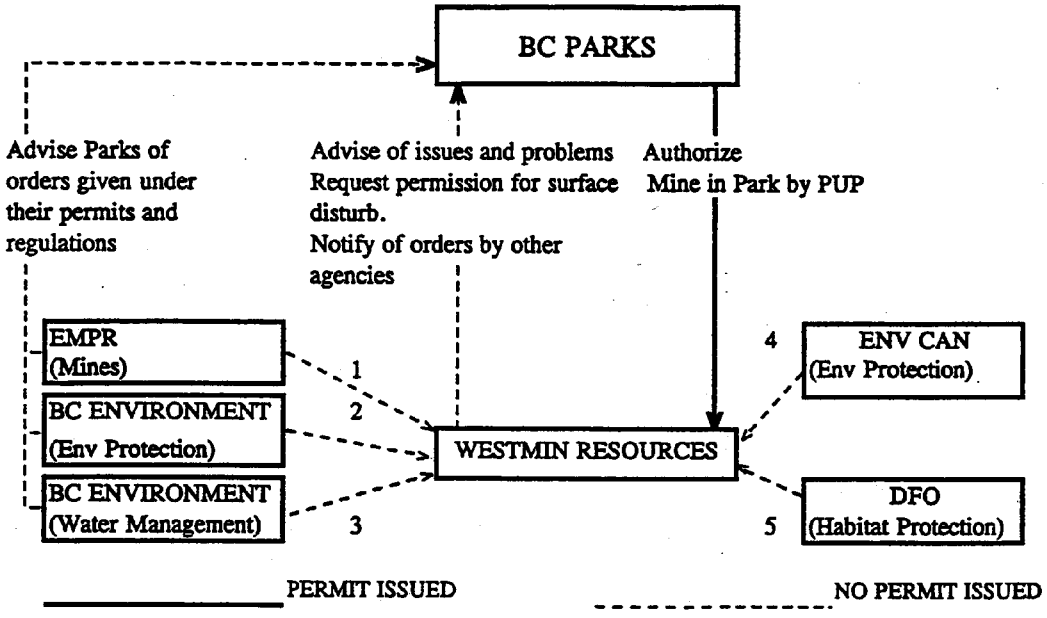
d) Mine Reclamation - Reclamation is a continuous process. Implementation of the reclamation plan is based on an annual work plan. Reclamation conditions will reflect the requirements of the Ministry of Energy, Mines and Petroleum Resources' Reclamation Permit M-26 with guidance from the Ministry of Environment, Lands and Parks (BC Environment and BC Parks), Department of Fisheries and Oceans and Environment Canada through the Vancouver Island Mine Development Review Committee.[2] Appendix E provides a summary of Reclamation Permit M-26.

e) Interagency Cooperation - The overlapping jurisdictions and potential for broader ecological consequence require that working relationships be defined and formalized. Figure 2 summarizes the roles and relationships of the agencies involved.

[2] The Vancouver Island Mine Development Review Committee is an inter-agency committee chaired by Ministry of Energy, Mines and Petroleum Resources with representatives from the Ministry of Forests; from each branch of the Ministry of Environment, Lands and Parks; Ministry of Agriculture and Fisheries; Department of Fisheries and Oceans; Environment Canada, and the Ministry of Transportation and Highways, and is charged with reviewing mineral exploration and mining applications on Vancouver Island.

Figure 2

AGENCY RELATIONSHIPS



BC PARKS

- Authorizes mine to use parkland with a park permit
- Ensures that conditions of Park Use Permit are met

[1] ENERGY, MINES AND PETROLEUM RESOURCES (EMPR) - STATUTORY AUTHORITY FOR:

- Issuance of mineral lease
- Approval of mining plans, reclamation plan
- Monitoring compliance
- Administration of mining regulations
- Setting and administering bonding
- Chairing Vancouver Island Mine Development Review Committee

[2] BC ENVIRONMENT, ENVIRONMENTAL PROTECTION - STATUTORY AUTHORITY FOR:

- Authorizing discharge of air contaminants, solid waste and effluent from mine and mill
- Administration of provisions of ***Waste Management Act***
- Monitoring compliance with Waste Management; permit and bonding under review

[3] BC ENVIRONMENT, WATER MANAGEMENT - STATUTORY AUTHORITY FOR:

- Authorizing the use of water by the mine, including impundments for hydro-electric generation

[4] ENVIRONMENT CANADA, ENVIRONMENTAL PROTECTION

- Monitors water quality

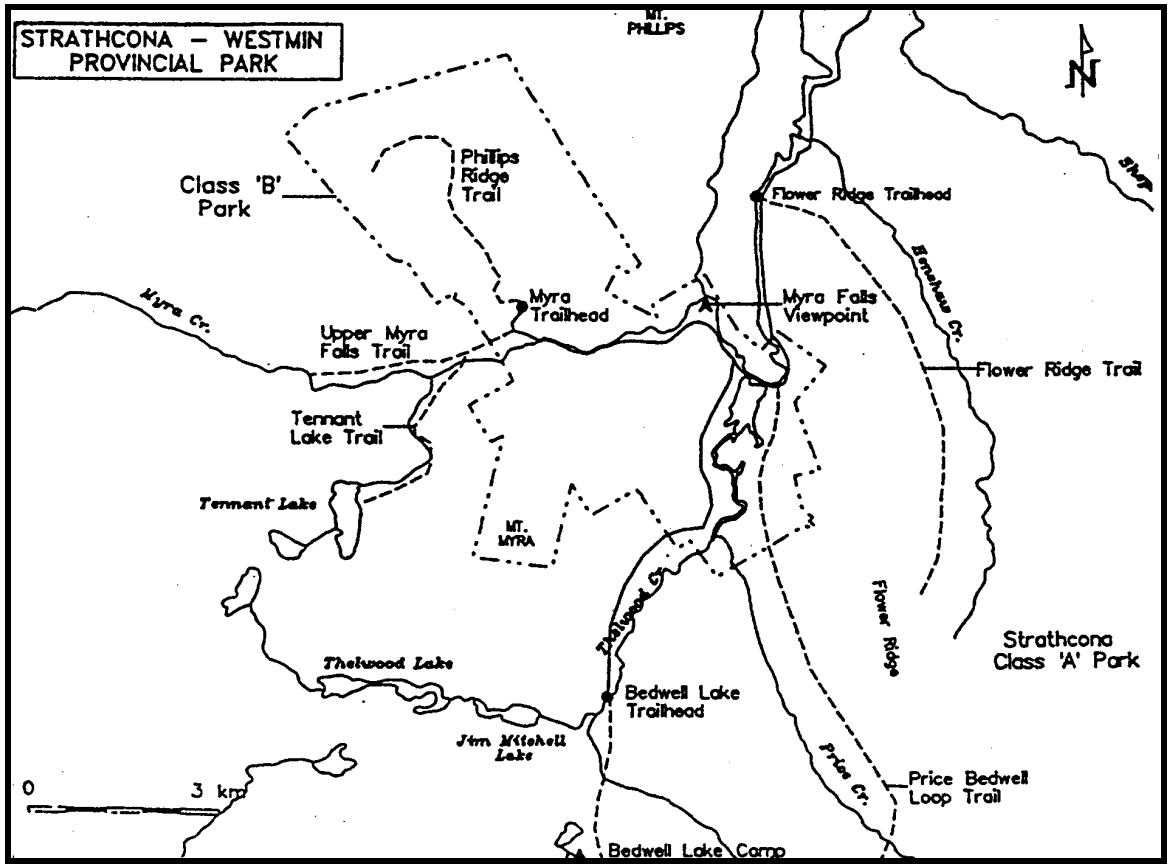
[5] DEPARTMENT OF FISHERIES AND OCEANS (DFO) - HABITAT PROTECTION

- Enforces provisions of ***Fisheries Act***

Background Summary

Strathcona-Westmin Provincial Park (Figure 3) is the latest designation for an area of land at the centre of Strathcona Provincial Park. This land is singled out for special designation because of the mineral values and the decision by the provincial government to allow exploration and mining in this area. The land was removed from Strathcona Provincial Park in 1965 and designated a Class B park. The boundaries, Park classification and Park name have changed during the intervening years. The current boundaries encompass the mining lease and claims held by Westmin Resources Ltd. (3,328 ha). The mine has been in operation since 1966 and it is expected to operate in the foreseeable future depending on commodity prices and the discovery of new reserves. The present Park Use Permit authorizing the use of park lands for mining expires on May 31, 2012.

Figure 3



An operating mine in a provincial park is an anomaly. The presence of a rich ore deposit and a long history of mineral exploration and alienation allowed by previous legislation have spawned much controversy over the years. In 1986, as one repercussion of a Supreme Court decision, government decided to allow exploration of several mineral claims within Strathcona Provincial Park. This expansion of apparent mining activity sparked public criticism, civil disobedience and the arrests of 64 protesters.

As a result of this criticism and protest, government appointed a committee, the Strathcona Provincial Park Advisory Committee, to review the decisions made for Strathcona Provincial Park. Strathcona-Westmin Provincial Park was included in the terms of reference. In June of 1988 this committee presented its findings in the report "Restoring the Balance". The recommendations of this report were accepted by government and form the basis for much of this Master Plan and the Strathcona Provincial Parks Master Plan. A key recommendation was that Westmin Resources Ltd. be permitted to stay and that it be recognized as a nonconforming user. One of the most significant results was the formation in December 1988 of the Steering Committee composed of BC Parks and public representatives to oversee the preparation of the Strathcona Provincial Park Master Plan. The Committee was also charged with supervising the preparation of the Strathcona-Westmin Master Plan.

The Park is located in the mountainous core of Strathcona Provincial Park, 90 km by road southwest of Campbell River at the south end of Buttle Lake, on the leeward side of the Vancouver Island Ranges of the Insular Mountains. This is a very rugged range forming the spine of Vancouver Island. The dominant feature is Mount Myra (1,808 m). Much of the Park is part of a bedrock formation called the Sicker Group, a heavily mineralized zone of volcanic rock extending from near Cowichan Lake north to Zeballos. This formation's mineral potential has been explored extensively and has hosted several mines, including the Myra Falls Operations of Westmin Resources Ltd..

The mouths of Myra Creek and Thelwood Creek are located in the Park. The upper portions of these watersheds are in Strathcona Provincial Park. The mine has the potential to affect water quality in both creeks and also Buttle Lake which is located on the Park's northern border.

The Park's climate is described as maritime with mild temperatures, long cloudy periods, heavy precipitation, wet mild winters, fairly dry and cool summers, and long frost free periods. Winter snow is common with a mean annual snow pack of about 80 cm.

The Park contains three of the fourteen biogeoclimatic zones (Meidinger and Pojar, 1991) identified for the province; namely, a Coastal Western Hemlock Zone, generally in the valley bottoms up to 900 m; a Mountain Hemlock Zone, from 900 m up to 1500 m; and above that, an Alpine Tundra Zone.

The Park is entirely within the Leeward Islands Mountains Ecosection, a subdivision of the Eastern Vancouver Island Ecoregion (Demarchi, 1988). Key habitats are flood plains, estuaries, subalpine meadows, avalanche tracks and spawning streams.

The mouths of Myra and Thelwood Creeks are important habitats for Trumpeter Swans and the Park's riparian zones are significant to Roosevelt Elk and beaver. Black bears, wolves and Blacktail deer also frequent the Park.

There are several recreational opportunities in Strathcona-Westmin Provincial Park, including viewing at Lower Myra Falls and fishing at the mouth of the creeks. Strathcona Provincial Park is accessed by trails originating in the Park including the Price Creek/Cream Lake, Bedwell Lake, Tennent Lake, Mount Myra, and the Phillips Ridge Trails. The Park is accessed by paved road from Campbell River.

As part of their authorization to operate, mining companies in British Columbia are required to produce both a mine plan and a reclamation plan. The mine plan mostly involves issues which are related to the health and safety of the mine workers, and describes in detail the proposed design and locations of the underground and surface operations and the facilities, ventilation systems and traffic patterns. The reclamation plan outlines conceptual decommissioning programs and documents the annual reclamation and research activities required to protect and reclaim the surface of the land and the watercourses affected by the mine.

Reclamation plans are regularly updated by the mine owners to account for enhanced reclamation standards and improved technology. The reclamation activities of Myra Falls Operations of Westmin Resources Ltd. are reviewed annually by the Vancouver Island Mine Development Review Committee (VIMDRC) which makes recommendations to the Reclamation Advisory Committee (RAC) based in Victoria. The RAC is responsible for the provincial reclamation standards. The Chief Inspector of Mines has authority to issue reclamation permits and will only issue permits based upon recommendations of the RAC.

As a mine proceeds to final closure a mine owner usually submits an amended reclamation plan which often is referred to as a decommissioning plan. This plan defines how a mine will be closed and how the site will be left following cessation of mining activity, including long term monitoring and management of pollution control systems.

The reclamation permit is the formal approval of the reclamation plan submitted by the company. Myra Falls Operations presently holds Reclamation Permit M-26; approved in February 1989 and last amended on May 27, 1991. This amended permit currently requires Westmin Resources Ltd. to post a reclamation security of $4,000,000 with the Ministry of Energy, Mines and Petroleum Resources, and submit a preliminary decommissioning plan outlining the cost of outstanding reclamation obligations. The reclamation plan and decommissioning plans are reviewed regularly, usually every five years. A draft of this preliminary plan has been received by VIMDRC. They have forwarded their comments to

RAC for its consideration in reviewing the reclamation permit. Reclamation Permit M-26 requires the Myra Falls Operations to submit a further decommissioning plan by December 31, 1995.

The reclamation security, usually called the bond, is held by the Crown to ensure that all conditions of the various permits and licences are met. Securities are required by Energy, Mines and Petroleum Resources, BC Environment and BC Parks. The security can be drawn down by

the agency holding the permit or licence at any time to pay for any costs of work not carried out by the company. In the case of Westmin's reclamation plan the present security is in the amount of $4,000,000 for the term of the permit which is five years. The present permit requires an updated plan by December 31, 1995. At that time the security will be reviewed and amended to reflect the full cost of reclamation work as detailed in the plan.

Section Three: THE ROLE OF THE PARK

Regional and Provincial Context

Strathcona-Westmin Provincial Park is an integral part of a larger park ecosystem as well as an important part of the regional and provincial economic system.

