List of Records #189

CEAA Screening - Supplemental Report

Redfern Resources Ltd.'s Proposed Tulsequah Chief Mine Project in Northwestern BC

Prepared by:

Fisheries and Oceans Canada

DFO	5300-10-005
TC	
Provincial (PAC)	MO1-02
HRTS Reference	00-HPAC-PA1-000-000237
FEAI	36077

Last revised: December 3, 2004

Fisheries and Oceans / Pêches et Océans

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FISHERIES AND OCEANS CANADA

1.0 PROJECT IDENTIFICATION

File Numbers:

DFO (NWPA)	5300-10-005
Provincial (Proj Approv. Cert.)	MO1-02
HRTS Reference	00-HPAC-PA1-000-000237
FEAI	36077
Proponent:	Redfern Resources Ltd. 760, 777 Hornby Street Vancouver, BC V6Z 1S4
Contact:	Terry Chandler
CEAA Trigger:	Section 35(2) of the *Fisheries Act* for an effluent disposal system Section 5(1) of the *Navigable Waters Protection Act* (NWPA) for bridge crossings of the Sloko and Upper Nakonake Rivers
Responsible Authority (RA):	Fisheries and Oceans Canada (DFO)
Other Responsible Authority (RA)	Transport Canada (TC), Navigable Waters Protection Division
Referral Received by DFO:	19 October, 2000
Federal EA Start Date:	19 October, 2000

2.0 PROJECT DESCRIPTION

2.1 Project Name

Tulsequah Chief Mine Project

2.2 Project Location

Mine Location: Tulsequah River valley, ~ 12 km upstream of confluence of Tulsequah and Taku Rivers, ~ 20 km upstream of the Canada/U.S. border, approx 120 km south of Atlin, British Columbia.

Latitude: 58°38'N Longitude: 133°33'W

Maps: Topo 104 K 12

Access Road Location: from Atlin, British Columbia extending ~160 km south, crossing several watercourses to the Tulsequah Chief minesite.

Maps: Topo 104 K 12, 13, 14; 104 N 3, 5, 6, 12

2.3 Project Review History

Redfern Resources Ltd. proposes to reactivate the Tulsequah Chief mine which has been closed since the late 1950s. Mine reactivation includes construction of mine infrastructure, construction of an access road, operation of the mine and project deactivation.

The following mine site infrastructure is proposed to service an expansion of the existing underground workings: camp, processing plant, water treatment facilities, airstrip, tailings pipeline, tailings storage pond, effluent discharge system, neutral waste rock and temporary waste rock storage facilities, limestone quarry, and mine site road network.

To gain access to the site, Redfern Resources Ltd. is proposing to construct a ~160 km access road from Atlin, B.C. The proposed route crosses through the O'Donnel, Silver Salmon, Sloko, Nakonake, and Shazah watersheds.

Operation of the copper/gold/silver/lead/zinc mine is proposed for at least 9 years. Proposed mine rate is 2500 tonnes per day.

A joint federal-provincial review of the Redfern's proposal to reactivate the Tulsequah Chief mine was completed in 1998. The 1998 federal-provincial review was completed to fulfill the provincial requirements as well as the requirements of a screening level environmental assessment (EA) pursuant to the Canadian Environmental Assessment Act. The 1998 report stated that all the issues raised regarding the Tulsequah Chief Mine project were addressed and could be mitigated by the proponent and the Provincial Government.

2.4 Project Summary

In 2000, subsequent to the release of the 1998 harmonized environmental assessment report, and the issuance of a BC Provincial Special Use Permit, DFO was informed that Redfern had redesigned portions of its proposed access road to Atlin.

Particularly, changes in the proposed access road routing of a 17-km section from ~km 45 to km 62 from the south side of the Nakonake River to its north side were identified with new bridges requiring section 5(1) *Navigable Waters Protection Act* (NWPA) approvals. DFO also determined that additional section 35(2) *Fisheries Act* requirements, identified for a new mine effluent discharge system proposed to be buried within the Tulsequah River, were to be included in the CEAA screening. Based on these factors, DFO determined that a CEAA supplemental screening review was required.

Also subsequent to the 1998 review, the proponent and Provincial Government conducted a series of studies on fish and wildlife and developed plans to mitigate effects of the project. These new studies and plans were also included in the supplemental screening review.

This screening ammendment was initiated in 2000, and is supplemental to the 1998 harmonized EA report that satisfied CEAA EA requirements for the Tulsequah Chief Mine project.

2.5 Project Documents

The documents that were reviewed and considered in completing this CEAA supplemental screening report are as follows:

- "Tulsaequah Chief Copper/Gold/Silver/Lead/Zinc Project, Redfern Resources Ltd., Report and Recommendations by 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 the Minister Responsible for Northern Development; and, Fulfilling the Requirements of a Screening Report Pursuant to the *Canadian Environmental Assessment Act*." Prepared by the Province of British Columbia (BC), 1998. (The 1998 harmonized EA report)
- "Response to American Concerns" prepared by B.C. Environmental Assessment Office in May 1998.
- Lower Nakonake River Alignment Options Analysis – Tulsequah Chief Project Access Road (final version - Gartner Lee Limited, Nov. 1999) (list of records #77)
- Proposed Tulsequah Chief Mine Access Road – Follow-Up Geotechnical Assessments – Final Report (Bruce Geotechnical Consultants Inc, October 1999)
- Comments on Route Alternatives: Tulsequah Chief Mine Access Road Special Use Permit (SUP) Application. (Taku River Tlingit First Nation (TRTFN) - submitted to Ministry of Forests May 2000)
- Report of Tony Pearse – Respecting the Environmental Assessment and Approval of the Tulsequah Chief mine re-opening project (Feb. 1999) (list of records #108)
- Barichello: *Evaluation of Rescan's Wildlife Sections of the Environmental Assessment for the Proposed Tulsequah Chief Mine*. Normal Barichello. Prepared for Northwest Institute for Bioregional Studies, October 1997.
- Dewhirst: *An Aboriginal Cultural and Sustenance Impact Assessment of the Tulsequah Chief Mine Project, Northwestern British Columbia*. John Dewhirst and Tamara Little. Prepared for Redfern Resources. August 1996.
- Farnell: Review *of Tulsequah Chief Project Environmetnal Asessment Studies.* Rick Farnell. Prepared for TRTFN, February 1999.
- Hayes: *An Evaluation of Current Study Design and Wildlife Information for the Proposed Tulsequah Chief Mining Project*. Robert Hayes. January 2001.
- Pacquet: *Stone's Sheep of the Northern Rockies: The Effects of Access*. By M.M. Paquet and R. A. Demarchi. March 1999.
- Siderius: *Tulsequah Chief Project Review*. Joanne Siderius. Prepared for TRTFN. November 1997.
- Staples Addendum: *Determining the Impact of the Tulsequah Chief Mine Projecdt on the Traditional Land Use of the Taku River TLingit First Nation – Addendum on Impacts*. Lindsay Staples. Prepared for B.C. Environmental Assessment Office. December 1997.
- Staples and Poushinsky: *Determining the Impact of the Tuslequah Chief Mine Porject on the Traditional Land Use of the Taku River Tlingit First Nation*.

