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Federal Environmental
Assessment Review Office

CP Rail Rogers Pass Development

Glacier National Park

Canada

PANEL REP-ORTS TO THE MINISTER OF THE ENVIRONMENT ON THE PANEL PROJECTS

1. Nuclear Power Station at Point Lepreau, New Brunswick. (May, 1975)
2. Hydro Electric Power Project, Wreck Cove, Cape Breton Island, Nova Scotia. (August, 1976)
3. Alaska Highway Gas Pipeline Project, Yukon Territory. (Interim report, August, 1977)
4. Eldorado Uranium Refinery Proposal, Port Granby, Ontario. (May, 1978)
5. Shakwak Highway Project, Yukon Territory — British Columbia. (June, 1978)
6. Eastern Arctic Offshore Drilling — South Davis Strait Project, N.W.T. (November, 1978)
7. Lancaster Sound Offshore Drilling Project, N.W.T. (February, 1979)
 - a. Eldorado Uranium Hexafluoride Refinery, Ontario. (February, 1979)
9. Roberts Bank Port Expansion, British Columbia. (March,, 1979)
10. Alaska Highway Gas Pipeline, Yukon Hearings. (August, 1979)
11. Banff Highway Project (east gate to km 13). Alberta (October, 1979)
12. Boundary Bay Airport Reactivation, British Columbia. (November, 1979)
13. Eldorado Uranium Refinery, R.M. of **Corman** Park, Saskatchewan. (July, 1980)
14. Arctic Pilot Project (Northern Component) N.W.T. (October, 1980)
15. Lower Churchill Hydroelectric Project. (December, 1980)
16. Norman Wells **Oilfield** Development and Pipeline Project. (January, 1981)
17. Alaska Highway Gas Pipeline, Yukon Territory (July, 1981) (Routing Alternatives Whitehorse/lbex Region)
- 18.** Banff Highway Project (km 13 to km 27). Alberta (April, 1982)
- 19.** **Beaufort** Sea Hydrocarbon Production Proposal (Interim Report) (April, 1982)

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Federal Environmental Assessment Review Office
200 **Sacre-Cœur** Blvd
Hull, Quebec
K1A OH3

@Minister of Supply and Services Canada **1982**

Cat. No. En 105-22/1982

ISBN O-662-51 872-I



Government
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Gouvernement
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Environmental
Assessment Review

Examen des évaluations
environnementales

Hull, Quebec
K1A OH3

The Honourable John Roberts, P.C., M.P.
Minister of the Environment
Ottawa, Ontario
K1A OH3

Dear Minister,

In accordance with the mandate you provided on February 24, 1982, the Environmental Assessment Panel has conducted a preliminary review of CP Rail's proposed development project in Rogers Pass. We are pleased to submit the Panel's report for your consideration.

The proposal would eventually result in a second main track 34 km long in Glacier National Park. The proponent wishes to undertake preliminary works during 1982 so that the overall construction project could commence the following year.

Information provided by CP Rail has been examined and public meetings held in Vancouver, Revelstoke, Golden and Calgary. The Panel's evaluation has led to the conclusion that, subject to a number of conditions, certain activities could proceed in 1982 without prejudicing a final recommendation as to the best way for the project to proceed.

It has been concluded that work on the east and west portals of the proposed 14.5 km tunnel, construction of a 15 m wide access road along the proposed right-of-way and establishment of a work camp are acceptable. However, this would require an Environmental Committee to be established and an Environmental Coordinator on-site prior to any construction to ensure detailed plans and construction activities meet expectations.

Further studies are required to address issues of major concern that have been identified. These include the noise and visual effects of the proposed tunnel ventilation stack, terrain impacts along the surface route, rehabilitation of the proposed right-of-way and social issues. Upon receipt of this information the Panel will be able to complete its public review and advise how the overall effect on the environment can be minimized.

The Panel considers it necessary to advise at this time that further study on the ventilation stack location should be concentrated in the area of the alternative proposed by CP Rail, as the original proposal is unacceptable in a National Park setting.

Respectfully yours,

P. J. Paradine
Chairman
Rogers Pass
Environmental Assessment Panel

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Cat. No. En 105-22/1982

ISBN O-662-51872-1

CP RAIL ROGERS PASS DEVELOPMENT GLACIER NATIONAL PARK PRELIMINARY REPORT

1. THE REVIEW PROCESS

1.1 Introduction

On February 24, 1982, the Minister of the Environment requested the Executive Chairman of the Federal Environmental Assessment Review Office (FEARO) to form an Environmental Assessment Panel to review the environmental and related social impacts of the proposed Rogers Pass Development Project. The terms of reference issued for the review are provided in Appendix I.

In referring this project to FEARO, the Minister expressed the view of the government that it is in the national interest for this project to proceed quickly but stressed that it is important that any effects on the environment be minimized. He also noted the need to provide an opportunity for interested persons to express their views on the best way for the project to proceed and thereby influence the development of mitigation measures.

The terms of reference recognize the urgency associated with completing the environmental assessment review and state that in order to avoid delaying the project, the procedures normally followed by Environmental Assessment Panels have been altered. The Panel was instructed to identify the activities which CP Rail (the proponent) might immediately undertake without prejudicing a final recommendation as to the best way for the project to proceed. At the same time, the Panel was asked to identify any issues of major concern for which additional information is required in order that a final report can be submitted at a later date recommending how environmental impacts can be minimized. Notwithstanding the importance of this project, the Minister recognized that it is essential that work which might prejudice good environmental design not be undertaken before the Panel completes its final report. This preliminary report has been prepared in accordance with the above instructions.

1.2 The Panel

On March 4, 1982, the Minister announced the commencement of the review and the appointment of Philip

Paradine as Chairman of the Panel. Two other members, William Ross and George Tench, were appointed to the Panel on March 10. A short biography of the Panel members is included in Appendix II.

1.3 The Review

In accordance with the terms of reference, the Panel and its secretariat proceeded immediately to begin the review. The Panel Secretary visited the communities of Revelstoke and Golden during the week of March 8 to inform people in the area of the review. A series of advertisements were placed in newspapers in the immediate area of the project as well as in Vancouver and Calgary. These notices advised on the nature of the review, availability of documentation, and the times and locations of the public meetings. The secretariat ensured that the public libraries in Vancouver, Revelstoke, Golden and Calgary received prior to the public meetings the following documentation:

1. Initial Environmental Evaluation, CP Rail Grade Improvement, Rogers to Cougar Creek;
2. Rogers Pass Tunnel Conceptual Ventilation Study by Parsons, Brinckerhoff, Quade and Douglas Inc.;
3. Revised Air Quality Assessment, Rogers Pass Tunnel by Environmental Sciences Limited;
4. Preliminary Geotechnical Evaluations: Surface Grade, Rogers Pass Revision by Thurber Consultants Ltd.;
5. Rogers Pass Tunnel 1980 Geotechnical Investigation by Thurber Consultants Ltd.;
6. Parks Canada Position Statement in the Matter of CP Rail Application to the Canadian Transport Commission for Rail Grade Improvements Rogers to Cougar Creek;
7. Letter of March 9, 1982, to the Panel Secretary, Guy Riverin, from M.S. Wakely, Regional Engineer, CP Rail outlining the proposed work in 1982;

8. Various press releases and information notices associated with the review.

This information was also provided to interested individuals, non-government organizations, government agencies and independent experts engaged by the Panel to assist in the review.