The Park does not play a major part in satisfying provincial recreation or conservation goals of BC Parks. It is, however, an important contributor to Strathcona Provincial Park's achievement of its recreation and conservation goals. Once integrated into the surrounding Strathcona Provincial Park, the industrial nature will diminish and natural values will be enhanced. The Park will act as a buffer for the wilderness areas in Strathcona Provincial Park.

Conservation Role

Approximately 26% of the Park has been modified by wildfire, mining and reservoir clearing activities. Much of the Park, about 74%, remains in a relatively natural state including Lower Myra Falls, some intact stands of valley bottom old growth and the forested slopes above the mine site. Special features of note are the riparian areas of the Thelwood valley important to Roosevelt Elk and also beaver (a species which is uncommon in the Park) and the mouth of Thelwood Creek which is used by Trumpeter Swans. Conservation of these special features will be an important management objective for the Park.

The lower portion of Thelwood Creek has spawning beds for rainbow trout, Dolly Varden, char and cutthroat trout. These spawning areas are essential to maintaining the fishery of Buttle Lake, a key recreational resource of Strathcona Provincial Park. Protection of these spawning areas will be a critical management objective for the Park.

Recreation Role

The Park has several important recreation opportunities. The recreational values are focused on Myra Creek and Falls and these natural features provide a destination and opportunities for day hiking, picnics and fishing. Tours of the mine provide an educational experience.

Vision Statement

The vision statements for Strathcona-Westmin Provincial Park look to a time when the Park will be added to Strathcona Provincial Park. The statements serve to define the nature of the Park at that time and will guide the application of short term actions to achieve the long range goal of full re-integration with Strathcona Provincial Park.

a) Conservation - When the mine is closed, the reclamation and decommissioning process will be well advanced. Through a process of progressive reclamation, the disturbed areas of the mine site will gradually be returned to as natural a state as practicable. Control

systems will be in place to ensure environmental quality standards are met. While passive systems (those requiring no regular human or machine activity) are preferred because they are not intrusive and more consistent with park objectives, the regular presence of staff will likely be required to monitor and maintain pollution control systems, where required.

The conservation value of Strathcona-Westmin Provincial Park will increase as the area is reclaimed. The area will become an important buffer to the wilderness and provide key habitat for a growing herd of Roosevelt Elk in the Thelwood Valley

b) Recreation - As the process of progressive reclamation proceeds and active mining ceases, recreation use will dominate the Park. Trailheads to the upper Myra Valley, Tennent Lake and Phillips Ridge will be well used. The road to Jim Mitchell Lake will be maintained as far as the Bedwell Lake Trailhead. Use of the trailhead established at the site of the old Thelwood powerhouse and the loop trail to Cream Lake will continue to grow. The self-guiding nature trail to the beaver ponds of the lower Thelwood Valley will become a popular day use destination. Conflict with wildlife will remain a concern. Monitoring and census of wildlife will be required to ensure recreational use does not impact wildlife. Non-invasive monitoring and census will be a part of the regular operations of the Park.

c) Myra Falls Operations of Westmin Resources Ltd. - The mineral leases located in Strathcona-Westmin Provincial Park on which Westmin is operating have been explored for the past 76 years and mined since 1966. Recent exploration successes indicate a continuation of mining operation for the foreseeable future.

The ultimate goal is to return this area to Strathcona Provincial Park, reclaimed and rehabilitated as much as practically possible, so that it will become part of the larger Strathcona Provincial Park. Westmin's role in this endeavour will be to conduct its operations, including restoration of disturbed areas, in a manner that recognizes the Park's wilderness and recreational qualities and to work with BC Parks in protecting these resources for the enjoyment of present and future generations.

Section Four: PARK ZONING

As the Park was established to allow Westmin Resource Ltd.'s Myra Falls Operations to carry out mining operations, the normal zoning system used by BC Parks has been modified to include a Non-Conforming Use Zone. Also, there are areas of the Park which require special attention, i.e., remnants of valley bottom old growth forests, riparian habitats used by elk and the side hills and alpine areas above the mine not used for mineral extraction. Correspondingly, the Park has been divided into three zones and a Non-Conforming Use Zone (Figure 4). This zoning is intended to complement the zoning for Strathcona Provincial Park

Non-Conforming Use Zone

Non-Conforming Use Zone is used to accommodate land use which is not usually acceptable in a park. This zone is usually only applied in a Class "B" Provincial Park and then only to lands which for the predictable future will continue to be used for non-park purposes.

An area of approximately 200 hectares currently used by the mine for mining activities has been designated a Non-Conforming Use Zone. This special designation is required to accommodate the mining operation and to indicate that, for a park a much higher than normal level of surface disturbance, is permitted. The size of this area may change to reflect the needs of mining.

As reclamation progresses and the mining operation no longer requires the lands, the zone may be reduced in size and the lands integrated into adjacent zones. This does not imply a change to the mining lease size. Any change to the lease will require the agreement of the mine owners.

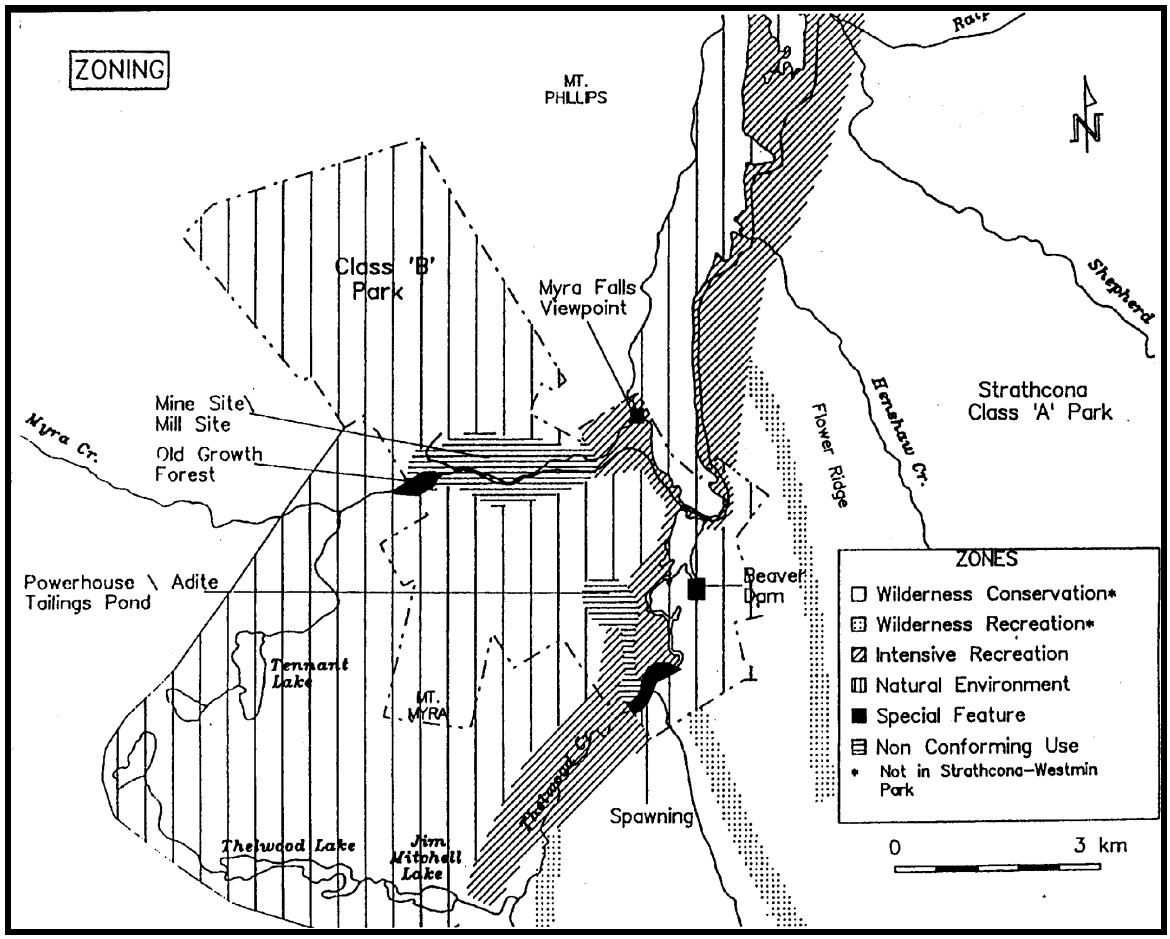
Upon final closure, the lands in this area will be designated as part of the Natural Environment Zone. However, it must be recognized that there will be a higher level of human activity than might be expected in a natural environment zone. This activity will be associated with ongoing monitoring and operation of pollution control systems.

Intensive Recreation Zone

The Intensive Recreation Zone is used to designate areas which provide a variety of readily accessible, facility-oriented outdoor recreation opportunities.

This zone is associated with nearly 300 hectares of land within the Park that have been modified through human activity including mining or fire and salvage logging. It includes areas that are being reclaimed or are recovering from being disturbed. Also included are those areas that offer access, and access-related facilities, to recreation opportunities beyond the Park.

Figure 4


ZONING
MT. PHILLIPS
Class 'B' Park
Myra Falls Viewpoint
Mine Site
Mill Site
Old Growth Forest
Myra Cr.
Powerhouse \ Adite
Tailings Pond
Tennant Lake
MT. MYRA
Thelwood Lake
Jim Mitchell Lake
Spawning
Beaver Dam
Flower Ridge
Henshaw Cr.
Strathcona Class 'A' Park
Shepherd
ZONES
Wilderness Conservation*
Wilderness Recreation*
Intensive Recreation
Natural Environment
Special Feature
Non Conforming Use
* Not in Strathcona-Westmin Park
0
3 km

Natural Environment Zone

Natural Environment Zones are used to designate lands requiring protection to ensure that scenic values and backcountry opportunities are maintained in a largely undisturbed state.

This zone designates more than 2,500 hectares of land that have not been impacted by human use, and includes areas such as Mount Myra and Phillips Ridge.

Portions of this zone, such as Phillips Ridge, may be subject to exploration of mineral potential by Westmin Resources Ltd. In some locations the type of access will be restricted. In all cases, new developments resulting in surface disturbance will be strictly controlled through Park Use Permit conditions.

Special Feature Zone

The objective of this zone is to protect and present significant natural and cultural resources, features or processes because of their special character, fragility or heritage values. This zone entails a high level of protection through ongoing monitoring of resources and control of human use. Visitor access may be restricted to preserve the zone's special qualities and to limit impacts.

This zone, about 100 hectares, includes such features as the old growth forests in Myra Creek, the area of Lower Myra Falls, the beaver dams and wetland of the lower Thelwood Valley, the spawning beds of Thelwood and Price Creeks, the valley bottom deciduous forest of the Thelwood valley and the mouth of Thelwood Creek.

Section Five: NATURAL AND CULTURAL RESOURCE MANAGEMENT

Introduction

Management of the Park's natural and cultural resources will be based on three goals:

- Minimize the short and long term effects of industrial activities on the Park and adjacent lands;
- Provide recreation opportunities; and
- Foster a co-operative atmosphere which supports the ongoing process of mineral extraction and the management and protection of the Park's conservation and recreation values.

The objectives and actions identified in this section are based on these goals. Several management principles will be applied:

1. Disturbed lands will be reclaimed (as close to the pre-disturbance state as possible) and as soon as is practicable.
2. Reclamation shall be progressive. Areas no longer required for mining, will be reclaimed in a timely manner.
3. Any surface disturbance will be minimized and will require submission of a Notice of Work and an application for a Park Use Permit that identifies resources impacted, the impacts on those resources and mitigation measures. Prior to works being initiated, Westmin Resources Ltd. must have a Park Use Permit.
4. Surface disturbance for mining exceeding that authorized by existing permits shall be referred to the Vancouver Island Mine Development Review Committee for review.
5. New permit applications or requests for changes in existing permits which involve the use of Park lands will be reviewed in a public forum. The Strathcona Provincial Park Public Advisory Committee will review these requests and provide advice to BC Parks on the public consultation process to be used.

Land

The Park Boundary

The objective of boundary definition is, in most cases, one of optimizing the size of the Park to meet the defined goals of a proposed Park. In this case, the objective is to minimize the area excluded from Strathcona Provincial Park. Closure and final reclamation of the mine will eventually negate the need for Class "B" status.

Objective:

- To return lands to Strathcona Provincial Park as soon as they are not needed for mining

purposes and reclamation has been initiated. This process may be incremental and requires the agreement of Westmin Resources Ltd.

Actions:

- Monitor progress of mining and extent of mineral reserves.
- Monitor reclamation process.
- Add reclaimed lands to Strathcona Provincial Park on an incremental basis subject to agreement with the company.

Land and Resource Tenures

Strathcona-Westmin Provincial Park was created in 1990 as a Class "B" Park by Order-in-Council 1418. Mineral rights on these lands are held by Westmin Resources Ltd. and operated by its Myra Falls Operations. The form of tenure is a combination of mineral claims, mining leases and Crown granted mineral claims. Use of park lands for mining is authorized by Park Use Permit 1363, which expires in 2012. Westmin Resources Ltd. also holds Park Use Permits 1261 and 1364, both of which expire in 2012. While primarily within Strathcona Provincial Park, they authorize water storage and power generation for the mine. All these permits (Figure 5) may be renewed upon expiry. New permit conditions could be negotiated during the renewal process.

Park Use Permit 1261 authorizes the development of hydro-electric potential of Thelwood Creek. Works included in this authorization are dams, penstocks, powerhouse, and transmission lines. Only a portion of the works (the powerhouse, nearly 800 metres of penstock, about a kilometre of road and a transmission line) are in Strathcona-Westmin Provincial Park. The remainder, including dams, penstocks and impoundments, are in Strathcona Provincial Park. The permit includes a requirement for a security bond in the amount of $100,000 to guarantee performance by the Company.

Park Use Permit 1363 permits the use of lands in the Park for mining activities and specifies the limitations on that use. The permit area coincides with the boundaries of the Park. The uses authorized by this permit have the most significant effect on the Park. The operation of the mine is also covered by a reclamation permit, M-26, issued by Ministry of Energy, Mines and Petroleum Resources. This permit incorporates a performance bond in the amount of $4,000,000. The level of this bond is related to the actual cost of restoring the site after mining ceases. Park Use Permit 1363 requires a security bond of $100,000 as well.