Lindsay Staples and Nick Poushinsky. Prepared for B.C. Environmental Assessment Office, August 1997.

- Affidavit of Rick Farnell (Feb. 1999) (list of records #107)
- Affidavit of David Shackleton (Feb. 1999) (list of records #111)
- Affidavit of Francois Messier (Feb. 1999) (list of records #110)
- Affidavid of Douglas Hudson (Feb. 1999) (list of records #99)
- Affidavid of Brian Horesji (Feb. 1999) (list of records #112)
- Tulsequah Chief Project – Economic Analysis (T. Bartek, Feb 2000) (list of records #130)
- A review of the Cumulative Effects Assessment Report – Tuslequah Chief Project (J. Green, R. Eccles and W. Klassen; Draft 6 – March 2001) (list of records #99)
- Cumulative Effects Assessment Framework for the Tulsequah Chief Project (AXYS Environmental Consulting Ltd. and W. J. Klassen, April 2001) (list of records #97)
- Task 1: Tulsequah River Salmon Habitat Cooperative Project – Transboundary Watershed Cooperative Project (Draft Sept 7, 2000)
- Alternative Route Options Tulsequah Chief Mine Access (Ministry of Forests, November 2001)
- A Sustainability Assessment of the Tulsequah Chief Mine and Road Proposal Using the Hodge Sustainability Lens. for Transboundary Watershed Alliance, D. MacKinnon, (Jan 2001)
- Mining and Sustainability: The Case of the Tulsequah Chief Mine – Interim Report, for Environmental Mining Council of B.C. T.L. Green (March 2001).
- Wildlife Impact Assessment Matrices (Diemert and Hamilton 2002). [These tables are included as Appendix A of Potential Wildlife Conflict Areas and Risks Associated with the Tulsequah Chief Mine Project (AXYS, June 2004), and referenced in TRTFN report as Ministry of Water Lands and Parks (MWLAP) 2004].

Based on the above information and public comments received subsequent to the 1998 review, DFO, in consultation with four other federal agencies, (Environment Canada, Canadian Wildlife Service, Parks and Heritage Canada, Indian and Northern Affairs Canada), the State of Alaska and TRTFN, compiled a list of 115 questions pertaining to the project. While some of the issues raised were a result of changes to the proposal, such as the effluent treatment system, the majority of the issues were discussed and an approach to address them was identified in 1998. However, in the reconvended assessment, new information required confirmation that the previous approach was still valid. For example, the anaysis of the wildlife information for the most part reconfirmed the same issues that were known in the 1998 review while providing more detailed conclusions on areas and timing of impacts

In April 2004, DFO received a response to the questions from Redfern and the following documents, prepared or commissioned by Redfern and the British

Columbia government to address the 115 questions, were considered in completing this CEAA supplemental screening report:

- Outstanding Issues Regarding Proposed Tulsequah Chief Project – letter from T. Chandler, Redfern Resources Ltd., to H. Klassen, DFO, (23 April 2004) and its appendices, notably:
    - Appendix 4: Tulsequah and Taku Rivers Mass Balance Water Quality Report (J. Lough and I. Sharpe, Nov 2003)
    - Appendix 5: Adaptive Management Plan for the Protection of Wildlife During the Construction, Operation and Decommissioning of the Tulsequah Chief Mine Project (AXYS Environmental Consulting Ltd., draft January 2004)
    - Appendix 6: Special Use Permit issued 21 May 1999 by B.C. Ministry of Forests
- Letter G. Macatee, Deputy Minister, Water, Land and Air Protection, to P. Macgillivray, A/Regional Director General, DFO (4 May 2004), containing provincial "signoff" of Redfern's April 2004 response and their Adaptive Management Plan.
- "Potential Wildlife Conflict Areas and Risks Associated with the Tulsequah Chief Mine Project" (AXYS Environmental Consulting Ltd., June 2004)
- Shazah Creek Fan Hazard Assessment (BGC Engineering Inc., July 2004)

DFO invited comment on Redfern Resource's 2004 response to the 2002 list of 115 questions from various reviewers and the following were received and considered in the preparation of this screening report:

- Letter S. Sheehan, Environment Canada, to H. Klassen, DFO (15 June 2004) with attached advice on water quality issues #1-7.
- Letter S. Sheehan, Environment Canada, to H. Klassen, DFO (8 July 2004) with attached advice on water quality mass balance issue #14.
- Letter J. Balsiger, U.S. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, to H. Klassen, DFO (16 June 2004) with advice on aquatic issues.
- Letter J. Koser, Yukon Fish and Wildlife Management Board, to Hon. B. Barisoff, Minister, Water, Land and Air Protection (22 June 2004) regarding detailed management plans for caribou.
- Letter B. Halstead, United States Department of the Interior (USDI), Fish and Wildlife Service, to H. Klassen, DFO (6 July 2004) regarding aquatics issues
- Letter Wm. Riley, US Environmental Protection Agency, to H. Klassen, DFO (8 July 2004) regarding aquatic issues.
- Letter N. Lischewski, Society for Atlin's Sustainable Economic Initiatives, to H. Klassen (8 July 2004) regarding aquatic, terrestrial, and accidents and malfunctions issues.
- Letter D. Dobyns, Douglas Indian Association, to H. Klassen, DFO (8 July 2004) regarding aquatic issues.

- Letter E. Fogels, State of Alaska Department of Natural Resources, to H. Klassen, DFO (14 July 2004)
- Letter D. MacKinnon, Transboundary Watershed Alliance, to H. Klassen, DFO (14 July 2004).
- Letter A. Crook, Center for Science in Public Participation, to H. Klassen, DFO (15 July 2004).
- Email L. Jackson, Natural Resources Canada, to H. Klassen, DFO (22 July 2004).
- Letter T. Pearse, T.D. Pearse Resource Consulting on behalf of Taku River Tlingit First Nation, to H. Klassen, DFO (14 August 2004) and attached report *Outstanding Issues, Tulsequah Chief Project* (August 2004).
- Letter M. Raillard, Canadian Wildlife Service, Environment Canada, to H. Klassen, DFO (24 August 2004).
- Letter M. Raillard, Canadian Wildlife Service, Environment Canada, to H. Klassen, DFO (3 September 2004).
- Letter P. Kluckner, Canadian Wildlife Service, Environment Canada to S. Farlinger, DFO (1 December 2004).
- Email P. Kluckner, Canadian Wildlife Service, Environment Canada to S. Farlinger, DFO (2 December 2004).