To familiarize themselves with the proposed project, the Panel, along with officials of CP Rail and Parks Canada, visited the project site on March 30.

Public meetings were held in Vancouver on April 13, in Revelstoke on April 14, in Golden on April 15 and in Calgary on April 16. In Vancouver, the technical review focussed on the tunnel ventilation concept, air quality and noise. In Calgary the main topics included terrain impact, hydrology and avalanches. General sessions were also held in Calgary and Vancouver. The meetings

in Golden and Revelstoke were general sessions at which presentations were received on avalanches, wildlife and social impact issues.

Presentations were made by individuals, public groups, local government representatives in Golden and Revelstoke, the Member of Parliament in the project area, the United Transportation Union, independent experts engaged by the Panel, Parks Canada, Environment Canada, CP Rail and consultants engaged by CP Rail. Approximately 450 persons attended the meetings and 52 persons made appearances before the Panel. Those who appeared as well as others who submitted written briefs are listed in Appendix III. A considerable amount of new information was submitted to the Panel during the meetings. It is listed in Appendix IV. Verbatim transcripts were made of the proceedings and are available through the Federal Environmental Assessment Review Office.

2. THE PROJECT

2.1 Project Setting

Glacier National Park is located in the Selkirk Mountains in the province of British Columbia. The Park is dedicated to the preservation of a magnificent area of mountain peaks and massive glaciers. It contains more than 400 glaciers, few of which are visible to travellers along the Trans Canada Highway, except for the Rogers Pass area. High snowfall maintains these glaciers and also creates the renowned avalanche phenomenon in Rogers Pass. The Columbia Rain Forest in the Park is becoming a more precious natural resource as its extent is being reduced by resource development elsewhere in British Columbia. The Park is also famous for its grizzly bears whose habitat is being reduced outside the Park.

The dominant uses in the Park are recreation and transportation. The pass was discovered by Major General A.B. Rogers in 1881 in his search for a route for the railway and has been used as a transportation corridor ever since. Glacier National Park was created in 1886. During the 1950's, the Trans Canada Highway was constructed through the Park.

The nearest communities to the east and west of the Park are Golden (population 3 300) and Revelstoke (population 4 900) respectively. Golden's economy is based on forestry operations, transportation (CP Rail and highway maintenance) and tourism. Transportation, tourism and service industries constitute the main economic base in Revelstoke.

2.2 Project Description

CP Rail has proposed construction of a second main track, 34 km in length, from Rogers west through Glacier National Park. The eastern 3 km would be built on Provincial Crown land. This review deals with the proposal within the National Park boundaries. (See Figures 1 and 2.)

The alignment selected by CP Rail would commence at Rogers and parallel the existing main track at a 1% grade to Stoney Creek. It would enter a 1.8 km tunnel 0.8 km west of Stoney Creek and exit under the Trans Canada Highway. The route would continue across Connaught Creek to the base of Mount Macdonald and

enter a 14.5 km tunnel known as the Rogers Pass Tunnel. At the western end (west portal) of the tunnel it would cross under the Trans Canada Highway and connect to the existing track. The alignment selected by CP Rail was an integral part of the Canadian Transport Commission decision and the Panel limited its review to this alternative.

The proposed second track and tunnel would require construction of a number of associated structures and facilities. These are: a ventilation stack for the tunnel near the Trans Canada Highway in Rogers Pass, fan houses, a 69 000 volt power line to the tunnel, a standby power supply (diesel generator), 13 bridges (11 within the Park), installation of numerous culverts, a temporary detour of the Trans Canada Highway at the western portal of the tunnel, approximately 2 km of retaining walls, upgrading and construction of new access routes to the construction area, and two work camp sites (Beaver and Flat Creek) each housing up to 250 men within the Park.

CP Rail has proposed commencement in 1982 and completion in 1986 at a cost of approximately \$550 million (\$ 1982).

2.3 Project Rationale

CP Rail's capacity analysis has led it to conclude that the forecast traffic demand by 1985/86 will be greater than the present potential operating capacity of the mainline. The Railway Transport Committee of the Canadian Transport Commission, in its decision in March 1982 approving this project, was strongly convinced of the necessity of the project.

The present rail configuration in the Rogers Pass area which consists of a single track and grades of up to 2.6 % , is not capable of handling projected demand. CP Rail's examination of alternatives to increase the rail capacity has led to the proposal to construct a second main track for westward bound trains at a maximum grade of 1% . The reduced grade and the additional section of double track would provide an increase in the capacity of the CP Rail system. In view of the Canadian

