

**ENVIRONMENTAL EFFECTS OF A MINING ROAD  
THROUGH THE TRADITIONAL TERRITORY  
OF THE TAKU RIVER TLINGIT FIRST NATION:  
A Critique of Proposed Management Plans for a New Mining Road  
Report to the Taku River Tlingit First Nation  
By the Independent Science Panel  
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**EXECUTIVE SUMMARY**

This is the report of a panel of scientists convened to respond to concerns about potential environmental effects of a 160 km industrial access road proposed and to be built by Redfern Resources through the currently unroaded traditional territory of the Taku River Tlingit First Nation in northwest British Columbia. This report comments in particular on mitigation measures proposed in Redfern’s “Adaptive Management Plan.” Without the agreement of the Tlingits, the provincial government of British Columbia has issued a project approval certificate to allow Redfern to build this road to access its Tulsequah Chief mine. However, the federal government of Canada is continuing to review the project application.

The Tlingits requested that an expert panel of scientists meet to review Redfern’s Adaptive Management Plan. They asked for an independent, objective, scientifically sound review whose results will be made available to federal authorities currently conducting an environmental screening of the project under the Canadian Environmental Assessment Act. The members of the Independent Panel agreed to serve only on the condition that their work be completely in-

dependent of opinions, pressures, convictions, or beliefs of any outside party or interest. This document is the Panel’s report. Its major observations are as follows:

! The Taku River Tlingit traditional territory is an important area representative of rich northern ecosystems supporting critical transboundary wildlife populations, some of which are nationally significant and genetically unique. These ecosystems sustain the subsistence economy and are essential to the cultural needs of the Taku River Tlingits.

! The Taku River Tlingit traditional territory is one of the largest remaining roadless areas in North America and is especially important because it is representative of the boreal forests and northern coastal ecosystems and of those regions’ wildlife, including many rare, threatened, and endangered species. Some of these are critical transboundary wildlife populations; others are genetically unique. As such, the territory represents a global ecological resource.

! Redfern’s Adaptive Management Plan will not prevent ecologically unacceptable effects. The plan is deficient in approach and in proposed implementation. The link between monitoring and mitigation is unsound, and the mitiga-

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tion recommendations are either uncertain or ineffective.

! Redfern's acknowledgment that its Adaptive Management Plan is a largely conceptual "starting point" is a concern for the Panel because the details necessary to fully evaluate the scientific merit of the monitoring and mitigation are mostly lacking.

! Redfern's plan reduces complex dynamics of ecological systems, and the management problems these pose, to statements about locked gates and limited offers to modify road-building activities. In a situation that calls for monitoring a variety of factors before, during, and after building and using the road, it offers limited observations of a few wildlife species over a short time.

! Redfern's plan appears to rely on opportunistic sightings of wildlife along the road to monitor changes in abundance and distribution and trigger intensified mitigation. This is a statistically biased sampling method. Failure to use a statistically reliable sampling design lowers the likelihood of detecting changes in distribution.

! The plan is also deficient in failing to list what factors are to be monitored. Failure to monitor necessary environmental variables will make it impossible to distinguish the effects of Redfern's activities from other causes of change in the environment.

! What is called a "road" will actually be a highway in terms of the construction standards required. For many kilometers, it will be built on steep slopes, where it will alter the land for 60 or more meters' width. It requires many culverts, bridges, and ditches, and all of these require maintenance. The estimated traffic — one large and heavy ore-bearing truck every two hours plus a returning empty ore truck every two hours and an estimated 22 additional vehicles a day — is considerable and not characteristic of a typical rural road, nor to be confused with a small "road" in what is now a wilderness.

! The ecologically unacceptable effects of the road include potential direct effects on wildlife populations and their habitats, on transboundary species, and on species designated under Canada's Species at Risk Act, in particular the griz-

zly bear and the two transboundary ungulates important as food and for cultural reasons to the Taku River Tlingits: caribou and moose.

! Redfern's Adaptive Management Plan and all other project documents reviewed by the Panel provide no economic, social, or cultural metrics for accurately evaluating impacts on the Taku River Tlingits and stakeholders, nor has an adequate process been articulated that will provide these metrics. Thus the plan is deficient in ways to measure these effects.