3.0 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

3.1 Scope of Project

As a responsible authority (RA) under CEAA, DFO is responsible for determining the scope of project for which an EA is to be conducted.

For purposes of this screening report, DFO has determined that the scope of the project (the Project) will include the project as scoped in the original 1998 harmonized screening report as well as changes in the project design or changes in information since the 1998 report. Information in the 1998 CEAA screening report was used to review those aspects of the project that did not change.

Therefore, building on the harmonized review concluded in 1998 where it was determined that the project was not likely to result in any significant environmental effects, this CEAA supplemental screening review addresses those aspects of the proposed mine infrastructure which have changed, undergone redesign or for which there is new information and includes: tailings storage facility, effluent discharge system, maintenance of mine infrastructure, the operation of the airstrip post-closure and the constructin of an access road.

Insofar as the access road is concerned and for the purpose of this supplemental screening report, while the scope of the project includes the 160 km long private industrial road from the minesite to Atlin, (which was addressed in the 1998 CEAA review), this supplemental screening report relied on the 1998 report and completed a detailed review limited to changes and redesign (i.e. five sections totalling 17 km) of the road.

As per CEAA Section 15(3), the decommissioning and abandonment will be considered as part of the EA.

3.2 Scope of Factors to be Considered

Pursuant to Sections 16(1) and 16(3) of CEAA, DFO determined the scope of the factors to be considered in the assessment as follows:

- Environmental effects of the Project including effects of accidents or malfunctions during construction and operation of the tailings storage facility, effluent discharge system, mine infrastructure and access road;
- Cumulative effects to the environment likely to result from the Project in combination with other projects or activities that have been or will be carried out;
- The significance of the environmental effects including cumulative effects;
- Comments received from the public; and
- Measures to mitigate adverse effects.

The spacial boundary of the environmental assessment is the area and valued ecosystem components (VECs) that are directly affected by components of the Project. DFO has determined the spacial boundary of the assessment to be the Tulsequah River valley, ~ 12 km upstream of confluence of Tulsequah and Taku Rivers, ~ 20 km upstream of the Canada/U.S. border, approx 120 km south of Atlin, British Columbia, and access road right of way from Atlin, British Columbia extending ~160 km south.

It is anticipated that there will be three aspects to the temporal boundaries of the assessment: effects arising during the construction of the Project, effects occurring during the operation and maintenance of the Project, and effects occurring during the decommissioning of the Project. The operation and maintenance of the Project is expected to last 9 years after which decommissioning will take place.

In determining the factors to be considered in the EA, DFO focused the assessment on those components of the environment most likely to be affected by the Project as proposed. To identify the factors to be assessed, DFO submitted the list of 115 questions to Redfern Resources Ltd. These questions and the subsequent response to them from Redfern form the basis of the factors to be considered. The factors are characterized as effects of the project on the environment, socio-economic conditions, physical and cultural heritage and any change to the project that may be caused by the environment. Based on these factors the questions are condensed into following common themes:

- Fish and aquatic habitat
    - Harmful alteration, disruption or destruction of aquatic habitat in the watershed
    - Impacts to the fisheries resource and to known species
- Water resources
    - Impacts on surface water quality
    - Impacts to navigation

- Environmental effects resulting from spills and malfunctions during the construction, operation and maintenance of the Project

- Human issues
  - Effects on human health
  - Effects on any structure, site or thing that is of historical, archaeological, palaeontological or architectural significance
- First Nations
  - Effects on current use of lands and resources for traditional purposes by aboriginal persons
- Terrestrial wildlife habitat
  - Habitat diversity, corridors, migration routes, habitat fragmentation
- Species at risk
  - Incidental harm to a species at risk or its critical habitat

Pursuant to 16(1)(e), DFO also considered looking at alternative routes for the access road. A modified Warm Bay route option that would avoid impacts to the Blue Canyon area was considered in a review of alternative access road routes that was commissioned by the Ministry of Forests (MOF). However, the MOF report concluded that alternates to Redfern's preferred route did not provide any significant benefits. Owing to high costs for public highway upgrades the Warm Bay route was eliminated from further consideration.

Most of the environmental effects of the Project were already examined in the initial harmonized review that concluded in 1998. The scope of factors to be assessed in this CEAA supplemental screening review focuses on those environmental effects that would be caused by subsequent changes to the project, components that were redesigned, and those brought to light with new information and analyses gained subsequent to the 1998 report.

4.0 CONSULTATION

4.1 Expert Federal Authorities

At the time this supplemental review was initiated in 2000, DFO was identified as a Responsible Authority (RA) pursuant to CEAA due to the requirement for approvals under the *Fisheries Act* and the *Navigable Waters Protection Act* (NWPA). The responsibility for the administration of the NWPA was transferred from DFO to Transport Canada. DFO continued the CEAA assessment to its completion with input from TC in its role as an RA with respect to permits required under the NWPA.

Under CEAA subsection 12(3), DFO requested the following Federal Authorities (FAs) in posession of specialist or expert information or knowledge relevant to the

factors to be considered in the assessment to provide their information or knowledge for use in the conduct of this EA:

Environment Canada, Environmental Protection Service

Environment Canada, Canadian Wildlife Service

Parks Canada

Indian and Northern Development

Natural Resources Canada

Comments and advice were received from Envronment Canada (Environmental Protection Service and Canadian Wildlife Service) and Natural Resources Canada. These comments were taken into consideration in the EA and preparation of this report. In particular, questions regarding the project that were raisied by the FAs were incorporated into a list of outstanding questions compiled by DFO and sent to Redfern in 2002. Redfern subsequently responded to the questions in April 2004.

4.2 Other Relevant Agencies, First Nations, and the Public

DFO also received comments and advice from various agencies First Nations groups and the public. The focus of the comments was related to sustainability, cumulative environmental effects, water quality, fisheries and wildlife. Provincial regulatory agencies who provided advice and comments for matters that fall within their areas of expertise included the BC Ministry of Environment, Lands and Parks (now Water, Land and Air Protection), the BC Ministry of Energy and Mines, BC MOF, the Yukon Territorial Government.

The State of Alaska (Office of the Governor, and Alaska Fish and Wildlife Department), U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. National Marine Fisheries Service also expressed interest in the Project and provided relevant comments and advice.

The Taku River Tlingit First Nation and the Douglas Indian Association provided comments on, among other things, traditional use of resources, and wildlife.

Comments were also received from environmental groups and the general public.

5.0 ENVIRONMENTAL EFFECTS

5.1 General Description of the Environment

Aquatic Environment

The Tulsequah Chief minesite sits on the left bank of Tulsequah River, approximately 12 km upstream of its confluence with Taku River and 20 km upstream of the Canada/Alaska border. Redfern's application documents (1997) provide a thorough description of the environment at the mine site and along the proposed access route.