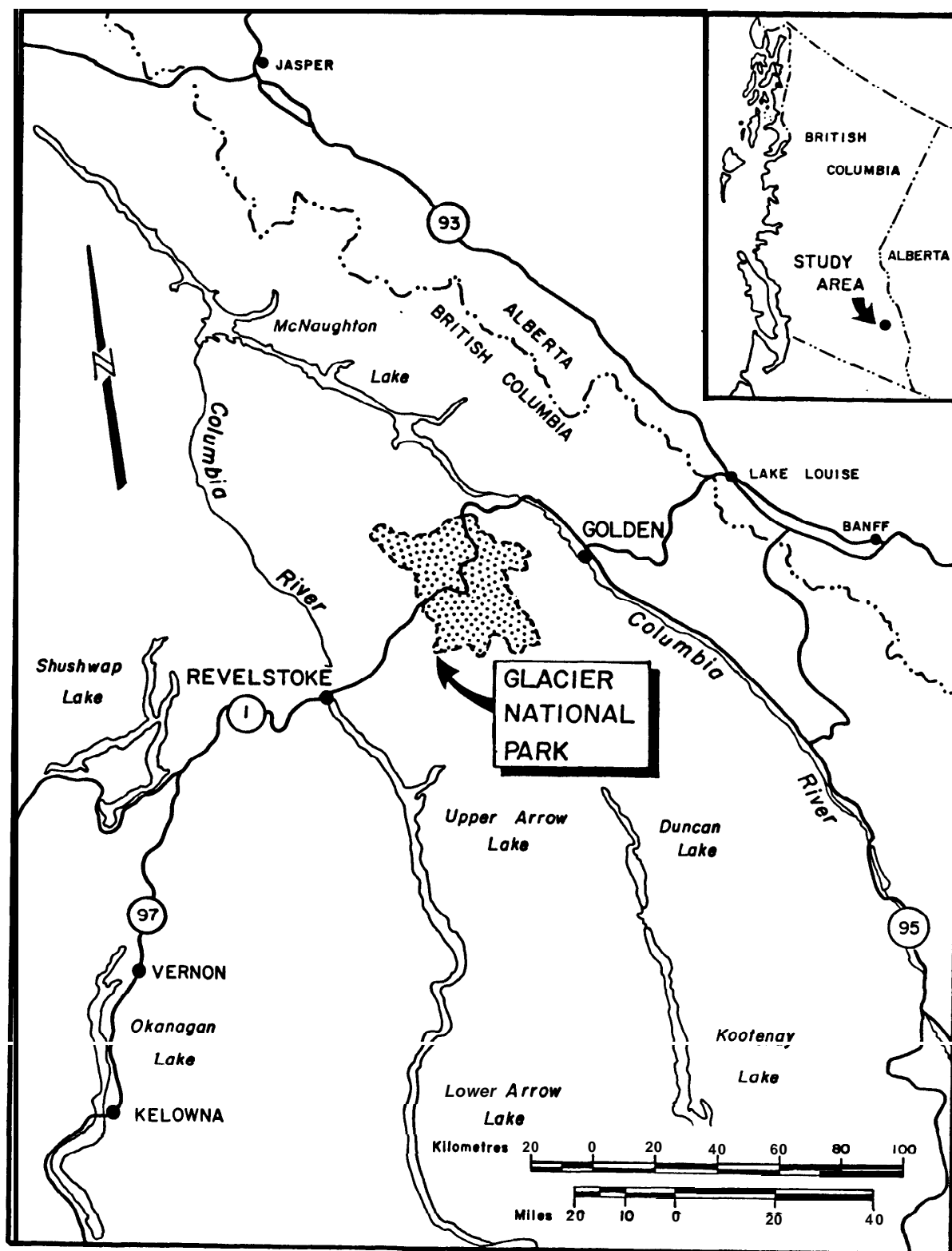


Figure 1-Location of Glacier National Park

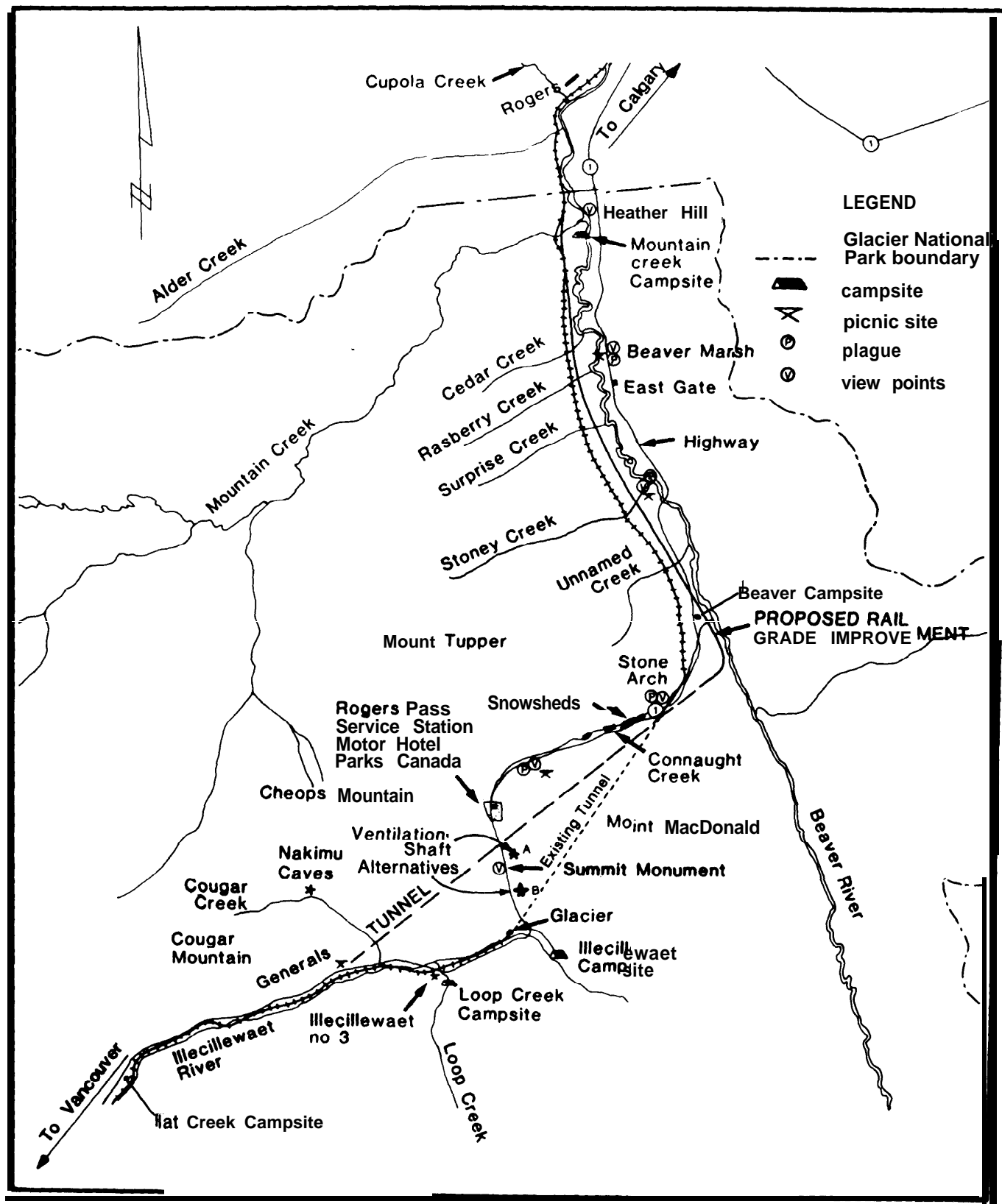


Figure 2-location of CP Rail Rogers Pass Development

Transport Commission decision and the terms of reference provided by the Minister the Panel has not examined the project rationale further.

2.4 1982 Construction Program

One of the Panel's immediate tasks is to identify the activities which may be commenced by CP Rail during the 1982 construction season.