Park Use Permit 1364 covers development of the Tennent Creek watershed for hydroelectric power. The permit authorizes the construction of dams, roads, pipelines and transmission lines. Only a small portion, about 400 metres of road, pipeline and buried cable are in Strathcona-Westmin Provincial Park. A security bond of $100,000 is required by this permit.

While mostly outside of the Park, **Park Use Permits 1261** and **1364** are managed along with **1363** as though they were a single permit. The area directly and indirectly affected by the mine and its activities goes beyond the boundaries of the Park. The mine affects the physical

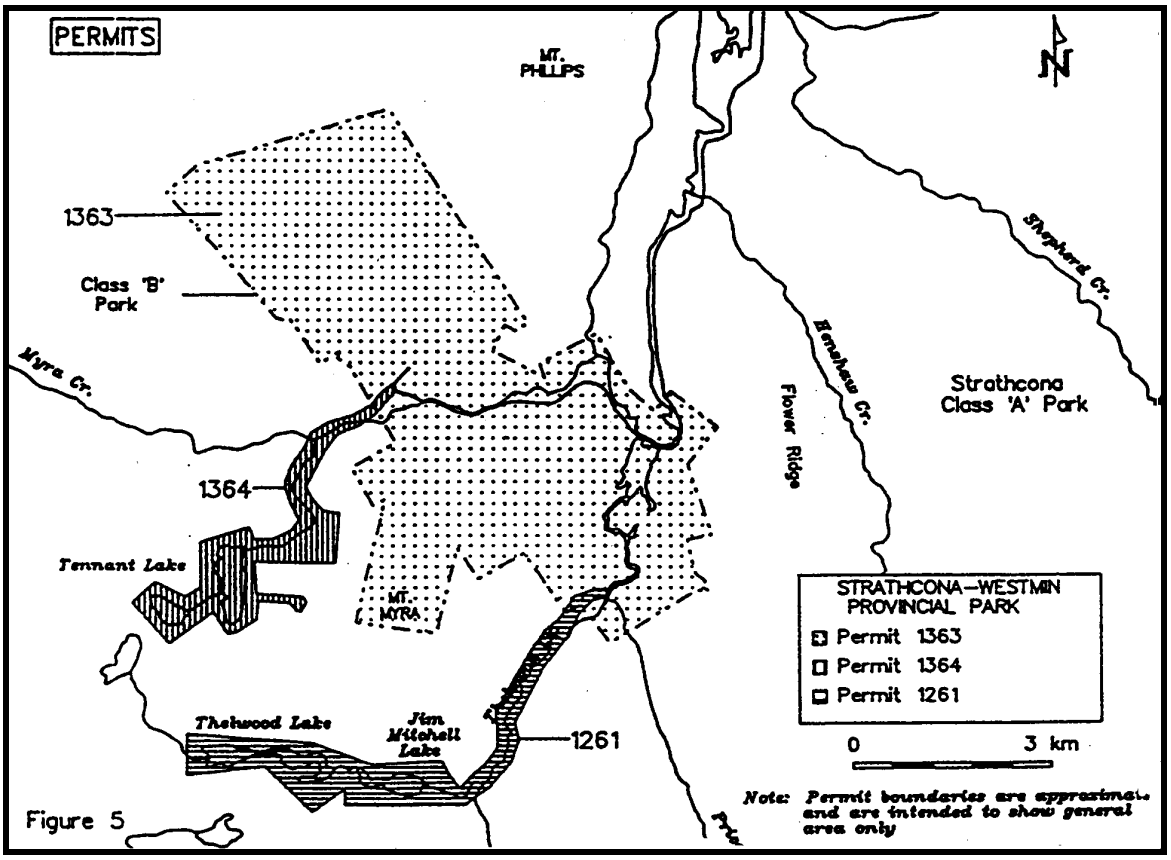
environment through impacts to air and water quality and the quality of visitors' experience through noise, increased traffic on the roads and the presence of industrial activity in a park. Management of the Park will take these impacts into consideration as decisions are being made.

Westmin Resources also holds Water Licences on both Thelwood and Tennent watersheds which allows it to store and use water for electric generation and mining purposes. These licenses apply mostly to waters outside the Park, but the impacts are associated with the mine and its activities. Consequently, management of the Park must include adjacent areas of Strathcona Provincial Park.

Strathcona-Westmin Provincial Park was designated under the ***Park Act***. Under this Act, BC Parks is responsible for management of all the lands and waters within the Park. The mine is authorized to occupy Park land by permits issued by BC Parks. The mine operation is regulated and authorized by the Ministry of Energy, Mines, and Petroleum Resources. Several other agencies of the Crown also issue permits or licences (Appendix D) to Myra Falls Operations of Westmin Resources Ltd. to authorize various activities of the mine. Each of these regulatory agencies has various requirements for reporting, inspection, or permitting for various phases of the mine operation. Figure 2 shows the agencies and their responsibilities. This multitude of authorities can lead to confusion and, in some cases, conflicting directions and instructions to Westmin Resources Ltd.

A mechanism is required to ensure that communication between government and Westmin Resources Ltd. is clear and consistent. Several agencies have authority to issue directions to Westmin Resources Ltd.. In order to foster better communication, BC Parks will organize a working group composed of field staff from agencies involved with the mine. BC Parks' Area Supervisor responsible for the Strathcona-Westmin Provincial Park will assume the role of coordinator. Other representatives will be the Mines Inspector, Environmental Protection Officer, Water Management Technician, and Fisheries Officer from Department of Fisheries and Oceans. The purpose of the group will be to discuss agency activities and ensure that the instructions given are understood and not conflict with existing direction given to Westmin Resources Ltd.

Figure 5, Park Use Permits



Objectives:

- To ensure that clear direction and instructions are provided to the company in a timely manner.

- To ensure that all plans and permits carry adequate bonding and meet current standards for environmental protection and quality.

Actions:

- Review reclamation and decommissioning plans, for the long term, to ensure that funding and measures meeting environmental quality standards are included.

- Establish a field level management coordinating group chaired by BC Parks to ensure that there is a unified Order-in-Council for government direction to Westmin Resources Ltd.

- Incorporate objectives of this plan in negotiated amendments to the existing Park Use Permits.

- Review permits and make any technical corrections required.

- Review bonding levels through VIMDRC.

Water

Waters from Myra and Thelwood Creeks flow through the Park. The ore and some of the waste rock resulting from mining are acid generating. This represents the most significant environmental risk of mine operation as uncontrolled acid rock drainage can have significant effects on downstream ecosystems.

Westmin Resources Ltd. and regulatory agencies have implemented comprehensive measures to deal with acid drainage. While these measures represent the best approaches with our current understanding, acid rock drainage will remain a concern and be the focus of continued research and technological improvement. Acid generation after closure of the mine will remain an issue and will be a dominant focus for the decommissioning plan. Monitoring of water quality is an ongoing program that will continue after the mine closes.

The Environmental Protection Branch of the Ministry of Environment, Lands, and Parks is responsible for ensuring that water quality is monitored and issuing orders to correct any problems.

Water use and storage is authorized by the Water Management Branch of the Ministry of Environment, Lands and Parks. Outside this Park, but within Strathcona Provincial Park, Westmin Resources has dammed portions of both Tennent and Thelwood watersheds. The Strathcona Provincial Park Master Plan directs that once the dams and associated structures such as penstocks, powerhouse and transmission lines are no longer needed, they be removed and the areas affected by water storage and power generation be restored to a condition representative of the area prior to their use for power generation.

There may be a need for treatment and reclamation programs after the final closure of the mine. Power will be required to maintain these programs. The removal of the dams and other power

generation structures may have to be postponed while those programs requiring power are in place.

Removal of dams and the return of water flow regimes to natural regulation may impact fish. These potential impacts need to be assessed prior to final removal of storage structures.

Objectives:

- To ensure that water quality is maintained.
- To ensure that impacts resulting from water storage and use are minimized.
- To ensure that structures and works associated with water use are removed and the areas affected restored during the decommissioning process.

Actions:

- In association with the Environmental Protection Branch of the Ministry of Environment, Lands and Parks, ensure water quality is monitored.
- Review the reclamation and decommissioning plans and include the need to remove water storage, power generation and access works when mining activity finally ceases. Include restoration of affected areas in reclamation works.
- Assess the impact of dam removal on fish stocks indigenous to the creeks prior to impoundment.

Vegetation

Vegetation patterns of the Park reflect a long history of disturbance. In 1958, the Strathcona Dam was completed and upstream areas began flooding. Much of this upstream area was logged prior to flooding. The Thelwood fire burned much of the lower Thelwood Valley and adjacent slopes; this area was salvage logged. In 1965 and 1982, portions of the Myra Valley were cleared to accommodate the mining operations.

Reclamation of disturbed areas associated with the mine is an active process. The goal of reclamation will be to establish plant communities representative of the site before mining. Reclamation will favour the use of indigenous plant material for restoration and be based on sound ecological principles.

One area of particular concern is as open pit created in the early phase of the mine. Special attention will be required to rehabilitate this area such as recontouring and revegetating.

Objectives:

- To ensure that reclamation measures are based on sound ecological principles with the goal of establishing native/indigenous plant communities on disturbed sites.
- To monitor the health and recovery of disturbed areas outside the mine operating area.
- To protect remaining undisturbed native plant communities.

Actions:

- Review reclamation plans to ensure that native plants are used to establish vegetative cover on disturbed areas such as the open pit.
- Based on existing information, facilitate an inventory of the vegetation of the Park, describe the native plant communities and use these descriptions to design and assess the adequacy of the revegetation plans.
- Use the inventory to identify remaining undisturbed areas and provide protection for these resources through detailed management planning.

Fish and Wildlife

Alpine, sub-alpine, and forested habitats seem to dominate the Park. However, the riparian and wetland habitats of the lower Thelwood Valley are of special significance. The diversity and complexity of these habitats greatly enhance the significance of the Park to fish and wildlife.

Several provincially significant species - Roosevelt Elk, Trumpeter Swans, White-tailed Ptarmigan use park habitats. Their significance is measured by being on the BC Environment Red and Blue List[3], as vulnerable to becoming endangered or threatened.

A small herd of elk has established itself in the Thelwood and Price Creek drainage. They use the alder flats in the lower portion of Thelwood Creek extensively during the winter. Roosevelt Elk are a Blue-Listed species. Trumpeter Swans, another Blue-Listed species, frequent the mouth of Thelwood Creek during the winter. Wetland and riparian areas in the lower valley are very important as spring forage areas for black bears. These same wetlands support a variety of waterfowl, song birds and a small population of beaver. The beaver is significant because of its isolation from other beaver populations in the region. The lower portions of Thelwood Creek are also important spawning areas for cutthroat and rainbow trout.

[3] The Red and Blue List is a system developed by BC Environment's Fish and Wildlife Branch to classify species at risk. The Blue List identifies species that are vulnerable and could become candidates for the Red List. The Red List is for species that are endangered or threatened.

The flood plain and riparian areas of the lower Thelwood Valley make a special contribution to habitat complexity and species diversity, giving them a significance beyond their physical size. Maintenance of this area's habitats will be a priority.

The Park is also home to another Blue-Listed species, the White-tailed Ptarmigan, which has been reported from the area around Mount Myra. The Vancouver Island wolverine and Vancouver Island marmots, both Red-Listed species, may be expected in adjacent areas of Strathcona Provincial Park and may also use parts of the Park. Wildlife surveys for these species would be required to document their presence.

Other large mammals found in the Park are black bear, cougar, wolves and deer. Black bears and the impact on them of human activity is a special concern. Low elevation valley bottoms are good spring and summer habitat for bears. The status of the population is not known but indications are that they are abundant (Blood, 1989). The potential for conflict between bears and humans is significant. Bears represent an important natural resource for the Park.

The Park is closed to hunting.

Although Buttle Lake is open to fishing, all streams entering Buttle Lake are closed. This closure was enacted to protect fish while spawning and rearing. Significant spawning and rearing areas were lost as a resulting of reservoir filling. In cooperation with the Recreational Fisheries Branch of the Ministry of Environment, Lands and Parks, regular surveys of fish in these rivers are undertaken. BC Parks also provides the Recreational Fisheries Branch angler use information by carrying out annual creel surveys on Buttle Lake.

Objectives:

- To maintain species diversity in the Park.
- To protect the habitats of key species such as elk, bears, wolves, and cougars.
- To protect fish habitat.
- To endorse practices that minimize conflicts between bears and humans.

Actions:

- Assess existing inventory information including the biophysical mapping to determine habitat values and data gaps. Develop habitat protection prescriptions for critical habitat areas.
- Conduct fish census on a regular basis.
- Monitor location and status of the elk herd.
- Initiate inventories to fill gaps in existing information.
- Prepare a bear management plan.

Cultural Resources

The Park is part of the area claimed by the Nuu-Chah-Nulth Tribal Council as its traditional territory.

Objective:

- To ensure that First Nations' rights and interests are included in planning and management of the Park.

Action:

- Establish contact with the tribal council and discuss planning and management issues.

Visual Resources

The views from the highway corridor and park roads are an important part of the visitor's experience. Continued mining activity may affect the quality of those views. Retention and enhancement wherever possible of existing visual quality will be a consideration in designing and approving works within the Park. Restoration and repair of previous modifications to the views will be given consideration. In addition, the Thelwood powerhouse produces considerable noise, and ways to reduce the levels should be investigated.

Opportunities for improving the aesthetic quality of the mine site exist. This could involve the use of vegetation to screen buildings or colour schemes which are less obtrusive.

Objective:

- To maintain or restore, if impaired, visual and auditory quality where possible.

Actions:

- Restore visual qualities of disturbed areas to a pre-modification condition through landscaping and the reclamation process.
- Through the Park Use Permit process, ensure that mine buildings and facilities are of an acceptable visual standard.
- Work with BC Hydro to restore visual quality and habitat values of flooded areas along Buttle Lake.
- Work with Westmin Resources Ltd. to reduce noise levels associated with mining activities.
- Work with Westmin Resources Ltd. to minimize the visual impact of the mine and its related facilities.