The glacial source of the Tulsequah River is subject to outbursts from glacial lakes that fill the 2 km wide floodplain about twice seasonally in summer. These flows often scour and fill the braided channels to new configurations. In winter the water clarifies with higher proportion of groundwater inflows.

The Tulsequah River system supports populations of coho and sockeye salmon, Dolly Varden char, mountain whitefish and sculpin.

Shazah Creek wetland associated with a tributary ~ 2 km upstream of the minesite and Flannigan slough near the confluence of Tulsequah River with the Taku River form valuable rearing habitat for anadromous fish species and migratory birds. Spawning occurs in the lower ends of tributary streams, most notably Chasm Creek.

The Taku River system remains mostly undeveloped, supporting U.S. and Canadian commercial salmon (pink, chum, coho, chinook, sockeye) fisheries amounting to hundreds of thousands of fish caught annually through both U.S. and Canadian fisheries.

Redfern's proposed access road route passes through several watersheds which support runs of coho, sockeye, chinook, and pink salmon, Dolly Varden char, bull trout, coastrange sculpin, mountain whitefish, stickleback, cutthroat trout and arctic grayling, and crosses the Sloko River and Upper Nakonake River which are navigable.

Terrestrial Environment

This area supports various wildlife species, notably grizzly bear, caribou, moose and mountain goat. Sensitive habitat areas along the proposed access route have been identified, including the following among others:

- Shazah wetland for grizzly bear
- Shazah pass for mountain goat
- Patch habitat along Nakonake and Silver Salmon rivers for grizzly bear
- Sloko pass for moose and grizzly bear
- O'Donnel and Spruce/Wilson/ Blue canyon areas for caribou.

The East Atlin caribou herd is one of three herds comprising the Southern Lakes caribou population. In turn, this population is part of the Northern Mountain Woodland Caribou population. Canadian Wildlife Service's 2004 advice provided the present status of the caribou population.

Existing Developments

Remnants of the previous mining that ended in 1957 remain across the Tulsequah River from the existing minesite, including tailings piles and abandoned mine, mill and townsite.

Several lodges and a number of recreational cabins line the Taku River upstream but the majority of the land use lies primarily downstream of the Canada/U.S. border.

5.2 Effects of the Project on the Environment

A list of questions regarding outstanding issues following the 1998 CEAA review of the project, and adopted by DFO for inclusion in this screening level EA were provided to Redfern Resources Ltd. in 2002. These questions form the basis of the environmental assessment and in determining what effects the project could potentially have on the environment.

Redfern Resources provided a response to the questions on the list to DFO in 2004 and their response was subsequently reviewed and commented on by various reviewers. The comments received were considered in the determination of the potential effect the project could have on the environment.

Tables 1, 2, and 3 identify the potential direct adverse effects of the proposed project on key VECs, effects of the environment on the project, and the effects of project-related changes in the environment on Valued Social Components (VSCs). The tables also contain information on proposed avoidance and mitigation measures and identify the significance of the residual environmental effects that are likely to exist after mitigation. Note: All question numbers highlighted in Tables 1-6 correspond to the appropriate question addressed in Redfern's response of April 2004 to the 115 questions posed to them by DFO in 2002.

A residual effect is any measurable or demonstrable environmental effect remaining after mitigation. Residual effects have been assigned a value:

0 – None - no environmental effects are anticipated.

1 – Low - environmental effects are mitigated such as there are no residual effects and therefore not significant.

2 – Intermediate - environmental effects will result in effects and will require the proponent to develop a mitigation plan to render them insignificant.

3 – High - significant environmental impacts that may cause the project to be redesigned or denied.

4 – Unknown - potential environmental effects that will require more study by the proponent to determine the significance of environmental effects followed by the development of an appropriate mitigation plan.

The determination of the rating was based on the careful examination of the mitigation proposed and best professional judgement of the efficacy of the proposed mitigation measures. For those potential environmental effects with a rating of zero (0) or one (1) it was determined that there would be no residual effects. Those components that result in a residual effect need not be considered further in the cumulative effects assessment.

It was further determined that those VECs/VSCs with a residual effect rating of two (2) or higher would be assessed to determine whether any cumulative effects might arise through interaction between project-specific effects and similar effects from other past, present or reasonably foreseeable activities/projects (see Section 7.0 - Cumulative Environmental Effects).

5.2.1. Effects on Aquatics Resources

Anticipated effects of the Project on aquatic resources are summarized in Table 1.

5.2.2. Effects on Terrestrial Resources

Table 2 summarizes the potential effects of the Project on terrestrial resources.

5.2.3. Effects on other Valued Environmental Components and Valued Socio-economic Components

Table 3 summarizes the effects of the Project on air quality, health and safety, physical and cultural heritage, use of lands and resources, and historic archaeological, paleontological or archictectural objects.

5.3. Effects of the Environment on the Project

Table 4 summarizes anticipated effects of the environment on the Project.

5.4. Effects of Changes to the Environment on Valued Social Components

Table 5 summarizes effects on valued social components resulting from potential changes to the environment caused by the project..

The TRTFN have identified numerous traditional activities that they currently practice involving resources that would interact with the proposed Project. These include hunting, trapping, fishing, plant harvesting, and use of a traditional trail to a traditional camp on the Nakina River.

Potential impacts of the proposed Project on those activities and related social impacts identified by the TRTFN were addressed by Redfern in their 2004 response to the list of 115 questons.

The Douglas Indian Association (DIA) identified concerns of water quality impacts that pose risk to fisheries resources supporting subsistence and commercial fisheries conducted by some of their members. Redfern addressed these concerns in their 2004 response.

5.5. Accidents and Malfunctions

In addition to malfunctions caused by the environment noted in Table 4, several of Redfern's responses concern accidents and malfunctions caused by the Project. Applicable issues and their mitigation are discussed in Table 6.

5.6. Advice Received on the DFO 2002 List of Issues

5.6.1 Expert Federal Authorities

Upon receipt of Redfern's April 2004 response documents, DFO invited comments from the FAs.

DFO internally referred Redfern's April 2004 response documents to DFO's Habitat and Enhancement Branch Yukon-Transboundary Area office for their review and received the following comments:

June 11, 2004 Preliminary comments on issues #1-44.

June 14, 2004 Discussion on issues #1-44 summarized in Table 1.