! The Redfern plan calls for eventual decommissioning of the road. However, our experience leads us to believe that this road will never be fully or properly decommissioned. The low likelihood of road decommissioning further undermines the use of the term *adaptive management*; the main action (the road) cannot be substantially altered in response to observations of negative environmental and/or sociocultural impacts.

! In addition, once the road is in place, any other entity — individual or corporation — that has a legal right to some resource accessible from the road has a legal right under Canadian British Columbian law to use the road. Such use will not necessarily be subject to the constraints agreed to by the Redfern Corporation. Thus, the creation of the road represents an opening up of the land to a variety of uses, which, individually and together, will significantly affect the Taku River Tlingit First Nation culture. Effects from these secondary uses likely will be additive to those created by implementation of the plan.

## **INTRODUCTION: THE SCOPE AND FRAMEWORK OF THE PANEL'S TASK**

Without the agreement of the Taku River Tlingit First Nation (TRTFN), the provincial government of British Columbia has issued a permit allowing the Redfern Corporation to build a 160 km industrial access road through currently unroaded TRTFN land in northwest British Columbia. The permit requires Redfern to "finalize a detailed plan for the construction and operational phases of the project." In the meantime, the Government of Canada is subjecting the project to a federal environmental assessment. The Independent Science Panel requested by the

Tlingit included experts in the construction of roads through forests and wilderness; the study and management of wildlife, including threatened and endangered wildlife; forestry; ecology; biogeography; land planning; adaptive management; environmental sustainability; ecological modeling; and statistical analysis. The members agreed to serve only on condition that their work be completely independent of opinions, pressures, convictions, or beliefs of any outside party or interest.

The Panel was provided with all major and many ancillary documents concerning the Redfern road proposal. Each Panel member reviewed these documents. The Panel met in Vancouver for two days, September 16–17, 2004, and has worked since by correspondence. The resulting report comments on mitigation measures proposed in Redfern Corporation’s “Adaptive Management Plan.”

### **The Panel’s Task**

The Tlingit asked us to consider the following questions, and we have structured the report around these questions:

**1.** Is Redfern’s Adaptive Management Plan for the road adequate to prevent adverse effects on moose, caribou, and other ungulate species on which the Tlingits depend, and which move across their territory? Specifically:

a. Based on current best knowledge, would the proposed access-control measures (i.e., locked and manned gates) effectively protect these wildlife populations from the proposed new highway through the territory?

b. Would the proposed monitoring program inform managers and regulators in a timely way about the effects of the road’s construction and operation on the ungulate populations?

c. Would the proposed adaptive management measures — including regulating traffic flow, and warnings to trucks about animal pres-

ence — be effective in protecting wildlife and the Tlingits from adverse effects of the new highway?

**2.** Could there be an alternative and more effective approach to creating new access to the territory while protecting the animal populations and the Tlingits’ land-based economy and culture?

The Panel’s scope of work was confined to the specific impacts of the proposed mining road that have consequences for the environment, natural resources, ecological systems, threatened and endangered species in the Tlingit traditional territory, and for the aboriginal peoples themselves. There are large ecological, environmental, economic, societal, and cultural issues that extend from the proposal to build this road, which the Panel acknowledges but which go beyond the scope of this report.

The panel evaluated Redfern’s plan from the point of view of good science and the proper application of science. The Panel also evaluated the plan in the context of the Canadian Environmental Assessment Act (hereafter referred to as “the Act”). Among the purposes of the Act are the promotion of sustainable development, protection against significant adverse environmental effects from any proposed physical activity, and the promotion of communication and cooperation between responsible authorities and aboriginal peoples.

The report provided by Redfern is called an “Adaptive Management Plan.” This term has become popular in environmental planning and environmental literature, and considerable technical literature has been devoted to it. As a result, there is a definite expectation among professionals involved with this topic of what an adaptive management plan will include. The Panel finds the Redfern Adaptive Management Plan deficient as this term is now conventionally used. We have included a detailed discussion of adaptive management plans in **Appendix I**.