Outdoor Recreation Features

In comparison with Strathcona Provincial Park, Strathcona-Westmin's Provincial Park's recreational features are of moderate significance. These features include the falls on Myra Creek, remaining valley bottom old growth forest and riparian zones, particularly the spawning beds and beaver/wetland of Thelwood and Price Creeks. Arnica Lake is a significant backcountry destination in a sensitive subalpine environment. These features offer significant day use and overnight opportunities but are sensitive to the impacts of human activity.

Both mining operations and recreational activities could affect the quality and security of conservation features.

Objectives:

- To ensure that recreation use and mining operations consider protection of conservation features.
- To protect the Arnica Lake corridor and the area around the Lake as special conservation features.

Action:

- Manage recreation use and mining operations to minimize impacts on natural features.

Section Six: VISITOR SERVICES

General Concept

Strathcona-Westmin Provincial Park's recreational values are only of moderate significance. On its own, the Park does not offer provincially significant visitor opportunities or make a significant contribution to satisfying provincial recreation goals. Features and backcountry opportunities such as Cream Lake, Bedwell Lake, and Phillips Ridge which are key to Strathcona Provincial Park and of high provincial significance, lie just beyond the Park boundaries.

Strathcona-Westmin Provincial Park has an important function as an access point to backcountry opportunities of Strathcona Provincial Park and provides features and viewpoints in the travel corridor.

Local Recreation

Primary recreational features of Strathcona-Westmin Provincial Park are Lower Myra Falls, remnant old growth forests and the riparian zone along the lower Thelwood Creek. Facilities have been developed to present and protect some of these recreational opportunities offered by these features; other features still require development to allow realization of the feature's potential. Mining operations within the Park inhibit full development of the area's recreation potential.

Paved roads, Highway 28, and the Buttle Lake Road, provide easy access to day use opportunities. Day use activities associated with recreational features include nature appreciation, fishing, and short walks. The visual quality of the surrounding landscape is an important contributor to this experience. For local residents and visitors from Strathcona Provincial Park these features including the mine, are day-use destinations.

Access to the following backcountry destinations originates in Strathcona-Westmin Provincial Park:

- Arnica Lake, Mount Phillips, Marble Meadows, The Golden Hinde and backcountry routes to the Elk River Trail and Highway 28;
- Upper Myra Falls;
- Tennent Lake, Mount Myra and Mount Thelwood, and
- Bedwell Lake, Bedwell Valley, Cream Lake, Mount Septimus, Big Interior Mountain and Mount Tom Taylor.

Backcountry Recreation

While Strathcona-Westmin Provincial Park has few opportunities for backcountry recreation, features in adjacent areas of Strathcona Provincial Park are important. The Park's role is to ensure that access remains available to these features. While indirect, this role is very significant.

One backcountry destination, Arnica Lake, is significant for its backcountry camping potential. It is the first stop on the backcountry routes to Marble Meadows, the Golden Hinde, and the Elk River Trail, and Highway 28. Mount Myra is a backcountry destination on the south side of the Park.

Access Strategy

The mine is the southern terminus of the Buttle Lake Road. As access to the backcountry is an important function of the Park, roads leading to trailheads must be maintained to a standard suitable for passenger vehicles during the hiking season. Westmin Resources Ltd. maintains the road leading to one of the key trailheads, that of the Bedwell Lake Trail. Use by the public has not been impeded by mining operations. BC Parks will work to maintain the cooperative support of Westmin Resources Ltd. for unrestricted public access.

The use of aircraft, in particular helicopters, to access and work in the Park is a concern. To enter the Park, aircraft must cross Strathcona Provincial Park. As a consequence, aircraft entering the Park will have to abide by the strategy for air access established in the Strathcona Provincial Park Master Plan. This strategy states:

> *"An Air Access policy process will develop voluntary guidelines to control military, commercial and private overflights and their effect on the wilderness experience of those travelling on the ground. The popularity of aircraft access over and in the vicinity of the Park has affected the enjoyment of wilderness for many visitors."*

The mine has an operational need to use helicopters and is permitted to do so under its Park Use Permits. In some cases, helicopter use is encouraged to avoid road building. As the majority of the mining activities are road accessible, use of helicopters is expected to be rare. Westmin Resources Ltd. is committed to working with BC Parks to support the air access strategy for Strathcona Provincial Park.

Objective:

- To minimize the impact of aircraft on park visitors and wildlife.

Actions:

- Work with Westmin Resources Ltd. to minimize the impact of helicopter use on wildlife and recreational values.

- Encourage Westmin Resources Ltd. to time their use of helicopters to low public use periods.

- Include the Park in the comprehensive air access policy for Strathcona Provincial Park.

Information Strategy

Trailheads for the Price Creek/Cream Lake, Myra/Phillips, and Upper Myra Falls trail systems are located in the Park. BC Parks has constructed a short trail and viewing facility to Lower Myra Falls.

Objectives: (from Strathcona Provincial Park Master Plan)

- To create an awareness of the role of the Park in achieving the goals of the provincial park system.

- To promote an understanding of and appreciation for the natural and cultural resources of the Park and surrounding region.

- To instil a sense of stewardship for the Park and the Park system.

- To provide visitors with information that will enhance their use and enjoyment of the Park's facilities and services.

Actions:

- Develop a communication plan to include: interpretation and information signs at trailheads and interpretive strategies for the Lower Thelwood Valley.

- Encourage Westmin Resources Ltd. to adopt, where not prohibited by the ***Mines Act*** or Occupational Health and Safety Standards, BC Parks' sign standards for all interpretive, warning and directional signs.

- Review the concept and need for a visitor centre to interpret the geology, mining activities and natural history of the Park.

Marketing and Promotion

Strathcona-Westmin Provincial Park will be marketed as part of Strathcona Provincial Park.

Management Services

Park Operations

The operation of the Park will be fully integrated with Strathcona Provincial Park.

Public Consultation

In carrying out its stewardship responsibility, BC Parks recognizes the value of consulting the public to ensure that the public's concerns and interests regarding the management of this Park are understood and taken into consideration in the decision making process. As Strathcona-Westmin and Strathcona Provincial Parks are operated as a single unit, the existing Strathcona Provincial Park Public Advisory Committee will provide a forum for discussing issues of concern to the public and identifying suitable public consultation processes.

For purposes of discussing technical issues relating to the mine, a special annual meeting of the Strathcona Provincial Park Public Advisory Committee will be scheduled. Westmin Resources Ltd., the general public, and other resource people will be invited to this meeting to discuss the current and future mining operations.

Should a need for public input on mining issues arise sooner than the annual meeting, a special meeting of the Public Advisory Committee will be called.

Technical Consultation

To supplement and support the public consultation process, BC Parks will require technical and scientific information and advice on issues involving Westmin's mining operations. The Vancouver Island Mine Development Review Committee, chaired by the Ministry of Energy, Mines, and Petroleum Resources (EMPR's) will be used to provide advice and recommendations for technical aspects of the mine's operation. EMPR's mandate covers mining activities in the Park. BC Parks will use this committee to review any proposed changes to the current mine operations. This technical review will become part of background information used by the Public Advisory Committee in its consideration of the public interests.

Day to day routine monitoring is undertaken by BC Environment, Ministry of Energy, Mines, and Petroleum Resources; and BC Parks. These agencies are responsible for advising and providing direction to Westmin Resources Ltd. In most cases this is Ltd. to authorized, by permit or licence, and based on the conditions of permits issued by the

agencies. This plan will not change this working relationship.

Objectives:

- To ensure effective and efficient delivery of management which is in compliance with the guidelines established by this and the Master Plan for Strathcona Provincial Park.

- To ensure a high level of public involvement through an open and appropriate public advisory

group and public consultation process.

- To maintain access to technical and scientific advice and knowledge.

Actions:

- Add Strathcona-Westmin Provincial Park to the terms of reference of the Strathcona Provincial Park Advisory Committee

- Maintain the role of the Vancouver Island Mine Development Review Committee to provide scientific and technical advice.

Outdoor Recreation Opportunities

The primary recreation role of the Park is related to its function as an access route to the backcountry. Some opportunities are specific to the Park, such as day use associated with riparian habitats (especially wetland, mouths of creeks and waterfalls). These will be developed to support the objectives of Strathcona Provincial Park.

Angling

Buttle Lake is open to angling. Areas near the mouth of the Myra and Thelwood Creeks are popular for angling. All rivers and creeks entering Buttle Lake are closed to fishing by regulation.

Objectives:

- To ensure that angling does not adversely impact native fish stocks.

- To ensure that anglers have safe access to fishing opportunities.

Action:

- Monitor angling use.

Boating

Other than Buttle Lake, the waters of the Park are not conducive to boating. There is some potential for canoeing and kayaking to occur on lower Thelwood Creek; however, this may have a negative impact on wildlife.

Objective:

- To ensure that boating does not affect other Park values.

Action:

- Restrict boating on Thelwood Creek to non-motorized vessels

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Backcountry Hiking

While very few backcountry hiking opportunities exist in the Park, access to important opportunities in Strathcona Provincial Park is through the Park. These include Phillips Ridge, Cream Lake, Bedwell Lake, Tennent Lake, Mount Myra and Upper Myra Falls trails (Figure 6).

The Jim Mitchell Lake access road is a key to access to the Bedwell Lake trail system and destinations. Some sections of the road, such as the steep pitch just beyond the road to the Powerhouse, must be maintained to a high standard to ensure public access to this trailhead.

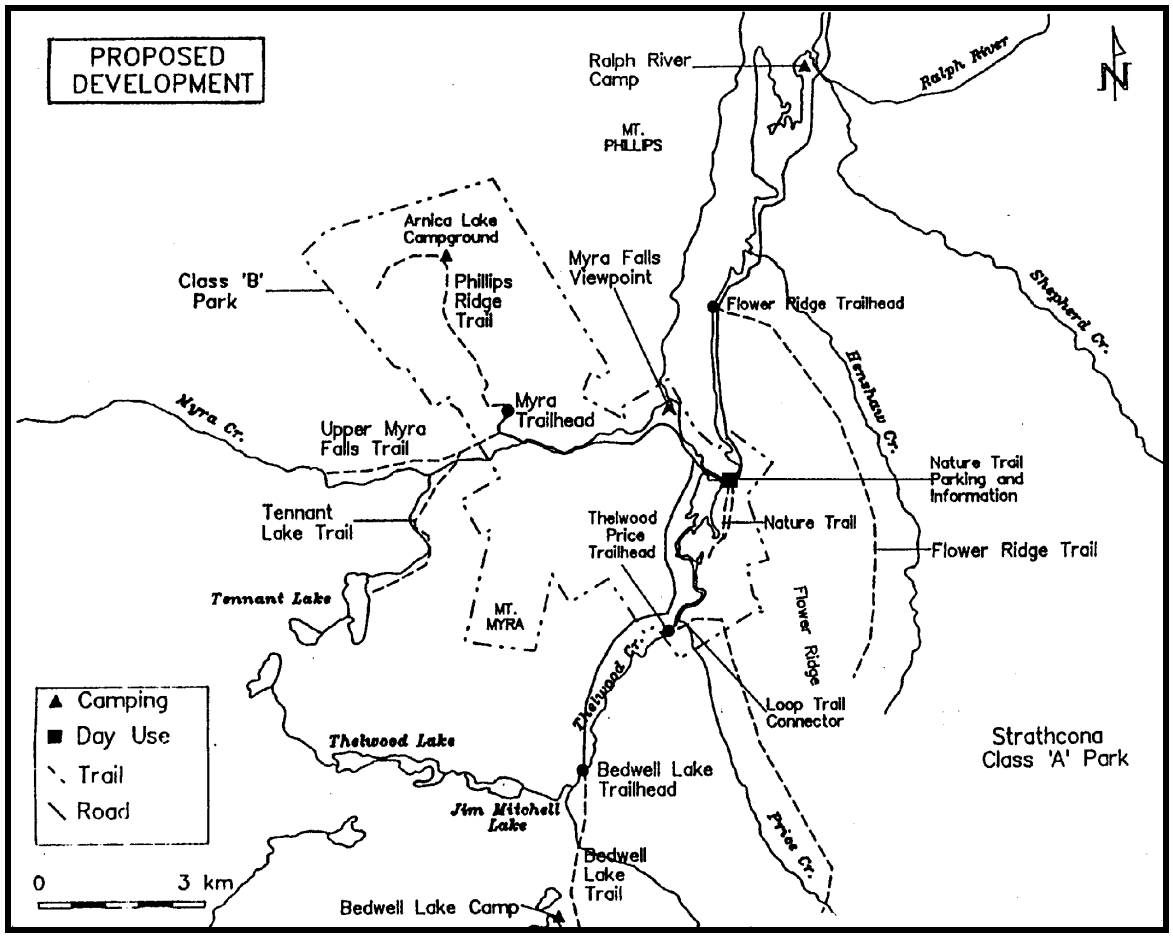
Objectives:

- To provide facilities and information at all trailheads in the Park.
- To work with Westmin Resources Ltd. to ensure access to these opportunities is not adversely impacted by mining activities.

Actions:

- Upgrade the Upper Myra Falls trailhead to Park standard including parking and information packages.
- Maintain the portion of the Jim Mitchell Lake Road in the Park to a standard suitable for passenger vehicles during the hiking season, May to October.
- Work with Westmin Resources Ltd. to ensure that recreational access to trailheads is not impeded, including access to the Bedwell Lake Trailhead.

Figure 6


PROPOSED DEVELOPMENT
Ralph River Camp
Ralph River
MT. PHILLIPS
Arnica Lake Campground
Class 'B' Park
Phillips Ridge Trail
Myra Falls Viewpoint
Flower Ridge Trailhead
Shepherd Cr.
Henshaw Cr.
Myra Cr.
Myra Trailhead
Upper Myra Falls Trail
Nature Trail Parking and Information
Tennant Lake Trail
Thelwood Price Trailhead
Nature Trail
Flower Ridge Trail
Tennant Lake
MT. MYRA
Flower Ridge
Thelwood Cr.
Loop Trail Connector
Camping
Day Use
Trail
Road
Thelwood Lake
Bedwell Lake Trailhead
Strathcona Class 'A' Park
Jim Mitchell Lake
Price Cr.
Bedwell Lake Trail
0
3 km
Bedwell Lake Camp

Upgrade trails within the Park to the same standard as their extensions in Strathcona Provincial Park.

- Develop a backcountry campsite at Arnica Lake.
- Construct the Powerhouse - Cream Lake connector trail.