Upon receipt of Redfern's response document of April 2004, DFO also solicited expert advice from Environment Canada, who focused their response to water quality issues and caribou. Correspondence from the Environment Canada is summarized as:

June 15 2004 Advice on of issues #1-7 (water quality)

July 8 2004	Advice on issue #14 (cumulative effects water quality)
22 July 2004	Advice on issue #3 (stability of tailings facility)
24 August 2004	Advice from Canadian Wildlife Service on issues # 67-79 (caribou)
3 September 2004	Clarification on advice from Canadian Wildlife Service on issues #67-79 (caribou)

Upon receipt of Redfern's report on geotechnical stability of the proposed tailings facility on Shazah fan, DFO solicited expert advice from Natural Resources Canada. NRCan's advice of 22 July 2004 is reflected in Table 1 issue #3 and is related to the stability of the tailings pond.

5.6.2 Provincial/Territorial Agencies

DFO received a letter from B.C. Ministry of Water, Air, Lands and Parks MWALP in May 2004 endorsing Redfern's response document. The B.C. Environmental Assessment Office has co-commissioned, along with Redfern, an Adaptive Management Plan to mitigate wildlife impacts and its supportive technical analysis document, as part of Redfern's response to DFO's list of outstanding issues.

DFO also distributed Redfern's response and supplementary technical report on wildlife to Yukon Territorial Government (YTG), Environmental Assessment Unit. Through subsequent discussions, YTG indicated that they had no mandate to respond to DFO without first receiving an application from Redfern for highway upgrades in the Yukon.

5.6.3 American Agencies

DFO provided a copy of Redfern's response documents to U.S. National Oceanic and Atmospheric Administration – National Marine Fisheries Service, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, State of Alaska Fish and Game Department, and State of Alaska Department of Natural Resources. Correspondence has been summarized below:

NOAA – National Marine Fisheries Service provided advice that outstanding issues can be resolved while maintaining the health and integrity of aquatic resources in the Taku River.

US Environmental Protection Agency provided advice related to water quality issues raised in the past and possible precedent under the Boundary Waters Treaty regarding locating a tailings impoundment within an active floodplain, and cumulative effects on water pollution of other industrial developments that may use the access road.

State of Alaska Department of Natural Resources provided advice related to water quality issues, stating that careful planning in during the development of the mine, combined with effective monitoring programs, is important and will be needed to protect the important fishery resources of the watershed.

US Department of Interior, Fish and Wildlife Service, provided advice related to water quality that could affect fish resources in transboundary waters.

5.6.4 First Nations

DFO included issues that were raised by the TRTFN in the list of questions that was provided to Redfern in 2002. Upon receipt of the response from Redfern to these questions in 2004, DFO distributed their response to TRTFN, and to DIA for comment.

DIA provided advice regarding water quality and sustainability issues.

TRTFN provided advice that focused on wildlife issues, use of lands and resources issues, health and socio-economic condition issues, cultural heritage issues, and sustainability issues. These issues are being addressed in the Adaptive Management Plan that is being prepared by Redfern along with the BC government.

5.6.5 Special Interest Groups

DFO distributed Redfern's response documents to the Transboundary Watershed Alliance, Environmental Mining Council of B.C., now affiliated with the Center for Science in Public Participation, and to the Society for Atlin's Sustainable Economic Initiatives. Correspondence relevant to the envorinmental assessment of the project has been summarized below:

The Society for Atlin's Sustainable Economic Initiatives provided advice to DFO on assorted issues of concern to their community.

The Transboundary Watershed Alliance provided advice to DFO on various aquatic issues #16-34 and concludes, "Redfern Resources has addressed the majority of DFO's questions concerning the access road. However, three key issues remain and additional work is required to resolve these. The risks of sedimentation to fish should be quantified, DFO's timing windows should be adopted (or a rationale developed for other timing windows), and the potential cumulative effects from proposed developments should be considered and addressed."

The Center for Science in Public Participation provided advice to DFO on specific aquatic issues.

5.6.6. General Public

As part of the harmonized EA process, the BC Environmental Assessment Office convened a public comment period in November/December 2001. They prepared a brief (6-page) update on the Tulsequah Chief Mine Proposal (November 2001), and established public repositories for project information in Atlin (Atlin Government Agent), Juneau (Juneau Public Library), Skagway (Skagway Public Library), Whitehorse (Whitehorse Public Library), Vancouver (Ministry of Energy and Mines) and Victoria (Environmental Assessment Office). Public consultation within BC and neighbouring jurisdicitions was also undertaken prior to 1998 Certificate decision as part of the review process.

The BC Environmental Assessment Office invited public comments on the proposal, in November-December 2001. The Environmental Assessment Office hosted public meetings in Atlin in December 2001 following project committee meetings in November 2001 which were open to the public. The State of Alaska hosted a public information session in Juneau in December 2001 and the Department of Indian Affairs and Northern Development hosted a public information session in Whitehorse in Decermber 2001. Clarifications were provided to questions raised at the information sessions, and participants were encouraged to convey their

comments to the Environmental Assessment Office before end of the public comment period in December.

Numerous letters were received from the public and special interest groups during the 2001 public comment period. Comments were mixed for and against the project proceeding, with opinions ranging between socio-economic and technical impacts and benefits. While those favouring the project cited economic benefits to communities, those opposed to the project cited concerns regarding impacts to water quality salmon stocks, tourism and wildlife resources. In review of the letters, DFO compared technical issues raised in correspondence and reports received against issues raised by agency reviewers. Through this compilation, all technical issues raised in the public comments were included or represented in the list of outstanding issues that DFO posed to Redfern in June 2002.

Following the public comment period in 2001, Atlin residents petitioned their provincial member of Legislature against the project proceeding. The petitioners believed that the re-activation of the Tulsequah Chief mine would compromise the socio-economic health of the region and its surrounding watersheds.

In response to over 1100 letters to the office of Minister of Fisheries and Oceans from the public and government representatives, DFO is planning a 30-day comment period for the public on this screening report in accordance to section 18(3) of CEAA. Notification of the public comment period on this screening report will be advertised in local newspapers.

6.0 MITIGATION MEASURES

6.1 Fisheries and Oceans Canada – Habitat and Enhancement Branch

Tables 1, 4 and 6 outline in general measures that would be implemented to mitigate potential impacts to fish and aquatic habitats.

Before DFO can issue a Section 35(2) authorization for harmful alternation, disruption or destruction of fish habitat associated with the effluent discharge system in Tulsequah River; Redfern will be required to complete a Fish and Fish Habitat Mitigation and Compensation Plan to the satisfaction of DFO. While the status of some elements of the overall plan have not changed substantially since the initial 1998 CEAA report, other elements will require modifications from those previously determined to reflect new project designs and information. These would include Timing Windows, Access Management, Sediment Control, revised Habitat Compensation, and the posting of Letter of Credit by Redfern Resources Ltd. TC will be consulted to ensure that any fish habitat compensation elements do not interfere with navigation. Briefly, a Mitigation Plan and Compensation Plan would include the following elements that would apply to the construction, operation and decommissioning of the various project components:

Mitigation Plan:

1. Environmental Supervision Plan
2. Road Drainage Management Plan

3. Aquatic Effects Monitoring Plan
4. Sediment Control Plan
5. Vehicle Servicing Plan
6. Fish Passage Plan
7. Fish Salvage Plan
8. Timing Windows
9. Road Design Elements
10. Bridge Preservatives Measure
11. Revegetation of Road Cuts/Fills/Sideslopes
12. Access Management

Compensation Plan

13. Habitat Compensation Plan
14. Instream Habitat Creation

To ensure that these plans are implemented DFO will require the posting of a Letter of Credit that can be drawn upon to take corrective action or construct the appropriate habitat, should the company fail to do so.