**1A. BASED ON CURRENT BEST KNOWLEDGE, WOULD PROPOSED ACCESS CONTROL MEASURES PROTECT IMPORTANT WILDLIFE POPULATIONS FROM CONSTRUCTION AND USE OF THE NEW ROAD?**

**Control of Access to the Road**

The key mitigation upon which the AMP relies is the use of gates to control unauthorized access during the eight-year mine life, followed by deactivation of the road at the end of the mine life. The assumption here is that installing gates along the route will prevent unauthorized access to the territory, and that there will be no significant impacts to wildlife from the project. The proposed 160 km road begins at the north end by passing through an area with existing ungated access to the proposed roadway and adjacent lands. Redfern proposes adding a new section to the south that will have locked but unmanned gates at both ends. The road will pass through an already roaded area from Wilson Creek to O'Donnell River, where a manned gate will control access to the southern half of the road into an area that is ungated and unmanned, and then, farther south, into a second, manned gated area and then to the mine.

**CONCLUSION:** Panel members Frost and Demarchi, with a combined 80 years of public land-management experience, conclude that unmanned locked gates are difficult to control at best and completely uncontrollable at worst. The overriding experience is that hunters and others with a strong desire to get beyond such gates will succeed in doing so. Lawbreakers with ATVs and high-clearance four-wheel-drive vehicles are especially prone to disregard gates. It is impossible to control all access along all portions of a road simply through locked, unmanned gates, as proposed for much of the road.

It is also significant that the 160 km road will cross and conflict with First Nation historical trails many times. It is the panel's experience that access to these cannot be controlled by gates, signs, etc., and the crossings of, and access to, historical trails will adversely affect aboriginal cultural practices.

**Road Construction and Maintenance**

It is expected that the road's construction will be rapid and will involve simultaneous construction from three points: the north, south, and central portions of the road. Moving equipment to these points will likely cause damage to soils and water.

**Revegetation** of cut and fill slopes, particularly in the southern portion where the road crosses steep terrain, seems not to have been addressed, yet will be necessary to maintain and operate the road and minimize environmental damage, as vegetation retards erosion and has other beneficial effects. We note also that the mitigation recommendation of using plant species that will not attract wildlife is naive as virtually all species of plants adapted to this region are utilized by one species of wildlife or another.

**Erosion and road operation in winter:** Redfern foresees year-round operation of the road, but the Panel believes this is unlikely because of heavy winter snows at the south terminus of the road for about 15 km. Indeed, during spring breakup, portions of the entire route will become unstable and subject to serious erosion.

**CONCLUSION:** The proposed methods of road construction and maintenance appear to pose problems not adequately addressed in the Redfern report and appear inadequate to prevent adverse environmental effects.

**Road Deactivation/Decommissioning**

A condition of the project's approval by the government of British Columbia was that the road would be decommissioned and deactivated at the end of the mine's life. However, the Special Use Permit issued for the road provides for the potential transfer of ownership of the road to other parties, and thus leaves open the possibility that the road will never be closed.

The Panel looked at three aspects of road decommissioning: (1) whether the road *can* be effectively decommissioned; (2) the risk that other road users may emerge, making the road permanent; and (3) the financial risks of decommissioning the road.

**! What is the likelihood that the road will be effectively decommissioned?** *Effectively decommissioned* has two components: legal closure and functional closure (whether the legally closed road will actually still be used). Regarding the first, K. Diemert, a biologist at the British Columbia Ministry of Water, Land and Parks, stated that “while deactivation of roads is theoretically possible, experience shows that some motorized access will be available.”<sup>21</sup> Once again, the panel has a combined 80-plus years of experience with such matters.

**! Will other road users emerge, making the road a permanent requirement?** In a February 2004 letter, the Federal Minister of Fisheries and Oceans stated that “while Redfern offered to decommission the proposed road at the end of the mine life, the Province of British Columbia has been clear that other users could assume road responsibilities to perpetuate its use,” and that he “is unaware of any examples where substantial industrial access roads entering new territory were decommissioned and revegetated as a mitigation measure flowing from the environmental assessment (EA).”<sup>22</sup> In a similar situation in the Yukon, at the Cominco Kudz Ze Kayah mine, “The main issue is that the road has become a jumping-off place for other industrial activity. Other exploration companies have created a spur trail network that is defeating the initial purpose of limiting new access into the area.”<sup>23</sup> The Panel’s experience is consistent with these observations, and thus the Panel believes it is unlikely that the road will be functionally closed.