Resource Appreciation

The Park has several opportunities to enhance visitor experience. The lower Thelwood Valley provides diverse habitats suitable for presentation to the visitor. Utilization of these opportunities could conflict with resource conservation objectives, especially interference with wildlife use of the area.

Objectives:

- To protect park wildlife from any negative impacts resulting from recreational activities.
- To promote appreciative uses that do not conflict with conservation of natural resources.

Actions:

- Develop interpretive programs and information about the natural features of the Park.
- Monitor human interactions with elk and bears.
- Westmin Resources Ltd. offers tours of its mining operations. BC Parks will work with the company to ensure that these tours remain available.
- Provide interpretation programs on geology and geological processes that created the conditions for mineral deposits.
- Carry out an assessment of the impact of the proposed interpretive trail in the lower Thelwood Valley as described in the Wildlife Viewing Plan for Strathcona Provincial Park; if impacts are negligible, develop the trail.
- Develop a bear management plan with Westmin Resources Ltd. to minimize impact of human activities on bears.

Sightseeing

The slopes surrounding the lower Thelwood Valley are a focal point from the Buttle Lake Parkway. Mining activities could impact this view. Lower Myra Falls represents a highly significant viewing feature from the road.

Some key view points in the Park are the Buttle Lake Parkway where it enters the Park, the bridge over the Thelwood Creek, the gravel pit on the Jim Mitchell Lake Road, and the Price Creek Trailhead. Development of these view points would provide expanded opportunities for day use and a focus for information exchange.

Objective:

- To ensure that new industrial activities give adequate consideration to aesthetics and protection of views from key viewpoints, such as Flower Ridge and Price Creek Trail to Cream Lake in the Park.

Actions:

- Work with Westmin Resources Ltd. to protect the visual qualities of the Park.
- Confirm location of key focal points and inventory visual qualities of each.
- Pursue reclamation of the Price Mine adits and access roads to improve aesthetics.

Day Use Opportunities

Day use activities by both residents of the area and tourists are significant. Fishing and viewing are the primary activities. Viewpoints and parking are required to accommodate this use.

Objectives:

- To accommodate and encourage day use and ensure that mining activities do not unduly impede these uses.
- To ensure that day use activities do not endanger the distribution and abundance of flora and fauna of the Park.

Actions:

- Provide parking and trailhead facilities in the lower Thelwood Valley adjacent to the Buttle Lake Parkway.
- After an impact assessment, develop an interpretive/wildlife viewing trail to accommodate appreciative uses in the lower Thelwood Valley.

- Upgrade existing facilities at Lower Myra Falls and Upper Myra Falls including interpretive/educational opportunities in the remaining valley bottom old growth along Myra Creek.

- Monitor human/wildlife interactions to ensure that the present species distribution and abundance is preserved.

- If feasible, and after an impact assessment, develop viewpoints along the highway as it enters the Park, near the highway bridge over Thelwood Creek, at the old gravel pit on the Jim Mitchell Lake Road and at the Price Creek Trailhead.

Section Seven: PLAN IMPLEMENTATION

Introduction

The plan specifies a series of actions needed to achieve its objectives, but not all can be implemented at once. This section provides a prioritized schedule for implementing these actions. They fall into one of three categories; ongoing management, priority one actions, and priority two actions.

Ongoing management includes those activities which are part of the normal operation of the Park. These activities have the highest priority because they are in existence now and required to maintain the quality and integrity of the Park and its resources.

Priority one actions are those considered essential to the satisfaction of Park goals. They will be implemented as soon as funds or staff can be committed.

Priority two actions are those which are important to realizing objectives but which do not need to be undertaken immediately to protect or preserve a resource.

For convenience, several actions of a similar nature have been consolidated into a single item in the implementation plan.

Ongoing Management

Mine

- Review existing Park Use Permits to ensure compatibility with the plan and negotiate any amendments required.
- Monitor progress of mining and extent of mineral reserves.
- Monitor reclamation process.
- Review reclamation and decommissioning plans to ensure that long term measures and funding are available for monitoring, maintenance, and repair.
- Review reclamation and decommissioning plans to ensure that native plants and natural processes are used to establish vegetative cover on disturbed areas.
- Ensure restoration of natural qualities of disturbed areas through the reclamation process.
- Monitor mining activities to ensure actions of the plan are implemented.
- Work with Westmin Resources Ltd. operators to protect the visual qualities of the Park.

- Work with Westmin Resources Ltd. to ensure recreational access to trailheads is not impeded.

- Recommend that Westmin Resources Ltd. continue to offer tours of its operation.

Resource Management

- Conduct fish census in cooperation with the provincial Recreational Fisheries Branch on an annual basis.

- Monitor status and location of all wildlife, including elk, in the Park.

Visitor Services

- Monitor the interaction of recreational use and wildlife and work towards eliminating or minimizing any adverse effect on wildlife.

- Monitor angling use.

- Ensure maintenance of the Jim Mitchell Road to a standard suitable for passenger vehicle passage.

Priority One Actions

Resource Management

- Ensure that directions to Westmin Resources Ltd. are clear and consistent with government policy through establishment of a field level interagency management group chaired by BC Parks. Composition of the group would be field representatives of agencies with responsibility for inspection and monitoring mining in the Park .

- Maintain the role of the Vancouver Island Mine Development Committee to advise on technical matters relating to the operation of the mine.

- Confirm the Strathcona Provincial Park Public Advisory Committee as a forum for public consultation and recommendations on further public involvement.

- Ensure water quality is monitored through discussion with agencies with jurisdiction at the coordinating committee and Vancouver Island Mine Development Review Committee.

- Establish contact with the appropriate Tribal Councils and discuss planning and management issues

Visitor Services

- Integrate facilities and signs with themes established by the Strathcona Provincial Park Master Plan.

- Upgrade Tennent Lake, Price/Cream Lake, and Myra Creek Trailheads to BC Parks standards including parking and information packages.

- Restrict boating on Thelwood Creek to non-motorized vessels.

- Investigate and minimize noise levels at Thelwood Powerhouse.

Priority Two Actions

Resource Management

- Inventory and describe the floral resources of the Park and use these descriptions to assess the adequacy of the revegetation plans with special emphasis on maintenance of rare and threatened species and communities.

- Use the inventory to help identify remaining undisturbed areas and provide protection for these resources.

- Assess existing inventory information, including the biophysical mapping to determine habitat values and data gaps. Develop habitat protection prescriptions for critical habitat areas.

- Assess the impact of dam removal on fish stocks indigenous to the creeks prior to impoundment.

Visitor Services

- Develop a communication plan including;

  (i) Interpretive and information signs at trailheads.

  (ii) Interpretive strategies for the Lower Thelwood Valley.

- Provide trails and information at access points.

- Construct Powerhouse-Cream Lake connector trail.

- Upgrade trails within the Park to the same standard as their extensions in Strathcona Provincial Park.

- Develop a backcountry campsite at Arnica Lake.

- After an impact assessment, develop a nature trail in lower Thelwood as described in the Wildlife Viewing Plan for Strathcona Provincial Park.

- Upgrade existing recreational facilities at Lower Myra Falls and Upper Myra Falls.
- Review the need and concept for a visitor centre in the Park.

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Appendix A

Summary of Background Information

PREFACE

Strathcona-Westmin Provincial Park occupies a small area at the centre of Strathcona Provincial Park. The larger park dominates discussion of the area. The features, concerns and history of Strathcona-Westmin are detailed in documents discussing Strathcona Provincial Park. The following information has been extracted from a very detailed treatment written for preparation of the Strathcona Provincial Park Master Plan. The Master Plan Background Report was prepared by Jean Hnytka in 1990 and the Natural and Human History Themes for Strathcona Provincial Park was prepared by Betty J. Brooks in 1989 and should be consulted if more detailed information is required.

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Section One: INTRODUCTION

Strathcona-Westmin Provincial Park (SWPP) is located at the mountainous core of Strathcona Provincial Park. SWPP is 63 km southwest of Campbell River and contains 3,328 ha, 1.5% of the size of Strathcona Provincial Park.

SWPP was established as a separate park unit because of the presence of an operating mine and holds a special status of Class “B” Park. This status differs from Class "A" Park status by allowing specified industrial activities to occur as non-conforming uses while minimizing the impact on other natural and recreational values of the Park.

The mine was established in the mid 60's to extract minerals staked in the early 1900's. Current reserves of ore will keep the mine operating for the foreseeable future. Commodity prices and discovery of new ore reserves will determine how long the mine operates.

SWPP contains special recreational and conservation values. Myra Falls and trail access to backcountry areas are the important recreation features while fish habitat in the lower Thelwood Valley and adjacent elk habitat are important conservation features.

The mine has created the need for special management. The primary issue is long term protection of water quality and restoration of impacted habitats as mining activities are scaled back and lands are no longer required for mining.

The approved master plan for Strathcona Provincial Park provides zoning restriction for lands adjacent to SWPP. The zoning ranges from Wilderness to Nature conservancy. This zoning recognizes the special nature of these lands and their need for protection. The mine represents a conflict with this objective and necessitates special care to ensure that all the negative impacts of mining are minimized.

Section Two: NATURAL RESOURCES

Physiography

Holland, 1964, classified the province into physiographic units. This system places SWPP into the Outer Mountain Area of the Western System of Canadian Cordillera. The Outer Mountain Area is subdivided into three smaller units; the Park is located in the Insular Mountains subdivision. This unit is further subdivided into subunits and the Park is entirely contained within the Vancouver Islands Mountains subunit.

SWPP lies along the mountainous spine of these mountains in the area of the unit called the Vancouver Island Ranges. This is an area of rugged topography created by Pleistocene uplift and dissection, the dominant feature is Mount Myra(1,808 m).

Two rock types make up the Park's geology. The dominant rock groups are volcanic principally volcanic breccia, tuff and argillite. Small areas of gabbro, peridotite, and diabase are present along the northeast boundary of the Park. The oldest rocks are volcanic flows of the Sicker Group of Palaeozoic origin.

Climate

SWPP has a maritime climate which can be typified by mild temperatures, long cloudy periods, small temperature ranges, heavy precipitation, wet mild winters, cool fairly dry summers and long frost free seasons. SWPP has a mean annual temperature of 9.2 C and mean annual precipitation of 3,080.7 mm. Because of its location in the interior of Vancouver Island, snow is common; mean annual snowfall is 80.6 cm.

Biological Resources

Vegetation

The province has been divided into fourteen (14) zones based on the ecosystem classification system for forest and range lands developed by the Ministry of Forests to describe vegetation patterns for forested lands. Five of these zones are found on Vancouver Island. SWPP has three; Alpine Tundra, Mountain Hemlock and Coastal Western Hemlock.

The vegetation patterns of the Park have been modified by human activities. Reservoir clearing, fire and, mine development have contributed to the present plant community distribution.

Alpine Tundra

This zone is a minor unit and found at high elevation, above 1500 m on the windward side of Vancouver Island. The summit of Mount Myra is the only location that this zone is found in the Park.

The extreme climate and lack of habitat diversity does not support a wide diversity of wildlife species. White tailed ptarmigan have been reported from around Mount Myra.

Mountain Hemlock

Found between 900 m and 1,500 m, the Mountain Hemlock Zone is characterised by an uneven pattern of old growth stands composed largely of mountain hemlock, Amabalis fir and yellow cedar.

Two subzones of this zone are found in SWPP; moist maritime, and at higher elevations, the moist maritime Park land. These subzones are represented by the windward variants of both. The Park land subzone is distinguished by discontinuous cover as compared to the continuously forested cover of the lower elevation subzones.

Heavy snow cover and cool moist winters limit the range of species which use this zone. Most species are not full time residents. Vancouver Island Marmot is found in this zone's Park land or herb meadow habitats; however, none are found in the Park.

Coastal Western Hemlock

This zone is found in valley bottoms and up to 900 m. Two subzones of this zone are found in SWPP; the moist maritime submontane variant and the moist maritime montane variant.

This zone contains one of the most diverse arrays of habitats of any in British Columbia. Species diversity is very high. Important species in Strathcona-Westmin Provincial Park are Black-tailed Deer, Black Bear, wolf, Roosevelt Elk, and beaver.

Water

SWPP includes the lower portion of two major drainage, Myra, Price, and Thelwood Creeks, as well as portions of Buttle Lake.

Both of these drainages have been used for hydro-electric power generation and water supply by Westmin Resources Ltd. The reservoirs for power generation are outside SWPP. Myra Creek is used as a water supply for the mine.

Water quality is a concern as the ore mined in the Park is acid generating and represents a risk to the water quality of the lake and its biological environment. As well milling of the ore on site could present a problem to water quality.

Westmin has taken measures to assure water quality. The systems used to ensure that the water entering the Buttle Lake is uncontaminated require maintenance and monitoring to insure they are functioning properly.

Buttle Lake is located in the watershed that supplies water to the community of Campbell River. Campbell River is a primary salmon producing system. The water quality is therefore very important and sensitive issue. Any use in the watershed which could affect water quality is of major concern.

Wildlife

Undisturbed habitats within SWPP are Ltd.. The most significant habitats were the old growth valley bottom. These have been disturbed by fire, flooding, logging, and mining. Very little of them remains.

Of the remaining habitats, the most important and sensitive are the riparian and estuary areas of the lower Thelwood Valley. These habitats are important to elk, Trumpeter Swans, bears, wolves and beaver.

Large carnivores, especially black bears, are a special concern as they represent a potential threat to humans. The lower elevations of Strathcona-Westmin Provincial Park contain significant habitat suitable for bears. Blood (1987) indicates that bears are abundant in the Park. In the past, garbage has been a problem at the mine site. This issue has been dealt with; however, bears still often come into conflict with humans at the mine. Management planning is required to ensure that bear populations are not put at risk due to human related problems. Recreational activities in the Park will have to be monitored to ensure that conflicts are minimized.

The Wildlife Branch uses a broad classification system, Ecoregions, to describe habitats for the province. SWPP falls into the Leeward Island Mountains Ecosection of the Eastern Vancouver Island Ecoregion. Important habitat within this ecosection are flood plains, estuaries, subalpine meadows, southerly aspects, including old growth and young seral stages, avalanche tracks, salmon streams, and seepage sites

Rare and Endangered Species

The province has established a list of species at risk. The list is divided into three categories based on risk. The Red List contains species which are candidates for endangered or threatened status. The Blue List contains species which are sensitive or vulnerable. The third list, Yellow, contains species of management concern.