6.2 Transport Canada (TC) – Navigable Waters Protection Program (NWPP)

Transport Canada, based on discussions with the Proponent, has determined that with the implementation of mitigation measures, the crossings over the Sloko River and Upper Nakonake River will not result in a substantial interference to navigation nor have a significant negative effect on the environment within the vicinity of the bridge crossings. Mitigation measures considered include installation of clear span bridges with a vertical clearance higher than 1.5 m at Q100. The Proponent will ensure these bridges are properly constructed, using the proper safeguards during construction. Transport Canada will work with Redfern to establish the Section 5(1) permit terms and conditions during the Navigable Water Protection Division approval process.

6.3 Environment Canada

Environment Canada provided comments related to the effectiveness of the diffuser system to mitigate the potential effects of mine effluent on water quality.

Advice received from the Canadian Wildlife Service (CWS) in 2004 noted their concern over the sensitivity of the Caribou herd and potential impacts. CWS states that the conservation concerns for the East Atlin herd would be best addressed through the development of a comprehensive management plan involving all stakeholders. CWS also recommends that the proponent participate in the development of the East Atlin herd management plan and adhere to all recommendations and subsequent actions arising from the plan.

CWS provided the following specific recommendations for mitigative/ monitoring measures concerning caribou:

- For key times of the year (for example, calving) the distribution of the males should be treated separately from females.

- There should be assurance that ancillary development along the road will not occur and that the road will be decommissioned at the end of the mine's lifetime.

Tables 2, 4 and 6 outline in general measures that would be implemented to address concerns raised by CWS. With respect to the issue of the road, DFO committed that the environmental assessment would consider the potential environmental effects of the access road should it be used after the mine site is closed. In that respect, and to address this issue, the B.C. Government directed the company to decommission the road, following mine closure, in the 2002 Project Approval Certificate. Redfern Resources Ltd. has committed to adhering to this condition of their permit and will decommission the road when they close the mine.

Regarding the potential impacts to wildlife, Redfern, in collaboration with the BC government, have developed a draft Adaptive Management Plan (AMP) that addresses these issues. CWS has been advised by WLAP that BC is committed to working with government partneres and stakeholders to ensure the long-term viability of the East Atlin Caribou herd through the management measures that will sustain or increase the current population. As a result, DFO and EC are satisfied that the concerns raised by CWS will be addressed and that the BC government will ensure that the measures are implemented appropriately.

6.4 Provincial Requirements

The provincial Project Approval Certificate issued in December 2002 specifies various requirements under 11 categories under which Redfern must implement the project. Included is the development and implementation of the Adaptive Management Plan , a draft of which Redfern submitted in April 2004. The specific conditions of the Project Approval certificate are listed on the provincial Environmental Assessment Office website at http://www.eao.gov.bc.ca/epic/output/html/deploy/epic_project_home_72.html

Another series of mitigative measures are integral to the conditions of approval of Redfern's Special Use Permit (SUP) for their proposed access road (appendix 6 of Redfern's April 2004 response document). The SUP lists numerous preconstruction requirements, requirements for plans, implementation of plans, construction requirements, operations and maintenance requirements, access road restrictions, requirements of environmental supervision plans and decommissioning. DFO as an RA has reviewed the SUP and is satisfied that most of the mitigtion measures required to maintain the environmental effects below the significant threshold have been addressed.

Further mitigative measures would be developed in support of provincial *Mines Act* and *Waste Management Act* permits that involve reclamation, water quality treatment, monitoring and decommissioning that would be developed in detail at a later stage of review.

6.5 Yukon Fish and Wildlife Management Board (YFWMB)

The Yukon Fish and Wildlife Management Board's 2004 has also expressed concern over potential impacts to the Atlin Caribou herd, and recommend that a detailed management plan, including harvest and access management provisions be developed as part of the mine approval process. DFO is satisfied that the AMP provided by Redfern and supported by the BC government addresses the concerns raised by the YFWMB.

6.6 Taku River Tlingit First Nation

The TRTFN have expressed concern over the measures that will be implemented to ensure the protection of wildlife, but have also expressed a concern that potential impacts to TRTFN that could result from the failure of wildlife management plans and mitigtion measures meant to protect wildlife have not been adequately considered. DFO is satisfied that the wildlife adaptive management plan will address the issues raised by the TRTFN and that the BC government will ensure that that the appropriate measures are carried out.

The TRTFN have also expressed concern over the potential impacts to social values, including hunting, trapping, fishing, trail use and medicinal plant harvesting, due to the increased use of the access road and the continued use of the access road following mine closure. The BC government permits issued to Redfern for the mine operation and access road construction address the issues of road use and road decommissioning. DFO is satisfied that restricted road access with security to monitor road use, and the decommissioning of the access road upon closure of the mine, will address the concerns raised by the TRTFN.

6.7 Analysis of Mitigation

Assessment of mitigative measures proposed for construction and operation of Redfern' proposed minesite found that measures, pending their detailed development and approval and incorporation in regulatory permits or approvals, will when implemented mitigate impacts such that will not likely result in significant environmental effects.

Regarding Redfern's proposed access road, the mitigation measures provided by Refern Resources Ltd. are sufficient to avoid impacts to fish and fish habitat. DFO has been advised that, in the absence wildlife management plans, road-related impacts on wildlife species could be substantial. These potential impacts could then extend to the TRTFN and Atlin residents in regards to health and socio-economic conditions, and use of lands and resources for traditional purposes by aboriginal persons. B.C. MWLAP has advised that Redfern's proposed adaptive management plan would set out an effective and adaptive approach to avoiding or mitigating potential project related impacts. DFO has a role as part of the provincial MOF committee looking at the Special Use Permit for the Tulsequah access road so that the potential impacts related to the access road will be mitigated.

7.0 CUMULATIVE ENVIRONMENTAL EFFECTS

Under subsection 16.1(a), DFO as the lead RA is required to consider cumulative environmental effects (CEA) that are likely to result from the Project in combination with other projects or related activities that have or will be carried out and that could cause impacts to the environment in the area of the project. Project induced effects need not be significant to be included in the assessment of cumulative effects, however, there must be a residual effect after the implementation of mitigation measures to warrant consideration. Therefore, only those factors of the envronment where unmitigated residual effects are anticipated are considered in the cumulative effects assessment.