**! What are the financial risks of decommissioning the road?** The road’s financial risks include a substantial initial capital investment. Redfern’s initial pre-environmental-impact estimate was \$34 million for construction of the road, but given capital-cost increases, the actual cost could well be three to six times the original estimate. Although a mine previously operated in the same area, the new mining operation has no guarantee of financing the capital costs (mineral assays were being conducted from this summer’s exploratory drilling as this report was

being prepared). Because the entire project has significant financial risks, hauling of ore may not extend throughout the currently proposed eight-year mine life.

Road maintenance during winter and spring breakup will be especially difficult and costly, and these problems appear to be inadequately addressed in the Redfern report. There must be continuing care of bridges and drainage structures on active streams or catastrophic failures will occur. The large population of resident beaver increases the danger and probability of plugging of nonmaintained culverts.

A February 2004 letter from the Minister of Environment did not answer the question of what the minister would consider an adequate bond in the case of company bankruptcy or premature closure. This leaves the Panel in the dark as to whether the bond (\$3.5 million) would cover the full cost of road deactivation, or even be available if needed.

**CONCLUSION:** With respect to the first two issues, the Panel concludes that deactivation is not realistic once the 160 km road is constructed. Based on its combined 80 years of practical experience, the Panel believes that once the road is in place, it will be essentially impossible to stop ancillary development and its negative effects on transboundary wildlife and Tlingit cultural practices.

With respect to the financial issue, the Panel concludes that premature closure of the mine is possible given the financial risks, and that sound environmental management is possible only if adequate funds are put aside at the outset to deal with issues that will remain if the mine is closed prematurely. Otherwise the mine might be closed and the maintenance of the road could cease but undesirable environmental effects could continue. The concern here is twofold: There is no indication that when the time comes to deactivate the road, there will be sufficient funds available to (1) close the road and reclaim the road’s land, and (2) continue the enforcement to keep the road deactivated.

**1B. WOULD REDFERN’S MONITORING PLAN INFORM MANAGERS AND REGULATORS IN A TIMELY WAY OF EFFECTS ON UNGULATE POPULATIONS?**

*Redfern’s Adaptive Management Plan has essentially no details about monitoring methods and data analyses. Instead, the AMP is described as “a largely conceptual plan and a starting point”<sup>iv</sup> that will “integrate adequate monitoring and feedback mechanisms into the AMP to track the effectiveness of the program.”<sup>v</sup>*

There are several conventional types of monitoring: compliance; model verification; trend; and operations (see Table 1). Only operations monitoring appears in the plan. Model-verification monitoring appears to be unacknowledged in Redfern’s plan, and responsibility for trend monitoring appears to be largely transferred to the government of British Columbia.

**TABLE 1: Types of Monitoring**

a) <i>Compliance monitoring</i>	Provides information needed to determine whether activities are meeting permit or other regulatory requirements.
b) <i>Model verification monitoring</i>	Provides information to evaluate management alternatives or to determine whether the assumptions underlying predicted effects are valid.
c) <i>Trend monitoring</i>	Helps to identify long-term changes occurring as a result of human and natural factors.
d) <i>Operations monitoring</i>	Provides near-real-time data for use in adjusting project operations to help protect wildlife.

Past and proposed monitoring of wildlife, and the use of those data, are discussed in a report that the AXYS consulting company prepared for the Redfern Corporation, and the Panel has used that as the basis for its evaluation.<sup>vi</sup> The wildlife of special concern for the Tlingit aboriginal economy and culture are the grizzly bear and four large ungulates — mountain goat, Stone’s sheep, moose, and woodland caribou. Radio collars were placed on individuals of the four ungulate species to provide information about

the movements of wildlife during the year, and there was, in addition, one population estimate for each species.

**Caribou:** Caribou are of special importance to the TRTFN aboriginal culture. For this reason, there is a high degree of concern about conservation of this caribou population. As stated in the Ministry of Water, Land and Air Protection’s *Tulsequah Chief Project Fish and Wildlife Studies Annual Progress Reports: Year 2000:*

Caribou warrant the highest conservation concern within the Tulsequah Chief Project study area. This is primarily due to their low recruitment rates, their large-scale habitat requirements, their temporal shifts in habitat use and their difficulty as a species to recover once population numbers become low. Additionally, the proposed Tulsequah Chief mine road location intersects important caribou wintering areas in the lower Wilson Creek, O’Donnel River and Dixie Lake areas.