SWPP does not have a large enough area to contain a complete habitat for any one species. However, several species that are Red-Listed use portions of the Park at least part of the year. These include Trumpeter Swans and Vancouver Island Wolverine.

Blue-Listed species include: Bald Eagle, Marbled Murrelet, Roosevelt Elk, Western Wolverine.

Mammals

Deer, elk, and bears are the most visible species in the Park. However marten, mink, wolf, cougar and beaver have been seen in the area of the Park. A key issue will be to ensure that bear/human conflicts are minimized.

Roosevelt Elk

This is a species of special interest. Historically, elk were present in the valley until the early 1970's. After that time they were not present. Recently, a small population has returned to the Thelwood Valley. They appear to be a non-migratory population and expanding in size. The concern will be to ensure that this population is not disturbed by recreation and industrial activities.

Birds

No specific surveys of the birds in SWPP have been undertaken. Approximately 157 species have been recorded in Strathcona Provincial Park; not all will be present in SWPP. The Friends of Strathcona Provincial Park have for several years conducted spring bird counts in the Park.

Trumpeter Swans

Swans are frequently seen foraging in the estuaries of the Thelwood and Myra Creeks during the winter.

Bald Eagles

Eagles are winter visitors.

White-Tailed Ptarmigan

The White-Tailed Ptarmigan has been reported from the Mount Myra area.

Amphibians and Reptiles

No specific surveys for amphibians and reptiles have been undertaken in SWPP but several species of amphibians, three species of garter snake, and one lizard are reported or expected to occur in Strathcona Provincial Park.

Fish

Three species of salmonoid utilize SWPP; rainbow, cutthroat, and Dolly Varden trout. Thelwood Creek is an important spawning area for cutthroat and rainbow trout. There is a

resident population of trout above Myra Falls.

Sculpins and stickleback are present in SWPP's waters but no detailed inventories of these species have been undertaken.

The primary concern will be to maintain water and habitat quality so these species are not threatened by development.

Section Three: CULTURAL RESOURCES

Native Peoples and History

Aboriginal use is not documented for SWPP. It is probable that First Nations Peoples visited the area.

Park History

The history of Strathcona as well as SWPP is well documented in Baikie(1986). Following is a summary of key dates:

1865 James Buttle's exploration and discovery of Buttle Lake
1894 Exploration of Buttle Lake by Reverend W. W. Bolton.
1909 Exploration of Buttle Lake and Thelwood Drainage by Price Ellison; travelled down Lake and up Price Creek and over a pass to Alberni
1911 Creation of Strathcona Provincial Park
1913 First addition to the Park
1918 ***Strathcona Provincial Park Act*** amended to allow staking of mineral claims
1927 Act amended to allow authority to grant water licenses
1951 Permission granted to flood Buttle Lake
1957 Water level of Buttle Lake begins to rise
1959 Western Mines (later to become Westmin Resources Ltd.) establishes mine in the Park
1964 Road along Lake developed to access mine site
1966 Mine operation commences
1967 Mine tailings disposed in Buttle Lake
1973 Prospecting and exploration of mineral claims prohibited in provincial parks
1980 Discovery of the HW ore body and proposed expansion of mine operations
1987 Strathcona Recreation Area created to encompass all mineral tenures in Strathcona Provincial Park
1989 Recreation Area cancelled and Class "B" park created over just the Westmin Claim area. Called Strathcona-Myra Park
1990 Strathcona-Myra name changed to Strathcona-Westmin

Section Four: RECREATIONAL AND VISUAL RESOURCES

Outdoor Recreation Feature Inventory

The outdoor recreation features of SWPP have been mapped (Ministry of Lands, Parks, and Housing, 1984). Several features of high significance were noted in SWPP: the mountains surrounding Buttle lake particularly Mount Myra, Myra Falls, and the lower Thelwood Valley.

Visual Resources

The visual resources have been mapped (Ministry of Lands, Parks, and Housing, 1983). The shoreline and surrounding slopes of Buttle Lake are noted as having a very high scenic distinction rating. Myra Valley has a moderate rating and Thelwood Valley has a very high rating (it is part of the Buttle Lake unit).

Section Five: LAND TENURE, OCCUPANCY RIGHTS, AND PARK BOUNDARIES

Park Boundaries and Government Jurisdictions

SWPP is a Class "B" Park under the ***Park Act***. This designation allows other than conservation and recreation activities where they are not detrimental to the recreational values of the park concerned.

The present boundaries are the result of a long series of boundary changes. The current boundary is coincidental with the extent of Westmin Resources Ltd. mineral rights. These changes are a reflection of changing societal values and the emphasis they place on preservation of natural areas.

Jurisdiction

BC Parks is responsible for all matters including fish and wildlife species under provincial control, management of facilities, signage, refuse, fire control in the Park.

This responsibility is subject to the application of the ***Heritage Conservation Act***, ***Environment and Land Use Act***, ***Waste Management Act*** and Section 17 of the ***Mineral Tenure Act.***

Federal statues and regulations apply in the Park.

Park Use Permits

Park Use Permits are required for all commercial activities in the Park. Following is a list of valid Park Use Permits in SWPP.

Permit	Holder	Purpose
1261	Westmin Resources	Thelwood and Jim Mitchell Lake Dams, penstocks, powerhouse and transmission line
1363	Westmin Resources	Mine site
1364	Westmin Resources	Hydro-electric power generation, transmission line, and roads

Land Tenures

The only encumbrances on lands in the Park are either mineral claims or mining leases.

Private Inholding

No fee simple holdings, surface rights exist within SWPP.

Section Six: RESOURCE USE AND ACTIVITIES

Introduction

Both Strathcona and Strathcona-Westmin Provincial Parks have a history of resource use and extraction. These uses either flow from rights granted prior to establishment of the Park or prevailing attitudes at the time of granting rights. Current philosophy is more restrictive.

Mineral Tenures and Mining Activity

History of Park Establishment and Mineral Claims Policy

The Strathcona Provincial Park area has attracted mineral exploration since the turn of the century, the earliest claims still existing were staked prior to Strathcona Provincial Park being established in 1911. The current pattern of claims and leases can be traced through changing government policy as follows:

pre 1911	Claims staked
1911-1918	New staking and exploration not permitted
1918	***Strathcona Provincial Park Act*** amended to recognize existing claims and to allow further staking. Surface rights were not granted and use of timber was restricted
1939	Class "A" and "B" parks open to logging and mining under the ***Forest Act***
1949	Staking allowed in Class "A" Parks by Order-in-Council 2055
1957	***Strathcona Provincial Park Act*** repealed. Strathcona Provincial Park established as a Class "A" Park. Prospecting, locating, and mining were allowed subject to conditions
1959	Western Mines allowed to establish in the Park
1964	Order-in-Council 659 prevents staking in parks of Class "A" or "B" if less than 5,000 acres
1965	Lands around the southern end of Buttle Lake reclassified to Class "B" Parks. Permits granted to Western Mines to mine at Myra Creek
1967	Cream Silver granted permit to explore claims adjacent to Western Mines

(Westmin Resources Ltd.) in the Park. Western Mines begins discharging tailings into Buttle Lake

1973 Order-in-Council 1442 excludes prospecting and mining from all parks. Existing claims require a Park Use Permit to continue exploration

1980 Major expansion of Westmin Mines begun to extract ore from the HW mineral deposits

1985 Westmin granted Park Use Permit for damming Jim Mitchell Lake for power

1988 New provincial policy on mineral exploration and mining announced. No new mineral exploration in provincial parks, except Westmin site. No new tenures will be issued and no new logging allowed

Present Mineral Tenure Status

All of SWPP is covered by some form of mineral tenure. The tenures are a combination of Crown granted claims, mining leases, and mineral claims. All are held by Westmin Resources Ltd.

Mining Activity

SWPP is known to contain a highly favourable environment for copper, lead, zinc, gold and silver. The operating mine is proof of this significance. Current mine operations have a capacity of approximately 3000 tonnes per day.

Current reserves are adequate to continue mining for the next ten to twenty years. The company continues to explore within its claim and lease area and given favourable geology and market conditions, it is expected that this estimate is conservative.

Forest Resources and Forest Activity

There are no forest tenures within SWPP.

Permitted/Licence Uses

Hunting

SWPP is closed to hunting.

Fishing

All rivers and streams entering Buttle Lake are closed to angling. The lake itself is open to angling.

Trapping

No trapping is permitted in SWPP.

Access

SWPP is accessed by a paved highway from Campbell River. A system of roads within the mine site provides access to trailheads within SWPP. An access road along Thelwood Creek provides access to features beyond the Park.

Accommodation and Campgrounds

No designated public accommodation exists in SWPP.

Day Use Facilities

Recreation features are Ltd.. Most facilities are oriented to providing access to features beyond the Park used in Strathcona Provincial Park. Myra falls represents the most significant feature currently by the public.

The mine is a day use feature and offers guided tours.

Section Eight: MARKET AND USE ANALYSIS

Existing Use, User Characteristics, and Attitudes

The Park contains day use opportunities for visitors. The features which attract use are Myra Falls, the Lower Thelwood Valley with its riparian and estuary areas and the remaining old growth stands. Trailheads to several backcountry destinations in Strathcona Provincial Park originate from the Park. The mine offers tours of the operation and these provide day use opportunities to park visitors. While not a dependable attraction, viewing of bear, elk, and swans enhances the visitors' experience.

Appendix B

BC Parks Zoning

	Intensive Recreation	Natural Environment
OBJECTIVE	To provide for a variety of readily accessible, facility-oriented outdoor recreation opportunities.	To protect scenic values and to provide for backcountry recreation opportunities in a largely undisturbed natural environment.
USE LEVEL	Relatively high density and long duration types of use.	Relatively low use but higher levels in association with nodes of activity or access.
Means of Access	All-weather public roads or other types of access where use levels are high (see "Impacts" below).	Mechanized (powerboats, snowmobiles, off-road all terrain vehicles), non-mechanized (foot, horse, canoe, bicycle). Aircraft and motorboat access to drop-off and pickup points will be permitted.
LOCATION	Contiguous with all-weather roads and covering immediate areas, modified landscapes or other high-use areas.	Removed from all-weather roads but easily accessible on a day-use basis. Accessible by mechanized means such as boat or plane.
SIZE OF ZONE	Small; usually less than 2,000 ha.	Can range from small to large.
BOUNDARY DEFINITION	Includes areas of high facility development in concentrated areas.	Boundaries should consider limits of activity/facility areas relative to ecosystem characteristics and features.
RECREATION OPPORTUNITIES	Vehicle camping, picnicking, beach activities, power-boating, canoeing, kayaking, strolling, historic and nature appreciation, fishing, snowplay, downhill and cross-country skiing, snowshoeing, specialised activities.	Walk-in/boat-in camping, power-boating, hunting, canoeing, kayaking, backpacking, historic and nature appreciation, fishing, cross-country skiing, snowmobiling, river rafting, horseback riding, heli-skiing, heli-hiking, and specialised activities.

Special Feature	Wilderness Recreation	Wilderness Conservation
To protect and present significant natural or cultural resources, features or processes because of their special character, fragility and heritage values.	To protect a remote, undisturbed natural landscape and to provide backcountry recreation opportunities dependent on a pristine environment where air access may be permitted to designated sites.	To protect a remote, undisturbed natural landscape and to provide unassisted backcountry recreation opportunities dependent on a pristine environment where no motorized activities will be allowed.
Generally low.	Very low use, to provide solitary experiences and a wilderness atmosphere. Use may be controlled to protect the environment.	Very low use, to provide solitary experiences and a wilderness atmosphere. Use may be controlled to protect the environment.
Various; may require special access permit.	Non-mechanized; except may permit low frequency air access to designated sites; foot, canoe (horses may be permitted).	Non-mechanized (no air access); foot, canoe (horses may be permitted).
Determined by location of special resources; may be surrounded by or associated with any of the other zones.	Remote; not easily visited on a day-use basis.	Remote; not easily visited on a day-use basis.
Small; usually less than 2000 hectares.	Large; greater than 5,000 hectares.	Large; greater than 5,000 hectares.
Area required by biophysical characteristics or the nature and extent of cultural resources (adequate to afford protection).	Defined by ecosystem limits and geographic features. Boundaries will encompass areas of visitor interest for specific activities supported by air access. Will be designated under the *Park Act.*	Defined by ecosystem limits and geographical features. Will be designated under the *Park Act.*
Sightseeing, historic and nature appreciation. May be subject to temporary closures or permanently restricted access.	Backpacking, canoeing, kayaking, river rafting, nature and historic appreciation, hunting, fishing, cross-country skiing, snowshoeing, horseback riding, specialised activities (e.g. caving, climbing).	Backpacking, canoeing, kayaking, river rafting, nature and historic appreciation, fishing, cross-country skiing, snowshoeing, horseback riding, specialised activities (e.g. caving, climbing).

	Intensive Recreation	Natural Environment
FACILITIES	May be intensely developed for user convenience. Campgrounds, landscaped picnic/play areas, trails, accommodation or interpretative buildings; boat launches, administrative buildings, service campgrounds, gravel pits, disposal sites, wood lots; parking lots, etc.	Moderate development for user convenience. Trails, walk-in/boat-in campsites, shelters, accommodation buildings may be permitted; facilities for motorized access e.g. docks, landing strips, fuel storage, etc.
IMPACTS ON NATURAL ENVIRONMENT	Includes natural resource features and phenomena in a primarily natural state but where human presence may be readily visible both through the existence of recreation facilities and of people using the zone. Includes areas of high facility development with significant impact on concentrated areas.	Area where human presence on the land is not normally visible, facility development limited to relatively small areas. Facilities are visually compatible with natural setting.
MANAGEMENT GUIDELINES	Oriented toward maintaining a high quality recreation experience. Intensive management of resources and/or control of visitor activities. Operational facilities designed for efficient operation while remaining unobtrusive to the park visitor.	Oriented to maintaining a natural environment and providing a high quality recreation experience. Visitor access may be controlled to preserve the recreation experience or to limit impacts. Separation of less compatible recreational activities and transportation modes. Designation of transportation may be necessary to avoid potential conflicts (e.g. horse trails, cycle paths, hiking trails).
EXAMPLES OF ZONING	Campground in Rathtrevor Beach Park; Gibson Pass ski area in E.C. Manning Park.	Core area in Cathedral Provincial Park; North beach in Naikoon Park.