CP Rail outlined its proposed construction program in a letter of March 9, 1982, to the Panel Secretary. The program is summarized as follows:

i) Surface route

CP Rail proposed a 30 metre right-of-way clearing and construction of an access road along the surface route (16.5 km). This road would enable the geotechnical investigations which are required for completion of a comprehensive design of the bridge structures, the earth cuts and fills, and the location of retaining walls. The access road would require construction of five temporary bridge structures and several culverts which would be removed upon completion of the railway grade.

ii) East Portal

At the eastern end of the tunnel, CP Rail proposed excavation of the overburden to expose the rock face.

This would enable the actual tunnel construction to commence in the spring of 1983. Removal of the overburden would require construction of a permanent concrete retaining wall 55 metres long and 10 metres high. A temporary 92 metre long retaining wall would also be constructed to minimize the volume of material to be excavated. This wall would remain until the door structure is completed. The excavated material would be used to form a foundation for a fan house and electrical transformer station. A 91 metre permanent retaining wall would also be constructed in conjunction with the foundation.

iii) West Portal

At the western end of the tunnel, CP Rail proposed construction of a concrete structure under the Trans Canada Highway and approximately 222 metres of tunneling through soft ground and rock. This construction would occur between the surface grade and the tunnel face. It would require a 427 metre detour of the Trans Canada Highway.

iv) Work Camp

CP Rail proposed establishing a work camp at Flat Creek approximately 6 km west of the west portal, adjacent to the Trans Canada Highway.

3. ISSUES

3.1 Introduction

In this section, the Panel has identified those works that can proceed in 1982 subject to certain conditions as well as further major information required in order that a final report can be submitted at a later date. An overall requirement is for a more comprehensive schedule of construction activities after 1982. It is possible that during the remainder of this review further issues may arise which CP Rail should be prepared to address.

3.2 The Rogers Pass Tunnel

Rail traffic on the proposed track would move in a west-bound direction. At the entrance to the tunnel (the east portal), a structure would be built which would include a door system and an exhaust fan and housing. These facilities are required for the proposed tunnel ventilation system (Section 3.3). Air from the eastern half of the tunnel would be vented from the east portal. Air from the western half would be vented from the stack. To construct the east portal, it would be necessary to excavate through soft ground to the rock face. The portal would be approximately 1 400 metres from the Trans Canada Highway and would not be visible to passing motorists.

At the exit from the tunnel (the west portal) the railway would pass under the Trans Canada Highway. To facilitate construction of the underpass and gain access to the rock face, the Trans Canada Highway would be detoured temporarily. Although the west portal would not have the same facilities as the east portal, it would be visible from the Trans Canada Highway. Passing motorists will undoubtedly be interested in the construction activity and may wish to stop to view it. Parks Canada has proposed construction of a temporary viewpoint to enable visitors to look at the construction progress. CP Rail has indicated a willingness to assist in the provision of interpretive facilities. The Panel recognizes that the construction activity in this area, particularly the detour, may disrupt traffic flow and recommends that every effort be made to minimize the disruption during July and August.

The west portal would be located in the middle of the Ross Peak slide path, the largest avalanche path in the

area. In recognition of this, CP Rail has modified its plan to ensure that there are no permanent buildings outside the tunnel. Temporary fans and generators would be placed inside the tunnel after 1982 summer construction. In addition an escape hatch would be built to allow construction personnel to leave in the event that an avalanche blocked the tunnel exit. It is important that consultation between Parks Canada's avalanche control personnel and CP Rail continue so that the best possible avalanche control program can be implemented to ensure the safety of construction workers in the area. Such a program would likely involve the deliberate triggering of avalanches to prevent the unexpected release of much larger quantities of snow. This would mean evacuation of construction personnel and would require close cooperation between the contractor and Parks Canada. CP Rail has agreed to fund two people to assist in the avalanche control function. While there has been considerable discussion on control measures during construction, the Panel requires further information on the avalanche control measures planned once the railway is operational.

During the 1982 construction period, excavated material would be used as a base for the fan house at the east portal and for construction of a rail yard facility at the west portal.

Excavated material from the tunnel would be temporarily stored at each portal and then spread as fill. Material from the eastern section of the tunnel would be used along the new surface grade. Material from the western section of the tunnel would be spread along the existing track bed to widen it. Further information is required by the Panel on the impact of the disposal of material from the main tunnel construction that is proposed to start in 1983.

Tunnel drilling would require approximately 45 000 litres/day of water. The wastewater would be directed to settling ponds for removal of suspended matter prior to discharge. Further information should be provided to the Panel on water sources, the design of the settling ponds, their operation, expected effluent quality, the discharge course from the ponds to the receiving stream and the impact on the receiving streams.

Further information is **also** required by the Panel on the production and use of concrete including source and quantity of aggregate, locations of batching plants and pollution controls.

The Panel concludes that construction of the east and west portals in 1982 would not be prejudicial to the selection of mitigation measures for the project provided that detailed plans are carefully reviewed, avalanche control measures are implemented and construction is strictly supervised. Approval and supervision procedures for the 1982 construction program are discussed in section 3.6. Access to the east and west portals from the Trans Canada Highway has been agreed by CP Rail and Parks Canada.

3.3 Ventilation Shaft

In order to reduce the time between passage of successive trains through the tunnel, CP Rail has proposed construction of a ventilation shaft exiting from the tunnel approximately at its mid-point. This would provide air flow through the tunnel to cool the train engines, maintain a safe air quality within the tunnel and allow purging of pollutants after the train passage. The panel recognizes the need for the ventilation requirements proposed by CP Rail. However, it also believes that the proposed ventilation shaft with a large surface structure could present a significant visual intrusion to the natural splendor of Rogers Pass,

CP Rail originally proposed locating the surface structure about 430 metres from the Trans Canada Highway opposite the Rogers Pass monument (location A, Figure 2), on the face of 'Avalanche Mountain (Mount Macdonald). It would be highly visible to the thousands of visitors who annually stop at the monument to view the beauty of the area. Concern regarding the location of the proposed structure has led CP Rail to examine another area, approximately 900 metres to the south of location A but closer to the Trans Canada Highway (location B, Figure 2). This alternative promises to have less visual impact than the original proposal since it will be further from the summit monument and located in a treed area. However, CP needs to gather further information in order to determine the exact location of the shaft in this area.

Although location B would reduce the visual impact it is possible that the stack structure or its plume would be visible under certain conditions to visitors who stop along the highway to admire the scenery. The Panel at this point can only speculate what the visual impact may be and therefore it requests CP Rail to demonstrate its claim that the surface structure can be completely screened from the highway, the summit monument and Glacier Park Lodge Hotel.

The visual intrusion that the proposed stack structure would create at location A is not acceptable.

The emissions from the proposed vent stack were of concern to a number of people. Discussions at the public meetings involving the Panel's and CP Rail's independent experts have led the Panel to conclude that air pollution would not be a significant problem.