The Atlin East caribou herd is a special problem. Since the late 1970s, it has appeared to have a low recruitment of calves.<sup>vii</sup> As a result, the Tlingit have temporarily ceased hunting and the British Columbian licensed harvest by others is limited to 45 older bulls annually. According to representatives of the Taku River Tlingit First Nation, consistent with their aboriginal cultural practices, they would, if possible, take one caribou a year per family, or approximately 90 animals.

Thus, even if only the minimum desirable harvests were taken, 145 animals would be taken each year from a population estimated at approximately 650–1,000 animals (see below). For the caribou population to sustain itself at current levels, it would have to have an annual net recruitment (birth minus all other sources of death than hunting) of between approximately 15% and 22%, which has not been characteristic of this herd.

**CONCLUSION:** The Panel concludes that there is no apparent margin for error in estimates of herd size, production, mortality, or immigration and emigration as these dynamics relate to harvest. The Panel believes that sustainability of the current population is suspect and that any

additional effects on population dynamics will increase the probability of negative impacts on the population.

**Baseline Data on Caribou**

The prerequisite for successful monitoring is adequate baseline data — data obtained *before* the actions of concern are initiated. For baseline data, caribou were monitored with 20 radio collars, 5 of which used GPS and therefore allowed direct full-time monitoring of an animal’s location. There is uncertainty about the extent to which the GPS-collared caribou are representative of the herd as a whole given the small number of animals, the sex ratio of the sample, and the number of years over which the data were collected. More certainty could have been achieved if, for example, radio-collar locations from the 1999 census were used to validate the fall distribution. The Panel notes that the TRTFN has produced a map of caribou-critical areas based on long-term traditional knowledge of the herd, and these data were not used to define or validate the GPS data.

**TABLE 2: Baseline Surveys Completed to March 31, 2001**<sup>viii</sup>

Caribou Rut Survey Atlin-East	Oct-1999
Moose Atlin East	Feb-2000
Moose Atlin East Total	Feb-2000
Sheep Total Nakina	Feb-1999
Caribou Calf Survey Atlin-East	March-2000
Goats Total Silver Salmon South	March 2000
Caribou Calf Survey Atlin-East	June- 2000
Moose Calf Survey Atlin	June-2000
Caribou Calf Survey Atlin-East	Nov-2000
Sheep Total Count Nakina	Feb-2001
Moose Total Count Tulsequah	Feb-2001
Caribou Calf Survey Atlin-East	March-2001
Grizzly Bear radio-collars	May/June 2000
Grizzly Bear radio-collars	Sept 2000

With only one baseline estimate of the total caribou population (1999), population trends are uncertain (one cannot determine a trend from one data point), and there is no quantitative estimate of year-to-year variability, an essential component for developing reliable monitoring

designs for adaptive management plans and mitigating actions. And usually considerable time is required. According to a report by a biologist in the Ministry of Water, Land and Air Protection, “Five years is necessary to provide sufficient indexes to assess annual variation in movements, habitat use and productivity.”<sup>ix</sup> Even five years is a long time compared with the available data. Feasibility could be demonstrated only with at least five years of strong baseline data and statistical power analyses that demonstrate that biologically significant changes in population sizes could be detected within a short period.

Thus, a critical component of an adaptive management plan is absent (i.e., a reliable monitoring plan), and what data do exist strongly imply that prompt detection of population declines is not feasible with the proposed methods of monitoring.

**CONCLUSION:** The Panel concludes that the baseline data are inadequate to obtain a statistically reliable and significant forecast of key wildlife populations prior to road construction, as a basis for determining the effects of the road on the distribution and abundance of these species.