Projects that have been or will likely be carried out, that could result in cumulative effects when added to potential impacts resulting from the construction of a redesigned 17 km section of the 160 km access road and the installation of the effluent diffuser, were considered. Cumulative effects associated with other aspects included in our scope of project were considered in the 1998 report and were found to be not significant. The past and present activities in the immediate area that could affect the same VEC/VSCs as the proposed project are historic mining, placer mining, mineral exploration, commercial and subsistence fishing, recreational fishing and boating, hunting, and tourism, road construction, general highway usage, community development and forestry. Projects that are likely to take place are mineral exploration, placer mining and mine development at Polaris Taku and Big Bull.

The contribution of a given project to the cumulative effect of other projects can be considered in terms of predetermined thresholds of effect on a particular environmental component. The effects of the project are considered significant when they are combined with the effects of other activities or projects to exceed the threshold and result in an unacceptable effect. Conversely, the incremental effects contributed by the project are not significant when baseline conditions already exceed the threshold or when, combined with the effects of the other projects, they remain below threshold levels.

7.1 Analysis and Mitigation of Effects

DFO completed an analysis into to whether the residual effects resulting from the Project can become significant when they cumulate or interact with the effects of other projects or activities. Information pertaining to cumulative effects has been generated subsequent to the 1998 CEAA Screening report that included a conceptual-level CEA. Data on wildlife and on water quality as discussed in direct effects tables (Tables 1-6) warrant a re-analysis of the CEA.

In general it was found that water quality will be improved following construction of the Tulsequah Chief mine. Currently, toxic materials are leaching into the Taku River from historic mining activities at the site of the proposed Tulsequah Chief mine. In construction of the new mine, Refern Resources Ltd. will address this issue as part of its mine plan, and effluent treatment for mine effluent.

Concerns were raised regarding the impacts of the Project on wildlife. Refern Resources has poposed an AMP to mitigate impacts to wildlife species such as caribou, moose, grizzly bear, and mountain goat. The B.C. government endorses the Redfern AMP and is satisfied that the issues can be addressed.

Also, much concern was raised over the potential for the access road, which is to be decommissioned, to remain open following the closure of the mine. Various public groups and First Nations claim that, should the road remain open after the mine closes, this would have a cumulative effect on fish, wildlife and traditional activities. However, it is a condition of the Certificate of Approval, which allows for the construction of the mine and undertaking of mning activities, issued by the Province of British Columbia that this road be decommissioned following mine closure. Redfern Resources Ltd. has committed to adhering to this condition of their Approval.

It has also been a concern of the public and First Nations groups that unauthorized use of the access road will have asignificant effect on wildlife and traditional activities, and that this should be treated as a cumulative effect. However, the access road will have controlled access, monitored by mine security, and the road use is regulated through a Special Use Permit (SUP) issued by the BC Government. Redfern Resources Ltd. has committed to adhere to the conditions of the SUP for use of the access road.

7.2 Results of Cumulative Effects Assessment

For the purpose of this EA, DFO found that, after taking into account the implementation of proposed mitigation measures appropriate to the project, any environmental effects which were:

- Low magnitude;
- Short duration and frequency;
- Confined to the vicinity of the Project; and
- Reversible;

are not likely to be significant.

(Are these the only type of environmental effects that DFO found? If so, we should be more assertive and state that DFO found that any environmental effects which were low in magnitude etc. are not likely to be significant.)

Considering the mitigation measures proposed by Redfern Resources Ltd., and the support given by the FAs and the BC Government, DFO has determined that none of the effects identified in the direct effects tables resulted in significant adverse residual effects values that would warrant further analysis for cumulative effects. Therefore, DFO has determined that there are no cumulative environmental effects associated with the construction, operation, maintenance or decommissioning of the Tulsequah Chief Mine.

8.0 SCREENING SUMMARY

This screening review has focused on the environmental effects of changes to components of the Tulsequah Chief project, redesigned components, and new information concerning effects that complement the harmonized review concluded in 1998. Details of new aspects of the Project, potential effects of the Project on VECs/VSCs, and proposed mitigation measures have been outlined in the preceding sections of this report.

Aquatic Resources

Table 1 provides a summary of potential direct effects of the project on water quality and fisheries resources, and reference measures proposed by Redfern to mitigate them.

Requirements for Redfern to address provincial laws and statutes are included as conditions of Redfern's Project Approval Certificate (December 2002), and its Special Use Permit 523154. Requirements under other provincial laws are pending review of final designs, such as the *Mines Act*, and *Waste Management Act,* with a complete list included in Redfern's Project Approval Certificate. Opportunities for review of final plans have been identified in Redfern's responses.

Redfern will be also be required to operate in compliance with the Federal *Fisheries Act* and *Navigable Waters Protection Act.* At a later stage of review, final design of various mitigation measures, monitoring and supervision plans that would be needed to achieve such compliance would be subject to completion upon final mine and road planning.

Wildlife Resources and Valued Social Components

Tables 2 to 6 provide a summary of potential effects of the project on wildlife resources and VSCs, and reference measures proposed by Redfern to mitigate them. Cumulative Environmental Effects that could result from the interaction of other projects with the Project were considered and found to be non-existent.

The federal RAs will rely on the BC government to lead on identifying and implementing measures necessary to protect those wildlife resources and VSCs. In this case, requirements are included as conditions of Redfern's Project Approval Certificate (December 2002), and its Special Use Permit 523154. Additonal requirements are pending review of final designs, with a complete list included in Redfern's Project Approval Certificate.

Review of Redfern's response documents, mitigative measures, commitments to develop and implement mitigation measures and reviewer advice on them has enabled DFO to reach a determination under Section 20(1) of CEAA.

9.0 SCREENING DECISION

Fisheries and Oceans Canada has completed this CEAA screening review of the environmental effects involved in Redfern Resources Ltd.'s proposed Tulsequah Chief Mine project in northwestern British Columbia. DFO has conducted an EA on project changes and information received subsequent to its earlier CEAA decision in 1998. Transport Canada became an RA with the transfer of NWPA program, DFO continued as the lead RA for the EA during the transition period. After taking into consideration the results of the EA, including potential effects on the environment, potential cumulative effects and public comments received to date on this project, Fisheries and Oceans Canada, on behalf of DFO and TC, have determined that with the implementation of the proposed mitigation measures the project is not likely to cause significant adverse environmental effects.

However, several isssues of concern were raised through the EA that lie within the jurisdiction of Provincial or Territorial governments that are generally regarding wildlife management, land use planning, and issues that are addressed through the provincial permitting process. These matters will be forwarded to the appropriate agencies for their information.