There was concern expressed as to the noise level that would exist at various locations (e.g. certain nearby hiking trails, the summit monument) used by Park visitors. CP Rail has not conducted measurements of existing levels of sound and therefore it is not possible to predict accurately the noise impact in the area of the vent surface structure. The Panel recommends that existing background levels in the summer be measured and the anticipated noise levels from the facility superimposed on the background noise. This information would allow determination of the level of attenuation that would be required. The Panel believes, however, that the noise can be sufficiently attenuated.

CP Rail originally proposed to house ventilation fans at the base of the shaft at location A. However, at location B it is proposed that the fans would be housed at the surface. Movement of the fans to the surface could increase noise levels. In considering the position of the fans, noise levels must therefore be taken into account.

The Panel also requires information on the location and nature of the access to the vent, fans, diesel generators, details of the structure, disposal of excavated material, and the relationship of the site to known avalanche paths.

The ventilation stack structure as well as tunnel portals, buildings, and fan outlets although not likely to be seen by large numbers of the public, should nevertheless receive careful and sympathetic architectural treatment in keeping with their setting in this magnificent Park.

If areas other than location B are proposed by CP Rail, then consideration must be given to the criteria mentioned above i.e. visual impact, noise, access roads, disposal of excavated material, and any avalanche protection requirements.

Given the significance of the proposed ventilation stack structure to the natural heritage of the Park, it is essential that further information be provided on its effects for review by the Panel.

3.4 Surface Route

From Rogers to the east portal of the Rogers Pass tunnel there are 16.5 km of surface grade and a 1.8 km tunnel under the Trans Canada Highway. This route lies

on the west side of the Beaver River Valley between the existing railway line and the Beaver River (see Figure 2.). The route crosses alluvial fans, steep glacial slopes, deeply incised gulleys, two bedrock landslides (the Griffith and an adjacent unnamed slide) and three avalanche zones.

Thirteen bridges with a total length of over 800 m cross rivers and gulleys which carry water from the glacial slopes to the west into the Beaver River. Large cuts and fills will be required along the route with the deepest cut being over 21 m while the maximum fill is over 17 m on the centre line and almost 32 m at the toe of the slope.

Material to be extracted from the east portal of the Rogers Pass tunnel will be used as fill between the east portal and Connaught Creek. A balanced cut and fill operation is expected between Connaught Creek and Rogers.

Preliminary designs for this section of the project have been developed including earthworks, retaining walls, rock cut plans, and cut and fill cross-sections. A centre line is currently set but some variations from it are expected. However, final design requires that further geotechnical investigations be undertaken. These include an assessment of avalanche hazards, hydraulic capacity of creeks crossed, possibility of debris torrents, bridge foundation details, and further information about landslide stability. In addition details of groundwater seepage and the suitability of material in cuts for borrow must also be determined in order to complete the engineering design for the surface route.

Access to the route will be constructed in 1982, as agreed to between Parks Canada and CP Rail, from Rogers and at Mountain Creek (the latter for work force but not for equipment). In addition the proponent has requested access along a surface route from the Trans Canada Highway near Stoney Creek.

CP Rail proposes to clear the right-of-way (30 m in width) for the entire length of the surface route. Trees greater than 15 cm in diameter would be cut and turned over to Parks Canada. Those between 5 cm and 15 cm would be cut into 2.4 m lengths and stockpiled at locations agreed to for use by Parks Canada as firewood. Other trees, shrubs and vegetation would be burned on the right-of-way. The cleared right-of-way would be grubbed to remove stumps, roots, debris and overburden. This clearing takes place in an area where, according to the proponent, the hemlock-cedar-fir vegetation is "unique to the interior region of B.C. in general and the Glacier National Park in particular." While unique, this vegetation community is neither rare nor endangered.

An initial access road approximately 4 m wide will be constructed to allow the logs to be decked (at 300 m intervals along the road). Initial geotechnical investigations will take place, the road would be widened to nearly 5 m and drainage will be installed to control erosion and protect the road surface. This road would allow heavier equipment to haul out the logs and to complete the geotechnical investigations. The road would be maintained to provide subsequent access for railway grade construction which would not start before June 1983.

Five temporary bridges and culverts as needed will be used for the road along the surface grade. These will all be replaced when the final grade is installed.

The most serious concern raised was related to the potential for terrain impact along the surface route and the difficulty of achieving satisfactory reclamation. The large cuts and fills constitute scars which will represent a negative visual impact for travellers on the Trans Canada Highway. These exposed surfaces will contribute to erosion of silt and soils into the streams and marshes along the valley floor. Until more information is collected there remains the possibility of large scale terrain manipulation in the Park in the area of the Griffith landslide. Water seepage causing slumping and other drainage problems is also possible. Finally, as the suitability of various terrain materials for borrow is unknown, there is the possibility of needing to waste unsuitable material and of requiring borrow from other sources. This lack of information about handling materials can easily lead to great difficulties and significant terrain disturbance at the time of construction.

These difficulties are well appreciated, however, and the proponent's plans for further geotechnical studies during the summer of 1982 are intended to gain sufficient information to complete the detailed design and to resolve these uncertainties. The Panel agrees with this approach and recommends that the geotechnical studies undertaken in 1982 be sufficiently thorough to answer questions relating to terrain disturbance. Following these studies the Panel expects that the proponent will be in a position to completely describe the terrain impacts and to outline the mitigation measures necessary to reduce the undesirable terrain impacts to a minimum. On the basis of detailed studies impacts can be anticipated and design changes can often be made to minimize these impacts. That must be one of the important goals of these geotechnical studies. As a result of these studies further engineering details will be available regarding location and size of retaining walls, the erosion potential of surface materials, and the volumes and types of materials to be moved. In addition quantities and sources for various types of borrow and the

amounts of waste materials, and where they will be disposed of, will be known. This information is required by the Panel for completion of its final report.

Once these terrain impacts are determined the proponent will be in a position to fully describe the visual impact of the various cuts and fills. This is best done by sketches or altered photographs of the area as seen from appropriate sites along the Trans Canada Highway such as Heather Hill. The use of a landscape architect in connection with this and other visual concerns is necessary.

One of the most important mitigation measures is effective reclamation. Exposed surfaces can often be revegetated and the negative impacts can be reduced. The proponent has developed various revegetation concepts to deal with this problem. The objectives of this plan include erosion control, aesthetic improvement, and the establishment of a self-sustaining vegetation cover. While the proponent has developed many examples of how this plan could be put into place, revegetation programs achieve maximum success when a detailed plan is prepared well in advance. This has not yet been done, even for the 1982 activities.