**Data from Monitoring**

Redfern’s Adaptive Management Plan states that “goat use of important valley-bottom habitats in late winter and spring in the Nakonake River valley *will be closely monitored* by the Environmental Monitor” (our italics). The italicized phrase tells us nothing about methodology. The Plan refers only to recording opportunistic sightings of caribou, mountain goats, moose, and grizzly bears along the road corridor, species that the Redfern plan considers “particularly vulnerable to the types of impacts associated with a new road and mine development.”<sup>x</sup>

It is unclear to the Panel that these are the only vulnerable species. While they are of particular interest to the Tlingit, they are not the only wildlife in the area. For example, we note the absence of monitoring for wolverine (nationally recognized as of Special Concern). Small mammals are less well known. It is conceivable, for instance, that species such as BC’s Red-Listed

tundra shrew *Sorex tundrensis* occurs within the study area. The suggestion (AMP 2004, page 4) that “specific management needs for other species will be identified and developed as the AMP evolves with the project” is inadequate. Monitoring designs should precede the project operation and be modified, if necessary, during the project.

Conventionally, monitoring plans should also identify the least-cost/simplest indicators and specify the required level of resolution. The Panel notes that indicators can be relatively low-cost — indicators such as the distribution of rubbing trees (grizzly bears), tracks, and scat/fecal pellet have all been successfully used elsewhere.

The available documents are not clear about what is and what will be established to provide the proper institutional capacity for monitoring and management of wildlife. We note that the ungulate monitoring plan for the British Columbia government states that the government will do the monitoring.

Given insufficient staff and resources for adequate monitoring within government, it should be a condition of any permit issued that the proponent be required to fund all of the monitoring associated with the project. However, the Panel believes that it is not scientifically adequate for the party with mining interests to do the monitoring and interpret the monitoring data. The Panel believes that this must be done by an independent body, which is not yet defined.

It is the Panel’s understanding that in this situation, caribou monitoring and harvest management are both the mandate and responsibility of the British Columbia government. However, it is not clear that under present funding, this government has adequate staff to carry out such monitoring. The Panel notes that there have been significant reductions in wildlife management staff and operational budgets in both Victoria headquarters and the Smithers Regional Office in the past few years. This suggests that institutional capacity for proper safeguarding of this population currently does not exist and is unlikely to be reestablished in the near term. Whoever actually carries out the field monitoring, the mandate and responsibility require that

an independent body review the field monitoring for adequacy of design, conduct, and results and maintain quality assurance over the life of the project, including the decommissioning, should it occur, and follow-up phases.

The Panel notes also that the AXYS 2004 report, in mapping the distribution of the herd, does not use all data available to determine the seasonal movements of the caribou in the region. Given the uncertainties already noted about the herd, it would be advisable to use as much of the data as possible.

**CONCLUSION:** The Panel concludes that the proposed monitoring is inadequate and as such will prevent mitigating actions from succeeding. The Panel concludes that an independent, non-governmental body should review the monitoring program design and conduct the monitoring and data analysis.

Under the present plan, the caribou population will be at high risk of extirpation within a relatively few years, and it is likely that other species of concern will also be placed at risk within the TRTFN traditional territory. Additional wildlife species may also be at risk and need to be monitored and considered.

### **1.C. WOULD REDFERN’S ADAPTIVE MANAGEMENT MEASURES BE EFFECTIVE IN PROTECTING WILDLIFE AND THE TLINGITS FROM ADVERSE EFFECTS OF THE NEW ACCESS?**

The other mitigating actions proposed in the adaptive management plan include traffic regulation; reporting of wildlife mortality and other observations by truck drivers; speed limits for trucks; two-way radios on the trucks; signs posted where there are critical wildlife areas; no salt-based agents for dust control; maintaining low snowbanks in winter; aerial survey of goats prior to avalanche control; delaying avalanche control until goats move one kilometer away from the control zone; removal of wildlife carcasses; road users required to conform to Redfern’s road-use policy and its firearms, hunting, fishing, and vehicle-use policy; implementation of a traffic-management policy; traffic monitoring and record keeping; and filing an annual adaptive management plan report.



## **Traffic Regulation**

Traffic on the road will be significant, with the corporation's one large and heavy ore-bearing truck every two hours, a returning empty one every two hours, and an estimated 22 additional vehicles a day.<sup>xi</sup> If most of these 22 other vehicles use the road during usual working hours, then during those hours traffic loading will be an additional three vehicles per hour.