Special Feature	Wilderness Recreation	Wilderness Conservation
Interpretative facilities only, resources are to be protected.	Minimal facility development. Limited development for user convenience and safety, and protection of the environment e.g. trails, primitive campsites, etc. Some basic facilities at access nodes, e.g. dock, primitive shelter, etc.	None.
None; resources to be maintained unimpaired.	Natural area generally free of evidence of modern human beings. Evidence of human presence is confined to specific facility sites. Facilities are visually compatible with natural setting.	Natural area generally free of evidence of modern human beings.
High level of management protection with ongoing monitoring. Oriented to maintaining resources and, where appropriate, a high quality recreational and interpretative experience. Active or passive management depending on size, location, and nature of the resource. Visitor access may be restricted to preserve recreation experience and to limit impacts.	Oriented to protecting a pristine environment. Management actions are minimal and not evident. Managed to ensure low visitor use levels. Visitor access may be restricted to protect the natural environment and visitor experience.	Oriented to protecting a pristine environment. Management actions are minimal and not evident. Managed to ensure low visitor use levels. Visitor access may be restricted to protect the natural environment and visitor experience.
Tidepools in Botanical Beach Park; Sunshine Meadows in Mount Assiniboine Park.	Quanchus Mountains Wilderness in Tweedsmuir Park; Wilderness Zone in Spatsizi Park.	Central Valhallas Wilderness in Valhalla ProvincialPark; Garibaldi Park Nature Conservancy area.

Appendix C

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Appendix D

Summary/Analysis of Public Comments On the Strathcona-Westmin Provincial Park Draft Master Plan

To ensure that the development of the master plan for Strathcona-Westmin Provincial Park identified and addressed the needs of the general public, a public involvement process was included as part of the overall planning process. This process is an extension of the earlier public review of the master plan for Strathcona Provincial Park. In that process, almost 600 people attended ten public meetings and some 900 written responses were received. This report is a summary of the comments on the key issues of the draft plan for Strathcona-Westmin Provincial Park and includes comments on the management on Strathcona-Westmin Provincial Park that were made during the Strathcona Provincial Park planning process.

The Public Involvement Process

The public involvement process consisted of an open house of displays explaining the main elements of the draft plan immediately followed by a meeting chaired by several members of the Strathcona Park Advisory Committee. The meetings took place in Black Creek and Duncan in February, 1995. The meetings consisted of a brief slide presentation and explanation of the role of the steering committee. The draft plan was presented followed by a question and answer period.

At the Black Creek meeting, seven people attended despite a severe snow storm. The following day in Duncan, six people attended. At each meeting, members of the public had the opportunity to discuss their concerns individually as well as in the public forum. Written submissions were encouraged and 15 were received.

As with the Strathcona Provincial Park Master Plan, certain issues dominate the planning process. After review of the public comments for Strathcona-Westmin Provincial Park, the following issues were identified; bonding, name of the park, reclamation/decommissioning, BC Parks''presence, and surface disturbance. There were other issues and suggested changes mentioned; however, these main issues were repeatedly identified in the submissions and during the meetings.

ISSUE - USE OF "WESTMIN" AND "PARK" IN PARK NAME

Park Comment

The use of the term "park" and the company name "Westmin" was not appropriate. The area is dedicated to mining and should be named accordingly. Some preferred the old

name Strathcona-Myra Falls Provincial Park to reflect the Myra Falls Operation name of Westmin, while others suggested the area be called Strathcona-Westmin Temporary Non-

conforming Use Area. It was suggested that the ***Park Act*** be revised to define the mine operation as a Non-Conforming Industrial Zone to eliminate a mine site being designated park land.

Analysis

With such a unique entity as Strathcona-Westmin Provincial Park, it would be difficult to come up with an appropriate name that would have wide appeal.

The two issues with the name are: the use of the designation "Park" and the company name "Westmin". As Strathcona-Westmin Provincial Park is a Class "B" Provincial Park designated under the ***Park Act***, the use of the title park must be used. The name "Westmin" was used to reflect the non-conforming use of the Park. The name is synonymous with mining, whereas the name Myra is also used in reference to the falls and creek and not necessarily the mine.

Plan Recommendation

No change to the name of the park or its designation as a park is recommended.

ISSUE – BONDING

Public Comments

In keeping with the comments made during the Strathcona Provincial Park public review, there were a number of comments on the bonding requirements for the mine. Most people felt that it was too low and should be raised given the long term it would take for environmental clean up. Most of the questions were answered during the meetings. It was suggested that a levy on tonnage of concentrate be used to fund reclamation.

Analysis

Adequate bonding is critical to ensuring the land is restored to a natural state. As restoration could take a long period of time, the bond must be secure from any eventuality.

Plan Recommendation

The plan recommends that the amount of the bond be reviewed and renegotiated to reflect the anticipated full cost of long term reclamation.

ISSUE – RECLAMATION/DECOMMISSIONING

Public Comment

There were many requests that the open pit mine and unused adits be reclaimed. It was stressed

that only native species be used in revegetation of any disturbed areas.

A time table schedule for decommissioning was suggested, including a fixed time frame of no more than 24 months. The plan needs to specify who oversees monitoring and review of reclamation and what public involvement there may be in the review of Westmin's management and the reclamation plan.

Analysis

A number of these comments have already been addressed in the plan and answered during the meeting. The other comments are items specific to the Reclamation Permit M-26.

Plan Recommendation

Encourage Westmin to prepare a detailed recovery plan for the open pit.

Review reclamation implementation to ensure that native plants are used to establish vegetation cover on disturbed areas.

The Strathcona Park Public Advisory Committee will be continued in its advisory capacity to bring forward public concerns.

ISSUE – BC PARKS' PRESENCE

Public Comments

Several felt that BC Parks should be more assertive stewards of the remaining park values by taking precedence over other Ministries.

Analysis

With multiple jurisdictions, it is most effective to take a cooperative and coordinated appropach to management. When you have all parties working together to achieve their respective goals, the results are long lasting.

Plan Recommendation

Establish a field level management coordinating group chaired by BC Parks to ensure that there is a unified voice for government direction to Westmin Resources Ltd.

ISSUE – SURFACE DISTURBANCE

Public Comments

There was concern that surface disturbance should not be allowed to expand beyond current commitments or beyond the park boundaries so that the area remains in as natural state as possible.

Analysis

Currently, the company has agreed to restrict disturbance of the surface in the Phillips Ridge area of the Park except for possible ventilation portals. Any surface disturbance is restricted to the operational needs of the company and by the values of the Park. Generally, surface disturbance should be absolutely minimized and not detrimental to the recreation values of the Park.

Plan Recommendation

Surface disturbance for mining exceeding that authorized by existing permits shall be referred to the Vancouver Island Mine Development Review Committee for review.

New permit applications or requests for changes in existing permits which involve the use of Park lands will be reviewed in a public forum. The Strathcona Park Public Advisory Committee will review these requests and provide advice on the most appropriate form of public consultation process to be used.

Appendix E

CONTENTS OF RECLAMATION PERMITS AND PLANS

Two documents govern Westmin Resources Ltd.'s reclamation activities; both are reviewed and approved by the Ministry of Energy, Mines, and Petroleum Resources (EMPR). The primary document is Reclamation Permit M-26 which outlines the principles and goals for reclamation. The second document is the reclamation plan, sometimes called the decommissioning plan which outlines a more specific program of reclamation and defines how the principles and goals will be achieved.

Following are general summaries of these documents.

A. Reclamation Permit M-26

This summary is based on the latest, 27 May 1991, version of the permit. The permit is reviewed and renewed at five year intervals. The permit consists of two sections and 19 special conditions. This summary is general and should not be used to judge compliance. The intent ifs to provide a sense of the permit and the reader is urged to read the permit.

Preamble

This permit defines reclamation requirements of the Ministry of Energy, Mines and Petroleum Resources and the relationship to other agencies. Wherever possible it is compatible with requirements of other agencies. The authority of other agencies is not Ltd. by this permit.

Decisions will be made in consultation with other Ministries.

Amendments

Reclamation is subject to these conditions:

1. Reclamation Security

Additional security will be required. The amount will be determined by the Minister based on discussions between the Permittee and EMPR staff.

2. Annual Reclamation Report

By March 31 of each year a report including an estimate of the cost of outstanding

reclamation obligations including closure of the mine and long term costs of treatment of acid mine drainage. An updated five year plan is part of the report.

3. Land Use

   The surface of the land shall be reclaimed to the following use:
   (a) reintegration of disturbed lands into the surrounding landscape and park,

   (b) re-establishment of native forest,

   (c) reduction of erosion through development of maintenance-free indigenous vegetation covers, and the development of self-sustaining, erosion-free water courses.

4. Productivity

   Productivity shall not be less than existed prior to mining.

5. Long-term Stability

   Land and watercourses shall be left in a stable condition.

6. Revegetation

   Native indigenous species shall be used and cover established to a self sustaining state. Inventory and assessment programs shall be included in the annual report.

7. Use of Suitable Growth Media

   Growth medium shall satisfy land use, productivity and water quality objectives.

8. Treatment of Structures and Equipment

   All to be removed or covered.

9. Waste Dumps

   Waste dumps shall be reclaimed. Monitoring of measures are required.

10. Watercourses

Water courses to be reclaimed to ensure water quality and drainage is returned to original or new water courses that maintain themselves. Acid generation to be minimized at source.

11. Pits

    Pit walls in over burden to be reclaimed. Pit walls greater than 2:1 slope do not have to be reclaimed. Where free of water vegetation will be established. Where water impounded a body of water that meets productivity objectives to be established.

12. Roads

    All roads except those required for permanent access shall be reclaimed.

13. Metal Uptake in Vegetation

    Vegetation shall be monitored for heavy metal uptake.

14. Disposal of Fuels and Toxic Chemicals

    All regulations shall be complied with

15. Acid Generation Material

    Methods to reduce or eliminate acid rock drainage will be evaluated. Amount of acid generated shall be monitored. Treatment will continue until effluent meets Ministry of Environment, Lands and Parks standards.

16. Monitoring

    Permittee shall undertake monitoring to ensure all objectives are being met.

17. Temporary Shutdown

    If shutdown longer than one year Permittee shall carry out conditions of permit or request an amendment .

18. Safety Provisions

    All safety provisions to be complied with.

19. Closure Plan

    A closure plan shall be submitted. A complete and updated plan is required by December 31, 1995. The permit may be amended.

B. Reclamation Plan

The following executive summary outlines the reclamation or decommissioning plan.

DRAFT

WESTMIN RESOURCES LIMITED

MYRA FALLS OPERATIONS

DECOMMISSIONING PLAN

EXECUTIVE SUMMARY

JANUARY 1992

DRAFT

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DRAFT

1.0 INTRODUCTION

A decommissioning program has been developed for Westmin Resources Limited, Myra Falls Operations which is based on the current knowledge of acid generation control and land use objectives. It should be recognized that the decommissioning plan is a dynamic one and will be revised and re-submitted every five years. The mine is believed to have a life of at least 10 to 20 years and it is expected that changes in control technologies will occur which may modify activities outlined in this plan. For example, the potential for controlled leaching of waste rock and recovery of leached metals resulting in a depletion of the acid generating potential of these waste materials is presently being considered. The expenditures proposed in this decommissioning plan are adequate to meet expected costs; future technological developments should reduce these costs.

The closure options selected for the acid generating portions of the mine site are based on detailed hydrogeological investigations of each major component. Monitoring of these systems will continue for some years to ensure that the hydrogeologic conditions observed during the study period are representative.

The land use plan is based upon the current objective of the B.C. Ministry of Energy, Mines and Petroleum Resources, to return the land to a natural condition. It is recognized that this objective could change during the period of time prior to the closure of the mine and that the land use plan could be modified, excect where a proposed use could have a negative impact on the acid generation controls. Acid generation control is viewed as the primary goal of the decommissioning plan.

Westmin Resources Limited has undertaken to implement and monitor the effectiveness of many of the acid generation controls over the next five to seven years. Portions of the decommissioning program cannot begin until closure of the mine operations, however those activities which can proceed during the life of the mine will be completed earlier. Additional research activities to field test the shotcreted cementitious cover mixtures, and to define the hydrogeological conditions of the Myra Creek floodplain and the Myra/Price/H-W mining complex are continuing.

2.0 MINING PROGRAM

Westmin Resources Limited, Myra Falls Operations is a 3,650 tonnes per day copper-zinc gold-silver mine located near Butle Lake, 85 km from Campbell River on Vancouver Island. Mining began in 1966 with the development of the Lynx Open Pit, producing about 900 tons per day of copper-lead-zinc ore with gold and silver values as well. This pit operated until 1973, since then all mining has been underground. A second underground mine, the Myra Mine, was developed in 1970 and produced until 1985.

An extensive zone of copper-zinc mineralization was discovered in 1980 which resulted in the opening of the H-W Mine in 1985. This development required the establishment of new facilities including a 2,700 tonnes per day mill, which has since been expanded to 4,000 tonnes per day, and a 1.4 km conveyor to transport ore from the H-W shaft to the mill. The new mining complex also required an enhanced hydro-electric power development, an improved water control and treatment system, a new backfill plant and a new tailings disposal facility. Prior to 1984, tailings had been deposited subaqueously in Buttle Lake.

A small exploration development in the lower Thelwood Creek drainage, the Price Mine, includes 4 adits, one of which connects with the underground development in the Myra Valley. This operation has not been active since the early 1980's.

The present reserves of ore indicate at least a 10 year mine life for the Myra Falls Operations, however, as only 40 percent of the claims haveen explored and the Company has been quite successful in discovering more ore, it is anticipated that mining will continue for at least 20 years.

2.1 Milling Process

The mill, which has a 4,000 tpd capacity, employs tertiary crushing and two-stage grinding and produces copper and zinc concentrates through differential flotation. Tailings from the milling process are cycloned and the coarse fraction, approximately 50 percent by volume, is used as backfill underground.

2.2 Tailings Deposit

Prior to 1984, tailings materials were discharged to the south basin of Buttle Lake. The floculated fine tailings were discharged below the thermocline via a submerged outfall.