The Panel concludes that the proponent should immediately develop a reclamation plan for those areas that could be revegetated in 1982. Moreover, once the detailed geotechnical information becomes available, the detailed surface route design can be done. The Panel requires it also contain a detailed reclamation plan. This plan should include, but not necessarily be limited to the following details for each site dealt with:

- slope
- hydrology
- overburden
- surface soils
- original vegetation cover
- construction disturbance
- post construction terrain material
- interim environmental protection
- materials handling and storage
- access
- abandonment
- final contouring
- revegetation (native and introduced plants)
- soil replacement
- upkeep considerations

A "reclamation team" consisting of CP Rail and Parks Canada has already been formed to deal with issues of reclamation and revegetation. The creation of this reclamation plan is a very demanding task. It requires great

attention to detail but will allow the Panel to determine the ability of the proponent to successfully mitigate the terrain disturbance.

One means of reducing terrain impact involves less clearing, particularly in 1982. Technical experts suggested that 10 m would be sufficient to provide the main access for geotechnical work required. The Panel agrees that full clearing of the 30 m right-of-way is not necessary to provide an access road and would generally limit the clearing in 1982 to a width of 15 m. Parks Canada should be prepared to accommodate limited requests for further clearing where necessary because of geotechnical work, terrain constraints (such as deep gulleys), avoidance of nesting raptors, or topographic mapping work. Where creek or stream crossings are encountered, clearing during 1982 should be limited by Parks Canada in order to minimize erosion in these highly sensitive areas. These measures would significantly reduce the amount of land cleared in 1982 with a corresponding reduction in exposed and erodible soil. As some of this cleared land will remain exposed for some time this reduction could be a significant environmental benefit. It will also retain future options to shift or modify the right-of-way without impacting lands outside the right-of-way while at the same time allowing more than enough clearing to undertake the necessary geotechnical studies. Also, in case of unexpected project delays after the first year of work, this will minimize the impacts.

Clearing of the rest of the right-of-way should not take place until the further information required is fully reviewed by the Panel. The possibility of clearing less than 30 m or of staged clearing (only as much as is necessary at any one time) should be addressed by the proponent. Full clearing at this time would prejudice a final recommendation on the best way for the project to proceed.

In order to ensure that the road is constructed so as to minimize erosion, CP Rail's detailed proposal will require further examination. The mechanism for such review is described in Section 3.6. The Panel will require further information about maintenance of access roads after 1982. It is particularly important to know how this will be done in the case of a delay of the project for one or more years.

Some concern was also expressed for the treatment of stream crossings along the surface route and the impact of the route on the Mountain Creek campground and other facilities in the Park. It would appear that these issues have been largely resolved between CP Rail and Parks Canada. The Panel believes that these agreements are satisfactory.

The Stoney Creek access road requested by CP Rail is the only access route proposed to the area north of the Trans Canada Highway and south of Mountain Creek and would provide access to the short tunnel site. Failure to be able to use this route would require equipment to travel the length of the surface route and would make the work very difficult to complete expeditiously. On the other hand Parks Canada expressed several concerns about use of this particular access route including conflicts with grizzly bears, difficulty in revegetation, possible elk habitat, difficulty in making a safe intersection with the Trans Canada Highway and Parks Canada policy not to create new roads.

In spite of these difficulties the Panel urges Parks Canada to accommodate CP Rail in the matter of this access road. If there is no means of developing this road in an environmentally satisfactory manner, Parks Canada is urged to see if an alternate route into the surface route in this vicinity is possible. Parks Canada must ultimately be satisfied with the access route.

The surface route could also have an impact on wildlife and certain studies are required. Raptor nesting is underway and nests on or near the right-of-way should be protected by a 50 m band of trees until the young are fledged. A study to determine numbers, seasonal movement and use of the right-of-way by large ungulates could lead to mitigation measures to reduce kills on the railway. Plans should be made for emergency containment and removal of toxic spills which could enter the marsh ecosystems. Arrangements for these studies could be made through the mechanism discussed in Section 3.6 and this would not prevent work proceeding in 1982. However the Panel will require information from CP Rail on the results of these studies for consideration of work after 1982.

A power line is proposed to deliver electricity from east of the Park along the new right-of-way to the east portal of the Rogers Pass Tunnel. The Panel acknowledges the need for a power line but requires further information on the implications of burying all or parts of the transmission line.

3.5 Work Force

Three work camps are proposed for 1982. One at Flat Creek in Glacier Park was requested in CP Rail's letter March 9, 1982. At the public meetings a possible requirement for 1982 for the Beaver camp was identified. These camps would house the West and East portal construction crews. In addition the clearing and grade construction crews will be at Rogers, just outside the Park. The Beaver camp would occupy the former

work camp used during the highway construction. Flat Creek and Beaver would each contain approximately 30 people in 1982 and up to 250 in subsequent years. At the end of construction Parks Canada plans to retain parts of these installations for public use.

Both grizzly and black bears may be attracted to the work camps which could result in danger to the occupants and the need to trap, remove or destroy the bears. Flat Creek was identified as being a particular problem although bears could be attracted to camp sites in any location. To minimize this problem measures such as special fences, careful disposal of garbage, fume incinerators, training of work people and other precautions would be required. The effectiveness of these precautions will require monitoring by Parks Canada. The Panel concludes the Beaver work camp is a preferable site and should be permitted subject to prior provision of adequate precautions and approved design. However, should the results at Beaver be satisfactory and CP Rail's construction schedule demand, the Flat Creek camp could be installed in Fall 82. If problems are encountered at the Beaver camp, the Panel would require further information on sites outside the Park and away from grizzly bear habitat.

A problem to be addressed during the design stage is the water supply and sewage systems. The availability of water from nearby streams to supply the work camps requires investigation. Sewage treatment plants are proposed with effluent discharged into Connaught Creek (Beaver) and Illecillewaet River (Flat Creek). The acceptability of this approach requires investigation prior to camp installation.

The Panel noted concerns of intervenors regarding the impact of the construction force on their communities. Mention was made of past problems and the need to prevent these by adequate policing. CP Rail noted they could only police their own property and policing generally is the responsibility of the RCMP. A particular problem mentioned was the distance the RCMP would have to travel to reach the Park. This impact requires monitoring during the 1982 construction period to assist in determining any additional requirements.

A number of other social concerns were raised which require further investigation by CP Rail and will be reviewed by the Panel when additional information has been provided. These concerns include community liaison, employment of local workers during and after construction, and the creation of a compensation fund. In the case of community liaison, action should begin immediately.

Approval and supervision procedures for the 1982 construction program are discussed in Section 3.6.

3.6 Responsibility for Mitigation Measures and Monitoring

The responsibility to ensure necessary measures are implemented during the design and construction phases requires a number of agencies to communicate and co-operate effectively if the impact of the project is to be minimized.