Environmental Screening Report Approved by:	R. Sisler	04.12.03
Name:	Robert Sisler, Regional Manager Environmental Services Transport Canada Pacific Region	Date

The above has reviewed this environmental screening report and verifies that it meets the requirements of the CEAA.

Environmental Screening Report Approved by:	Susan Farlinger	3/12/04.
Name:	Sue Farlinger, Regional Director Oceans, Habitat and Enhancement Branch, Fisheries and Oceans Canada Pacific Region	Date

The above has reviewed this environmental screening report and verifies that it meets the requirements of the CEAA.

Table 1 – Environmental Effects Related to the proposed Tulsequah Chief Mine, Minesite and Access Road on Aquatic Valued Ecosystem Components (VECs) (Degree: 0-None, 1-Low, 2-Intermediate, 3-High, 4 -Uncertain)

VECs	Potential Direct Effects	Discussion of Issues and Mitigation Measures (Issue # reference to Redfern Response, April 2004)	Residual Effects
Water Quality	Seepage from Tailings Impoundment	**Issue #1 (double vs single poly liner under tailings facility);** Redfern's response asserts that the risk of problems from tailings seepage is low, owing to a thick poly liner to be installed over a prepared bed, limestone additions to neutralize tailings acidity, disposal of inert tailings, and a contingency groundwater pump-back system (see issue #2 below). **Analysis:** DFO refers to Environment Canada's and State of Alaska's advice that a second poly liner is not necessary given that a monitoring/ collection program would be used.	1
	Seepage from Tailings Impoundment	**Issue #2 (contingency groundwater pumping at tailings facility);** Redfern's proposed groundwater monitoring and contingency pumpback system would be prudent to prevent possible tailings seepage from entering sensitive Shazah slough. The details of the monitoring program would be set as part of the Environmental Effects Monitoring program in support of a provincial Waste Act permit. **Analysis:** Environment Canada expects Redfern would drill wells adjacent to the toe of the proposed tailings dam to monitor groundwater quality, estimate groundwater flows, and if necessary, intercept contaminated groundwater so that it does not reach Shazah Slough. Thresholds for collection and pumpback of tailings seepage in groundwater, together with number of wells, their locations, capacities, and schedules would be developed during detailed review of monitoring plans in support of a provincial Mines Act approvals at a later stage of review	1

VECs	Potential Direct Effects	Discussion of Issues and Mitigation Measures (Issue # reference to Redfern Response, April 2004)	Residual Effects
	Failure of tailings facility	**Issue #3 (stability of tailings facility):** Redfern's 2004 response asserts that despite a non-acidic nature of the proposed tailings, they conducted a field survey in spring 2004 to determine the method of and timing of deposition of the Shazah fan materials in support of a Mines Act permit. This assessment was also in compliance with a requirement of their 2002 Project Approval Certificate to conduct this assessment and provide its results to agency reviewers. **Analysis:** Conservative factors for setting criteria for tailings structure design at a later stage of review have been identified that would appear appropriate to withstand geotechnical risks at the proposed tailings storage site location on Shazah fan. Redfern has acknowledged these and is aware of potential costs associated with achieving them.	1
Water Quality	Failure of the tailings facility	**Issue #4 (flow return periods for tailings facility design):** Redfern plans on designing the tailings facility to provincial standards to fully withstand 200-year return period flows. **Analysis:** Conservative factors for setting criteria for tailings structure design at a later stage of review have been identified that would appear appropriate to withstand geotechnical risks at the proposed tailings storage site location on Shazah fan. Redfern has acknowledged these and is aware of potential costs associated with achieving them.	1
	Mine effluent quality	**Issue #5 (effluent meeting Metal Mine Effluent Regulations):** Redfern's proposed effluent would require treatment to meet Canada's Metal Mine Effluent Regulation criteria, as well as provincial Waste Management criteria. **Analysis:** Redfern would be required, and acknowledges that it would have to meet federal standards under the recently revised Metal Mine Effluent Regulations. The proposed treatment plant appears capable of complying with federal effluent regulations. In the case of plant upset, the company can suspend milling and divert mine site effluent to the tailings dam for temporary storage. Federal regulations prescribe maximum effluent concentrations and effluent monitoring for acute toxicity, subiethal or chronic toxicity, and additional metal parameters. The provincial effluent permit may prescribe lower, more stringent effluent concentrations and more frequent monitoring than the federal regulations require. This may include site-specific standards conforming to U.S. standards. EC will review the final effluent treatment plant design and advise the province on permit conditions. Federal and provincial inspections will ensure the company's effluent complies with regulations and permits.	0

VECs	Potential Direct Effects	Discussion of Issues and Mitigation Measures (Issue # reference to Redfern Response, April 2004)	Residual Effects
Fish Habitat, Water Quality	Fish habitat impacts from installation of a mine effluent discharge system	**Issue #6 (fish habitat effects of effluent discharge system):** Redfern's preferred discharge system comprises of a low pressure groundwater exfiltration system developed by Komex for the B.C. provincial government. This system would entail trenching 3 m deep across much of the Tulsequah River floodplain. As this would transect fish habitat, DFO's Policy for the Management of Fish Habitat would apply, as would its principle of No Net Loss of fish habitat. If a harmful alteration, disruption or destruction of fish habitat was anticipated during construction, then offsetting habitat compensation would be required under a Fisheries Act authorization. Potential compensation likely could be developed in the Tulsequah system, with details to be developed at a subsequent stage of review. Redfern indicates that it would prefer to utilize the Komex system for mine effluent discharge, pending completion of pre-design investigations in support of a Waste Act permit. **Analysis:** DFO anticipates reviewing detailed design plans for construction, maintenance and decommissioning of an effluent discharge facility, including any mitigation and compensation plans as may be appropriate (e.g. timing windows, stream isolation techniques, sediment control, offsetting habitat compensation etc.), such to comply with DFO's Policy for the Management of Fish Habitat. This review would be undertaken in support of a federal *Fisheries Act* authorization at a later stage of review. DFO understands that detailed review of the operation of a discharge facility which has yet to be finally selected would be undertaken in support of a provincial Waste Management Act permit in a later stage of review. Tulsequah River flows vary greatly and carry high bed load of sediment. This causes frequent migration of the river channel or thalweg in the gravel floodplain. Floods may scour new channels which could expose and damage the buried diffuser, or severely reduce its capacity to dilute effluent in river water. EC and DFO would review Redfern's submissions about the river's hydrology and the outfall design to ensure the following: • the pipe will remain safely buried • effluent will not exceed allowed concentrations • effluent receives sufficient dilution to reduce risks to any spawning beds • the operational plan includes frequent inspections, and • discharge can be stopped for an extended period to effect any needed repairs. DFO understands that Redfern is aware of potential costs associated with the facility.	1