Studies indicate that the tailings on the lake floor were not releasing dissolved metals into the overlying water column during the time when this tailings deposition was occurring. Studies carried out in 1989, indicate that the tailings on the lake bottom are now being covered with a veneer of organic-rich sediments at a rate of approximately 4 mm/yr, and that the tailings deposits are anoxic below depths of 2 or 3 cm and are having a negligible impact on water quality in the lake.

Beginning in July 1984, tailings were deposited on land into the tailings storage facility.

Using a sub-aerial technique, the fine portion of the cycloned tailings material is deposited

through spray bars along the outer tailings embankment and allowed to drain. As increased storage capacity is required, additional confining berms are constructed above the elevation of the starter embankments. They are placed directly in successive lifts on the previous embankment with an overlap on the tailings adjacent to the embankment to form an engineered structure.

A sloping sand filter was constructed against the waste rock dump and valley side along the north side of the tailings disposal facility. The primary purpose of the filter is to decant supernatant run-off from the surface of the tailings and to intercept contaminated seepage from the waste rock dump, and carry the flows to the under-drains for treatment.

Piezometers installed into the tailings indicate that all structural zones of the tailings mass are fully drained and consolidated. If excess pore pressures were indicated by the piezometers, vertical drains could be installed along the confining embankments to dissipate excess pore pressures in the tailings and increase the factor of safety against liquefaction failure. To date vertical drains have not been required.

2.3 Waste Dumps

The majority of waste rock and overburden at the mine site was generated between 1966 and 1975 during the development and mining of the Lynx open pit. This waste has been stockpiled adjacent to and within the open pit. Much smaller volumes of waste rock are generated by underground mining and most of the H-W waste is used underground as backfill. The waste rock is a mixture of variable basic volcanic rocks and felsic sericite schists – some of which have a high sulphide content and high acid-generating potential. Non-acid generating waste rock is used in the construction of tailings pond berms.

2.4 Stockpiling of Soil and Overburden

The construction of the tailings deposition area involved the removal of approximately 200,000 m^3 of fluvial soil materials. These materials were stockpiled to the east of the tailings area for use in the reclamation of the mine site.

2.5 Drainage Control

To minimize the amount of water entering the mine area from the slopes to the north of the mine site, an interceptor ditch was constructed up slope of the former Lynx surface

operations to convey surface flows away from the area of disturbance and into Myra Creek downstream of the tailings facility. In addition, two interceptor under-drains have been placed under the tailings area to prevent contaminated ground water from reaching Myra Creek. Water is pumped from these under-drains to the water treatment system.

2.6 Water Treatment Systems

The water treatment system employed at the mine site consists of two components: a primary treatment and settling pond, the Lynx Pond, and six polishing ponds, the Myra Ponds.

The Lynx Pond is supplied by mix tanks, which combines high pH discharges from the milling process with low pH mine water and ground water. Lime and/or CO_2 can be added to the mix tanks for pH control. Accumulated precipitates are removed from the Lynx Pond and Myra Ponds by a floating, automatically controlled pump which discharges sludges to the tailings area. Effluent is decanted sequentially through the six polishing ponds and then is discharged into a common channel. A pumphouse recycles clean water from this channel back to the mill with the excess discharged to Myra Creek.

3.0 OBJECTIVES FOR DECOMMISSIONING PROGRAM

The intent of this plan is to provide environmentally secure decommissioning of the site, and to minimize long term acid drainage and on-going water treatment. The plan is based on on-going research and monitoring programs.

The design objectives for the decommissioning program at Myra Falls Operations are:

- to provide long term maintenance free water management measures to ensure acceptable water quality in the area.

- to integrate the disturbed lands into the surrounding landscape; and

- to return the land to native vegetation.

4.0 LAND USE

The location of the mine within Strathcona Provincial Park determines the potential uses of the land after mining. The objective of the B.C. Ministry of Energy, Mines and Petroleum Resources, is for the land to be returned to a natural condition including the establishment of

plant species which will initiate the natural successional patterns of local ecosystems.

The acid generating wastes will be sealed and covered with soil and natural vegetation. The vegetation will protect the integrity of the seal which is necessary to ensure the control of acid generation. The development of early successional vegetation communities will provide wildlife habitat, particularly for deer, elk and bear. The control of acid generation at the mine site will ensure that the water quality of the groundwater and Myra Creek will support a healthy downstream aquatic environment.

Mine related structures will be removed and the sites reclaimed to meet these land use requirements. The only exceptions will be the main road into the mine site which will be left open for park access, and the road and dams at Jim Mitchell and Thelwood Lakes which will be retained to support the current new alpine fishery and to supply power for long term water treatment and monitoring facilities.

5.0 ACID DRAINAGE CONTROL

5.1 Introduction

In order to understand, and to develop closure options for the acid-generating components, detailed hydrogeological investigations were conducted on each major source of acid generation at the Myra Falls Operations.

The primary acid-generating components at Myra Falls are

- Lynx Pit, containing Waste-Rock Dumps #2, #3 and #4
- Lynx Underground
- Waste-Rock Dump #1

Other potentially acid-generating mine components include the Myra mine, the H-W mine and the tailings. These areas will be assessed in a proposed hydrogeologic study to be initiated in 1992.

The specific objectives of the hydrogeologic study for each component were:

- to delineate variations in water movement and water quality in and around the Lynx Pit and Lynx Underground,
- to define the water balance and the evolution of water chemistry of inflow waters in and

around Waste-Rock Dump #1, and

- to assess the hydrogeological impacts of the Myra Falls Tailings Impoundment.

Each component was found to have unique physical and geochemical characteristics, which were used to select the most appropriate closure option to minimize acid drainage.

The objectives of the closure options are to:

- reduce all water inputs into the components that can be reasonably controlled,
- capture and treat most flowpaths of acidic water leaving the components,
- remediate contaiminated water quality in the remaining flowpaths, and
- redirect good quality waters from the Lynx Underground into Myra Creek, and reduce volumes of mine water going to the treatment plant.

5.1.a Lynx Pit

The Lynx Pit was excavated laterally into the northwest wall of Myra Valley. It is open on the south end and not entirely surrounded by rock walls. Precipitation into the Lynx Pit area was found to be a primary source of water to the Lynx Underground and is suspected to be a source of water to the Myra Creek floodplain beneath the tailings.

The closure option for the Lynx Pit must address the following specific criteria:

- minimize water reaching pit walls,
- remove good quality water from the surface of the pit before it can enter acid generating areas, and
- minimize water flow through the fill.

5.1.b The Lynx Underground

The closure option for the Lynx Underground must address the following criteria:

- isolate primary zones of acid-generating rock,
- reduce oxygen flow on deeper levels to minimize oxidation,
- prevent seasonal flushing of oxidation products in acid generating areas, and
- minimize stagnant water on upper levels where flooding may not be feasible due to the extent of fracturing within the pit area.

The selected option to meet these criteria involves:

- sealing walls, stopes, raises, etc. with cementitious sealant and/or cemented backfill, and divert water away from acid generating areas to other levels where necessary,
- submerge deeper levels with water and reduce oxygen inflows, and
- divert water from the upper Diversion Ditch as necessary to flood underground workings where possible and minimize stagnant water on upper levels which cannot be easily flooded.

5.1.2 Waste-Rock Dump #1

The primary waste-rock dump at the minesite, Dump #1, was constructed against the northern valley wall and rises up to 42 metres above the original land surface. It contains more than 10 million tonnes of mine rock from all of the mine workings and consists of an upper lift, a partial middle lift, and a lower lift directly adjacent to the tailings impoundment. This dump is still active, currently receiving rock from the H-W Underground.

Because most of the waste rock is capable of generating net acidity, significant amounts of acid water are flushed downward through the dump during heavy rainfalls and snowmelt. This water then mixes with, and overwhelms, the pH-neutral groundwater at the water table producing a greater volume of acidic water.

The specific criteria to be met by the closure options are:

- minimize water inflows into and through the dump, and
- if ongoing monitoring indicates it is necessary, minimize water-table fluctuations within the dump.

The selected closure option to accomplish this involves:

- covering the dump with a cementitious or other sealant, and
- if necessary, control of water-table fluctuations could be achieved, for example, by excavating free-draining drifts behind the valley wall for drainage and water-table control.

Further engineering studies, testing and monitoring are required to refine the cover design.

5.1.3 Tailings Impoundment

A detailed hydrogeologic investigation of the surficial tailings conducted by Environment Canada in 1990 indicated that significant portions of the surficial tailings were capable of generating net acidity.

The criterion to be met by the closure option is:

- To minimize acid generation and migration of any acidic water through or from the tailings.

Based on the environmental liabilities and risks involved for all options, a cementitious cover has been selected as the closure option. Establishment of stable soil and vegetation on the cover would enhance the ability of the cover to limit the flow of water and oxygen. A drainage system will be established on the surface of the tailings prior to the application of the sealant. The water from the tailings area surface will drain into a collection system which will release the water into the main diversion ditch and ultimately into Myra Creek.

The emergency Lynx tailings impoundment, adjacent to the Lynx settling ponds, will be removed and the tailings placed in the main tailings impoundment. Since this emergency facility is no longer necessary for the operation of the mine, the decommissioning and revegetation of this facility is proposed to be undertaken during operations and prior to mine closure.

5.2 Sealant Technology

A variety of materials have been proposed for use as covers or seals for reactive waste rock and tailings; including soils, synthetic membranes, compacted clay and till, asphalt and concrete.

Design objectives for a dry cover capping system for control of acid rock drainage would require that the material:

- is easily applied
- is durable
- has good ductility
- has reasonable compressive strength
- is chemically resistant
- has low permeability to air and water
- is economical
- is compatible with revegetation programs.

Cementitious sealants have the potential to meet these criteria.

Westmin Resources Limited has been researching, developing and testing a cementitious cover which incorporates mine waste materials, specifically; mine tailings and sludge from the water treatment system.

The research program has led to the design of a shotcrete mix which can be applied to vertical or sloped rock and dump faces. A large scale test of this shotcrete technique is proposed for the 1992 field season. This study will evaluate the effectiveness of the cementitious cover to restrict acid generation and to evaluate material properties such as durability, weatherability and permeability.

6.0 WATERCOURSES

All watercourses, natural and constructed, will be left in a sustainable, maintenance-free, condition. The water quality of these watercourses will be ensured through control of acid

generating materials. Some watercourses will be returned to original drainages, while others will remain diverted in secure channels.

7.0 STABILITY OF ENGINEERED STRUCTURES

The engineered structures which will remain after decommissioning of the mine site are the tailings impoundment and the rockfill in the Lynx pit.

The tailings embankment was designed for long-term safety against seismic activity, specifically to resist deformation in a magnitude 7.5 earthquake. Subsequent testing of the tailings concluded that the tailings as deposited meet or exceed all design assumptions.

An engineering design study will be undertaken on the proposed rockfill of the Lynx Open Pit with waste rock. This study will design the underdrains, and appropriate slopes for the surface sealed rock.

8.0 ROADS

Two access roads will be left after decommissioning the mine; the main access road to Myra Creek and the access road to Jim Mitchell Lake. The British Columbia Ministry of Environment Lands and Parks will assume responsibility for these roads. All other small access roads will be reclaimed to meet the land use objective of the land unit in which they occur.

9.0 MINE STRUCTURES AND EQUIPMENT

All of the equipment will be removed from the site and the buildings dismantled. Any acid generating material comprising fill in the buildings or yards areas will be excavated and transported to the Lynx Open Pit or #1 Waste Dump where it will be sealed with the other materials in those sites.

The surface openings of all mines will be permanently sealed for public safety as well as part of the acid generation control.

10.0 SCHEDULE OF DECOMMISSIONING

The proposed schedule for the decommissioning of the mine site is currently undefined because the date of closure of the mine is unknown and other details are not all resolved. It

is the intent of Westmin Resources Limited to carry out all decommissioning activities in a timely fashion upon closure of the mine and to decommission all areas which can be decommissioned prior to mine closure. The control of the acid generation in these areas will reduce the amount of water which requires chemical treatment. This will reduce the amount of water treatment required and will also allow the evaluation of the performance on the acid generation control methods prior to the closure of the mine.

11.0 DECOMMISSIONING COSTS

Costs have been estimated for the various components of the mine closure based on the techniques believed to be the best options at this time. However, the approach proposed is considered to be an expensive solution and new technological developments should reduce these costs. Details of the costs are presented in the following table.

TOTAL ESTIMATED CLOSURE COSTS	
Lynx Pit	$ 4,608,000
Lynx Underground	6,450,000
Waste Dump #1	1,514,500
Tailings (surface & berm)	4,535,600
Myra Creek Floodplain	1,000,000
Mill and Mine Site	1,602,000
Roads	153,000
Water Treatment Ponds	611,500
Price Mine	366,800
Tennent Lake & Penstock	327,900
TOTAL COST	$21,169,300

12.0 MONITORING REQUIREMENTS

Surface water quality monitoring will continue throughout the life of the mine; at the time of mine closure an appropriate sampling program will be determined in conjunction with the Ministry of Environment, Lands and Parks. Quarterly water quality sampling will continue in Waste Dump #1 and the Lynx Underground to confirm the results obtained in the hydrogeology studies to date.

Revegetation success on all reclaimed sites will be monitored to determine species survival and productivity.

Appendix F

List of Permits and Licences

Ministry of Energy, Mines and Petroleum Resources

Reclamation Permit M-26

Ministry of Environment, Lands and Parks

BC Environment

Water Licences

C029102	Tennent Creek	Power Generation
C032063	Tennent Lake	
C043113	Webster Creek	
C043379	Amica Creek	
C058458	Myra Creek	
C064123	Thelwood Creek	
C064124	Patchette Creek	
	Moulder Creek	
	Tennent Creek	
	Ellis Lake	
	McNish Lake	
	Griffiths Lake	
C061484	Myra Creek	
C063974	Thelwood Creek	
Z1012665	Myra Creek	

Waste Management

PA-2408	Air contaminants
PR-2561	Discharge of refuse to land
PE-6858	Effluent discharge

BC Parks

Park Use Permit 1261	Power development and generation
Park Use Permit 1363	Mining
Park Use Permit 1364	Power development and generation

The permits and licenses may be viewed at the regional office of the issuing agency. Arrangements must be made prior to viewing.