The Canadian Transport Commission has established a Working Committee to ensure the conditions contained in their decision approving the project are followed. In a brief to the Panel a Canadian Transport Commission representative noted it would be likely that, if Parks Canada and CP Rail had previously reached agreements on requirements, the role of the Committee would be one of routine monitoring and dispute resolution.

CP Rail proposed an Environmental Steering Committee to which a design team and an implementation team would report. An Environmental Protection and Reclamation Co-ordinator would be hired by CP Rail. Under this proposal the committees and teams would have Canadian Transport Commission, Parks Canada and CP Rail membership. The Panel believes that the Committee proposed by CP Rail requires modification.

The Panel has concluded that a Committee concentrating on environmental issues is required if the problems mentioned by several intervenors are to be avoided. For this reason persons of appropriate expertise should be on the Committee wherever possible. Environment Canada has a responsibility for providing advice and the Environmental Protection Service should be part of an Environmental Committee that would provide the mechanism for on-going consultation between Parks Canada and CP Rail. In addition to a member from each of these three parties, others should also be invited to participate if and when appropriate.

The role of the Environmental Committee would be to:

1. Ensure that the conditions established by the Panel are adhered to and that further studies are carried out as recommended.
2. Approve environmental aspects of plans and specifications in accordance with Panel recommendations and Parks Canada's responsibilities.

3. Ensure that the commitments made by the proponent in the IEE and other documents and stated during public meetings are followed.
4. Establish detailed monitoring plans.
5. Ensure the provision of information to the public.
6. Seek policy guidance from designated senior personnel when policy matters require resolution.
7. Provide direction to an Environmental Co-ordinator.
8. Resolve environmental construction problems that cannot be solved by the Environmental Co-ordinator.
9. Ensure that contractors receive briefings on environmental requirements prior to and during construction
10. Ensure that avalanche safety precautions are implemented.

The role of the Environmental Co-ordinator would be to serve as the day-to-day contact for Park Wardens and other inspectors and ensure that construction operations are carried out by the contractors, using good environmental practices and in accordance with the agreements reached by the Committee. The Environmental Co-ordinator should regularly submit reports to the Committee on matters related to the degree to which environmental requirements are being met during construction operations. If environmental standards and practices are not being followed the Environmental Co-ordinator should have the authority to make on-site decisions.

The Panel believes there is a definite need for regular on-site meetings with the contractor(s) if environmental problems are to be avoided. Weekly meetings should include CP Rail's project representative, Parks Canada staff and the Environmental Co-ordinator as well as others such as Canadian Transport Commission staff or CP Rail's consultants where appropriate.

The Panel concludes that it is essential that the Committee members and the Environmental Co-ordinator be designated and working prior to construction.

4. SUMMARY OF MAJOR RECOMMENDATIONS

The Panel's conclusions and detailed recommendations are outlined in section 3. The Panel's major recommendations are summarized as follows:

1. Construction of the east and west portals be allowed to commence in 1982. Additional study is required prior to further tunnel construction.
2. Further study should be carried out on an alternative location for the ventilation stack as the original location is considered unacceptable in a National Park setting.
3. Further studies on terrain impact and development of a detailed reclamation plan are required prior to construction of the proposed 30 m right-of-way. However, clearing for an access road along the surface grade can proceed in 1982 provided it is generally limited to 15 m, detailed plans are reviewed and strict supervision is imposed.
4. A work camp for the portal construction crews be permitted at the Beaver site subject to prior provi-

sion of adequate precautions and approved design.

5. An Environmental Committee be established and an Environmental Co-ordinator be on-site prior to any construction. The Committee would consist of representatives from the Environmental Protection Service of Environment Canada, Parks Canada and CP Rail with the Environmental Co-ordinator reporting to the Committee. The role of the Committee is outlined in section 3.6 and would include approval of detailed plans. The responsibilities of the Environmental Co-ordinator are also provided in section 3.6 and include supervision of construction activities.
6. No construction activities, other than those found acceptable in this report for the 1982 construction program, should be permitted until the further studies requested have been submitted by CP Rail and reviewed by the Panel.

ROGERS PASS

ENVIRONMENTAL ASSESSMENT PANEL

A handwritten signature in black ink, reading "P. J. Paradine". The script is fluid and cursive, with the first letters of each word being capitalized and prominent.

P. J. Paradine
(Chairman)

A handwritten signature in black ink, reading "W.A. Ross". The signature is written in a cursive style with a large, stylized "W" and "A".

W.A. Ross

A handwritten signature in black ink, reading "G.D. Tench". The signature is written in a cursive style with a large, stylized "G" and "T".

G.D. Tench

APPENDIX I

TERMS OF REFERENCE FOR THE ROGERS PASS ENVIRONMENTAL ASSESSMENT PANEL ISSUED BY THE MINISTER OF THE ENVIRONMENT

Mandate

The Environmental Assessment Panel is to undertake a review of the environmental and related social impacts of the proposed Rogers Pass Development Project.

Scope of the Review

The Panel should examine the environmental and related social impacts of the project and of associated facilities within and affecting Glacier National Park. The proposal includes the construction of 18 km of new surface track, 16 km of tunnel and thirteen bridges. Two work camps with facilities for 250 men each are proposed within the park. The proposal also calls for the supply of electrical power to the tunnel.

Review Process

In recognition of the urgency associated with completing the environmental assessment review, and in order to avoid delaying the project, the procedures normally followed by Environmental Assessment Panels have been altered. The procedures to be used for this review include but are not necessarily limited to the following:

- 1) Preparation of a preliminary report to identify the activities which may be undertaken immediately and the issues of major concern which require further study;
- 2) Preparation of a final report to the Minister which will recommend the best way for the project to proceed in order that the effects on the environment can be minimized including such specific mitigative measures deemed necessary;
- 3) Convening of meetings by the Panel to receive public input prior to the preparation of its reports;
- 4) Existing and additional information requested by the Panel should be available to the public in order to allow the public to participate in the review;
- 5) The Panel shall publish detailed procedures on its plans for conducting the review.

APPENDIX II

BIOGRAPHY OF PANEL MEMBERS

MR. PHILIP J. PARADINE, CHAIRMAN

Mr. Paradine graduated with a B.Sc. (Civil Engineering) and later completed a M.Eng. (Water Resources) at the University of Ottawa.

He joined the Public Service of Canada in 1967 and held positions as a professional engineer with Transport Canada, the National Capital Commission and Environment Canada. Since 1973 he has specialized in environmental protection and assessment.

In 1978, Mr. Paradine joined the Federal Environmental Assessment Review Office (FEARO) and has been responsible for the administration of several Panel reviews, including the Banff Highway project (km O-13) and (km 13-27).