The proposal requires two-way radios on all vehicles and location reporting every 5 km. However, in the experience of Panel members, radio communication and the dispatching of trucks and enforcement personnel are cumbersome procedures. Complex controls to regulate ore-truck traffic will be difficult to maintain, and access violations by unauthorized persons will be difficult to report and enforce.

**CONCLUSION:** All proposed adaptive management measures are of minor utility or none at all. They will not prevent ecologically unacceptable effects. The plan is deficient in approach and in proposed implementation. It is a largely conceptual starting point, and the details necessary to fully evaluate the scientific merit of the monitoring and mitigation are mostly lacking. The link between monitoring and mitigation is unsound, and the mitigation recommendations are either uncertain or ineffective.

## **2. IS THERE A BETTER WAY TO CREATE ACCESS TO THE MINE WHILE PROTECTING ANIMAL POPULATIONS AND THE TRTFN'S ECONOMY AND CULTURE?**

In the case of proposed access to the Tulsequah Chief mine site, the immediate goal is to access a single mine site. However, it is a reasonable expectation that a new road will greatly enhance opportunities for exploring various other development possibilities. In that sense, Redfern's road would serve as a road to resources, with transportation leading land use. Consequently, losses to environmental resources are essentially a cost of doing business, with some efforts to manage or mitigate adverse consequences.

An alternative approach (discussed in more detail in Appendix II) is to recognize the significance of transportation as a land-use force but to

start by first determining the broad elements of prospective land use, with particular emphasis on defining areas of highest resource-development potential; areas of highest conservation and heritage significance; and then the areas of overlap. With that as a broad framework, transportation options to maximize access to development areas and minimize impacts on conservation and heritage areas could be defined and evaluated. (Concurrently, conflicts between development and conservation goals would be examined and direction established on an area-by-area basis, using consistent criteria.)

The TRTFN has an understandable concern for economic security and the sustainability of wildlife resources. Accordingly they will want to see protective zoning or designations to help protect habitats. They will also want some assurance of proactive wildlife management and that they will have some meaningful voice and place in wildlife-management planning and decision making. Cooperative management agreements may have to be concluded with some identified links to overall land-use planning as well as to the treaty-making process. Similarly, the TRTFN will want to have some clear and direct way of participating in development projects as employees, contractors, or in management. Such arrangements have been described as Interim Benefit Agreements (IBAs).

For their part, in consideration of agreements as outlined above, companies and governments would want assurance of security for their investments of capital and effort. That would imply agreement on conditional development zones and on major access arrangements.

Side agreements on cooperative management, joint ventures, or benefit schemes would be reflected in overall land-use agreements (and in treaty agreements as appropriate).

This Panel, from its independent perspective and removed from particularities, considers that there may be scope to pursue cooperative solutions to the access issue. The first broad requirement would be willingness to explore regional planning, with a specific plan outcome being identification of acceptable access. The

second broad requirement would be the actual commitment of time, resources, and effort toward seeking agreement, especially on access routes and/or modes.

An agreement on land use seems unlikely unless it is complemented by parallel agreements on economic benefits and cooperative resource-management arrangements. Work on these arrangements should be concurrent with and linked to the regional planning process. The intent is to give all participating parties the security they require. The TRTFN requires enhanced security and control regarding their interests. Investors and government require security for development projects. The expectation is that collaborative planning would develop mutual understanding and a clear and formal framework that would make mutual security a reality.

The Panel believes that alternative approaches may be possible (these are discussed in Appendix II). Our report could be helpful in designing an alternative approach. The new plan would consider alternative ways to transport ore, as was considered in the early stages of Redfern's planning. It would also include work with the TRTFN, making use of both oral traditions and scientific observations to estimate such things as caribou population growth and maximum expected recruitment to the caribou herd.

Ways might also be found to boost the productivity of caribou, such as research to understand what is limiting population growth now, and to take measures as a result to improve habitats and perhaps add to the number of those habitats.

#### **CULTURAL AND ECONOMIC IMPACTS ON THE TRTFN**

Canadian federal law also requires consideration of the cultural impacts of land modification. In this section we consider the cultural impacts of the proposed road on the Taku River Tlingit First Nation.