Since 1979 he has been chairing Panel reviews in the Atlantic area and is currently a Director of Panel Operations with FEARO.

DR. WILLIAM A. ROSS

Dr. Ross graduated with a B.Sc. Degree (Manitoba) and subsequently obtained a Ph.D. in Physics from Stanford in 1970.

After doing post-doctoral research work at McGill University, Dr. Ross joined the Faculty of Environmental Design, University of Calgary, in 1973.

Since that time he has been working extensively in the field of environmental science with particular interest in environmental management and energy conservation. He is currently Professor of Environmental Science and Associate Dean, Faculty of Environmental Design, University of Calgary.

He was a member of the Environmental Assessment Panel that reviewed the Banff Highway Project (km O-13) and (km 13-27).

Dr. Ross has lectured on various aspects of environmental sciences including environmental impact assessment. He has also directed environmental research and published numerous papers.

MR. GEORGE D. TENCH

Mr. Tench completed his degree in Architecture in Durham, England in 1951.

Mr. Tench was employed as an architect with the Department of Indian Affairs and the Department of Public Works in Ottawa, prior to 1956 when he moved to the Edmonton district office of Public Works. He transferred to Vancouver in 1957, was appointed Regional Architect for Public Works in 1966 and Regional Manager, Design and Construction, in 1972. In this capacity, Mr. Tench was responsible for DPW's Marine, Building and Highway programs in British Columbia and Yukon. He served as a member of the Shikwaka Highway Environmental Assessment Panel which completed its review in 1978.

He retired from DPW in December 1980 and is now consulting in the construction field.

APPENDIX III

LIST OF PARTICIPANTS

K. Adam-Panel independent expert-Interdisciplinary Systems Ltd.
V. Baugh-Commander-RCMP Golden detachment
G. Beckstead, Hydrocon Engineering, Calgary
A. Boruck-Revelstoke
G. Buck-CP Rail consultant-Thurber Consultants
R. Charwood-Panel independent expert-Klohn Leonoff
D. Crandall-Golden
B. Dean-Revelstoke
F. Demmon-Alderman, Town of Golden
R. Dolman-Regional District of Columbia-Shuswap, Economic Development Commission
J. Doyle-Mayor, Town of Golden
J. Dunster-Golden
D. Faulkner-Atmospheric Environment/DOE
J. Foster-CP Rail consultant-MacLaren Plansearch
J. Fox-CP Rail (Proponent)
R. Gallicano-Alderman, City of Revelstoke
M. Graham-CP Police department
P. Griffiths-B.C. Speological Federation
L. Gyug-Canadian Wildlife Service/ DOE
R. Hamilton-Parks Canada/ DOE
L. Hardstaff-Revelstoke
S. Herrero-National and Provincial Parks Association of Canada (NPPAC), Calgary
L. Hurwitz-Panel independent expert-Interdisciplinary Systems Ltd.
T. Jandali-CP Rail consultant-Environmental Sciences Ltd.
H. Kariel-Sierra Club of Western Canada, Calgary
D. Kennedy-Panel independent expert-Harford, Kennedy, Wakefield, Ltd.
M. Klassen-CP Rail (Proponent)
M. Knight-Golden
E. Langshaw-Field, B.C.
L. Lawrence-Rogers Pass Resident
B. Leeson-Parks Canada/DOE (Initiator)
B. Levelton-Panel independent expert-B. H. Levelton and Associates
S. Levy-CP Rail consultant—Parson, Brinckerhoff, Quade and Douglas Inc.
Mr. Maltby-Revelstoke
B. Martinson-Revelstoke
W. McCrory—Valhalla Wilderness Society
Mr. McNab-Alpine Club of Canada, Vancouver
D. Moore-United Transportation Union
J. Morris-Golden
S. Pilkington-Vancouver
D. Polster-CP Rail consultant-Norecol Environmental Consultants
M. Posey-Federation of Alberta Naturalists, Calgary
G. Robson-Northlander Motor Lodges Ltd.
P. Schaerer-Panel independent expert, NRC-BC regional station

C. Schiesser-Big Bend Resource Society
F. Schleiss-Parks Canada/ DOE
Y. Shoji—Revelstoke Economic Development Committee
K. Sky-National and Provincial Parks Association of Canada (NPPAC), Vancouver
J. Soul-Glacier Park Lodge, Rogers Pass
K. Tikkanen-CTC, Saskatoon
J. Turn bull-Parks Canada/ DOE
R. van Drielen-Big Bend Resource Society and Golden Public Advisory Committee
D. Vanwieren—B.C. Motels, Resorts and Trailer Parks Association
M. Wakely-CP Rail (Proponent)
G. Wilkie-Bow Valley Naturalists, Banff

APPENDIX IV

BIBLIOGRAPHY

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- Review of Noise Aspects of the Initial Environmental Evaluation for the CP Rail Grade Improvement Project, Rogers to Cougar Creek, April 12, 1982 (Harford, Kennedy, Wakefield Ltd., Acoustical Consultants) prepared for the Rogers Pass Environmental Assessment Panel.
- CP Rail Rogers Pass Grade Improvements—Comments Related to Terrain and Hydrology Impacts and 1982 Construction Activities, April 16, 1982 (Interdisciplinary Systems Ltd.) prepared for the Rogers Pass Environmental Assessment Panel.
- Impact on Avalanche Safety of Proposed Rail Line and Tunnel at Rogers Pass, April 5, 1982 (Peter Schaerer, NRC, B.C. Regional Station) prepared for the Rogers Pass Environmental Assessment Panel.
- Review of Rogers Pass Tunnel Ventilation System Concepts Proposed by CP Rail-Supplementary Brief-April 15, 1982 (Klohn Leonoff Ltd.) prepared for Rogers Pass Environmental Assessment Panel.
- A Review of Environmental Evaluation Studies CP Rail Grade Improvements in Rogers Pass—Supplementary Brief-April 15, 1982 (B.H. Levelton and Associates Ltd.) prepared for Rogers Pass Environmental Assessment Panel.
- Compendium of Written Submissions and Briefs Submitted to the Panel Before and During the Public Meetings on the Rogers Pass Project, April 1982, prepared by the Panel Secretariat.
- Transcripts of Public Meetings held in Vancouver April 13, 1982, Revelstoke April 14, 1982, Golden April 15, 1982 and Calgary April 16, 1982.

APPENDIX V

ACKNOWLEDGEMENTS

The Panel would like to thank all those who participated in this review, and in particular the following individuals:

Mr. Guy Riverin, Panel Secretary,
Mr. R. Connelly,
Mrs. S. Latour,
Mrs. G. Crites, and
Mrs. C. Boivin