The Taku River Tlingits hunt and trap wildlife and catch fish on their traditional territory. The harvesting of fish and wildlife and wild plants — that is, resource harvesting and traditional land use — are important parts of their current economy. Overall “income” within their economy has two different elements: cash from earnings and government programs; and food and materials from traditional land use and resource harvesting. Social scientists, in recognition that the food and material harvests are a form of income, term this type of organization a “mixed-economy.”

The Panel believes that any ancillary development along the road would have further negative effects on the Tlingit economy and culture. As Staples (1997) writes, “The lack of a road has served as a deterrent to development and has been the major safeguard of Tlingit traditional territory use and the resources they depend upon.”<sup>xii</sup>

#### **SUMMARY**

The Panel concludes that the development of the road as proposed in the Redfern report would have significant negative effects on the natural environment and on the aboriginal economy and culture of the TRTFN.

Redfern's Adaptive Management Plan will not prevent ecologically unacceptable effects. The plan reduces complex dynamics of ecological systems, and the management problems these pose, to statements about locked gates and limited offers to modify road-building activities. In a situation that calls for monitoring a variety of factors before, during, and after building and using the road, it offers limited observations of a few wildlife species over a short time. The plan is also deficient in failing to list what factors are to be monitored. Socioeconomic and cultural impacts do not appear to have been adequately mitigated within the meaning of the Canadian Environmental Assessment Act.

## NOTES

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<sup>i</sup> AXYS 2004 Report

<sup>ii</sup> Letter from Hon. Geoff Regan, Minister of Fisheries and Oceans to Ms. Nicole Lischewski, Society for Atlin's Sustainable Economic Initiatives." February 11, 2004.]

<sup>iii</sup> AXYS Consulting Company, 2002, Summary of Access Control Initiatives.

<sup>iv</sup> Adaptive Management Plan for the Protection for the Protection of Wildlife During the Construction, Operation, and Decommissioning of the Tulsequah Chief Mine Operation, AXYS Consulting Company, Sidney, BC, Canada, January, 2004 page 16

<sup>v</sup> AMP 2004 page 5

<sup>vi</sup> Adaptive Management Plan for the Protection for the Protection of Wildlife During the Construction, Operation, and Decommissioning of the Tulsequah Chief Mine Operation, AXYS Consulting Company, Sidney, BC, Canada, January, 2004

<sup>vii</sup> Diemert, K, 2001, *The Tulsequah Chief Project: Fish and Wildlife Studies, Annual Progress Report: Year 2000*" By, Ministry of Water, Lands, and Air Protection, Province of British Columbia

<sup>viii</sup> AMP appendix, Table 8

<sup>ix</sup> TULSEQUAH CHIEF PROJECT STUDY DESIGN FOR UNGULATES, February 2001 Submitted to: **Tulsequah Chief Project Committee**, Prepared by: Karen Diemert Sr. Environmental Assessment Biologist, Habitat Protection Skeena Region

<sup>x</sup> AMP 2004 page 4

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port Tulsequah Chief Mine Project: Ore Concentrate Transport Plan and Atlin Road Upgrade". Prepared by Department of Indian and Northern Development. March 12, 1998. Attached as Appendix 7, Appendices to Report and Recommendations of the Tulsequah Chief Project Committee with respect to a decision on a Project Approval Certificate by the Minister of Environment, Lands and Parks and the Minister of Energy and Mines and Minister Responsible for Northern Development. March 1998. Revised May 1998. Sec. 3.2 of this document notes that "Redfern plans 24 one-way truck trips each day for most of the year." The trip is 1000 km round trip from the mine site to Skagway Alaska, via Whitehorse. This same section notes that small vehicle traffic (service vehicles, crew changes, etc.) on the mine road will amount to an additional "22 vehicles per day."

<sup>xii</sup> Lindsay Staples and Nick Poushinsky, 1997, *Determining the Impact of the Tulsequah Chief Mine Project on the Traditional Land Use of the Taku River Tlingit First Nation*, A Report Prepared for Environmental Assessment Office of the Province of British Columbia, prepared by North West Resources Consulting Group, Box 5016, Whitehorse, Yukon, Canada, Y1A 4S2

<sup>xi</sup> Source for estimated road traffic is: "Screening Re-