

## Technical Tips

The proposed conceptual design and sequence of construction for the Horsefly debris groins are shown in Figure 2. Several debris groins will be spaced evenly along the actively eroding outside bank of the river. The groins will be spaced at intervals of approximately four times the distance that the individual structures extend out into the river.

Noteworthy items and features regarding debris groins are:

- Individual structural members (logs) of debris groins and necessary ballast can be easily maneuvered into place using readily available machinery.
  - The top logs are positioned so as to capture submerged and floating debris carried by the stream during storm events.
  - Properly constructed debris groins will eventually capture sufficient floating debris to function similarly to natural large wood debris structures.
  - In time, smaller wood debris captured in debris groins will decay and become ineffective, but subsequent floods will deliver a new supply of wood debris to the debris groins.
  - Smaller wood debris captured by the structural members provides a significant degree of protection to the structural members themselves.
- The top logs are arranged in such a manner as to redirect the horizontal forces (created by the water pressure) downwards, thereby significantly reducing the amount of ballasting required to stabilize the structures. This principle is similar to that employed when constructing typical “A-frames” which are frequently used to support fish fences.
  - Appropriately located and spaced, debris groins in series can be used to provide bank protection where desirable and are a more “fish-friendly” alternative to conventional shot-rock.
  - Debris groins should be constructed so as not to be overtopped during extreme flood events. Otherwise, smaller debris accumulated at lower discharges may be washed downstream during extreme floods and groins may not function as well as intended.

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## Mineral Tenures and Road Deactivation

*R. Tim Henneberry*

This article outlines two key aspects of mineral tenures and road deactivations: mineral exploration impacts in coastal watersheds, and identifying active mineral tenures in a specific watershed.

### **Mineral exploration impacts in coastal watersheds**

The Mineral Tenure Act and Regulations govern mineral exploration and the Mineral Exploration Code sets the guidelines for acceptable practices in British Columbia. Mineral exploration is a success-contingent, progressive business. The first task is to locate and acquire a property of merit, which may be either a previously known occurrence, or a new occurrence. The latter is located by grassroots exploration of areas of known exploration potential, government surveys (e.g. for regional geochemistry programs and regional mapping programs) or prospecting of new road construction, primarily by forest industry.

Mineral exploration usually takes place in stages; positive results in each phase of exploration are required to initiate the next phase. Four-by-four road access is required at all stages. Stage I (Preliminary) involves prospecting, geological mapping photographs, and sampling rocks, silts and soils for analysis, as well as preliminary ground geophysical surveys, including VLF-EM and magnometer. Ground disturbance is minimal, and the only direct impact on the watershed is the establishment of cut grids.

Stage II (Initial Advance Exploration) involves detailed sampling of occurrence at regular intervals, and possible use of plugger and explosives to loosen surface materials. Ground disturbance remains minimal in stage II. The area disturbed by blasting would be less than 10 m<sup>2</sup> and only 10 to 20 cm deep.

Stage III (Trenching) involves excavator or backhoe

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trenching to test zone of mineralization along strike. These trenches are dug to bedrock, mapped, sampled, photographed, refilled, and reseeded. Ground disturbance ranges from minimal to moderate. An access trail may be required that could require the cutting of some mature timber.

Stage IV (Drilling) involves percussion, churn, or diamond drilling depending on exploration target. Ground disturbance is moderate, and includes construction of cat trails to move drill into site and between sites, clearing of an area of up to 15 m by 15 m for drill and support equipment. This can require timber to be cut; in addition, a sump must be established for wastewater. Upon completion of drilling program all sites must be leveled, contoured as necessary, and reseeded. Access trails must also be reseeded. Negative exploration results from this phase do not necessarily result in abandonment of tenures.

Stage V (Bulk testing) will involve underground development through adits or shafts, and surface development through open cuts. Up to 10,000 tonnes may be taken in a bulk sample. A performance bond will be required before work can commence. Ground disturbance is moderate to significant, and includes the establishment of access roads for equipment and materials and clearing of the site for equipment, supplies, and stockpiles of materials. Upon completion of bulk sampling program the site is leveled, contoured if required, reseeded and replanted. Equipment, supplies, and materials are removed. Negative exploration results from this phase do not necessarily result in abandonment of tenures. Positive results will lead to feasibility study and possibly production.

Production is the final stage; however, it is beyond the scope of this report to outline the requirements for a fully producing mine. The preceding discussion clearly shows the need for road access to move in personnel, equipment, and supplies, and to move out supplies and materials. Access is a key requirement for initiating and undertaking exploration programs. Without roads, costs for access alone can increase to a point at which exploration is no longer feasible. However, it is possible for cost-effective exploration to proceed when roads established by the forest community can be maintained in a semi-serviceable state, i.e., to allow four-by-four access.

### Identifying active mineral tenures in a specific watershed

All watershed deactivation proposals must include information on active mineral tenures in the watershed. Most of this information can be readily obtained from

the Ministry of Energy and Mines web site, by following these steps:

**Step 1** - Identify the map sheets hosting the watershed. At present the Mineral Tenure Branch of Energy and Mines uses the 1:50,000 NTS maps, although some areas use the 1:20,000 TRIM maps. A copy of the map showing the province divided into 1:50,000 or 1:20,000 sheets is available from the Gold Commissioner in Victoria, Vancouver, or Kamloops. This map is not yet on the ministry web site.

**Step 2** - Enter the Mineral Tenure Branch web site at [www.em.gov.bc.ca/MiDA/mguide1.htm](http://www.em.gov.bc.ca/MiDA/mguide1.htm). Search the database for active tenures in the watershed. All 1:50,000 sheets are divided into an east and west section. You then enter the full sheet information in the sheet to search box (092L08W). You click the *active tenures only* box and click the *all tenures* box as you are looking for all tenures: placer, mineral, and coal.

**Step 3** - The database lists a table of all active tenures on map sheet 092L08W. The tenures are listed numerically by record number. The table can be downloaded as a comma delimited file for any popular spreadsheet. The table lists: record number, claim name, client number, percentage owned, claim sheet, good to date, status, mining division number, mining division name, number of units, and tag number.

**Step 4** - Identify the tenure holders of individual tenures. The client number column lists the identification number of each tenure holder of each active tenure on the map sheet. Double click on the number to bring up the current contact information for the tenure holder. Regulations prohibit the downloading of a complete table, so each tenure holder must be downloaded as a separate text file.

**Step 5** - Eliminate all tenures outside the watershed by consulting the placer, mineral, and coal tenure maps. This can be done at another location in the Mineral Tenure Branch web site (the *Map Place*). Crown granted mineral claims are not listed with mineral tenures and are not shown on the *Map Place* maps. The only way to check for crown grants is to examine printed copies of the maps. The Mineral Titles Branch is gradually adding maps to its web site, a process that may take several years to complete.

**Step 6** - Create a sublist that shows only the active tenures in the watershed. Contact information for crown grants must be obtained from the Resource Revenue Branch of the Ministry of Energy and Mines in Victoria. At present, active tenures and crown grants have to be manually plotted onto the watershed

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deactivation proposal maps. When checking mineral tenure maps on the *Map Place*, note that the maps can be up to 30 days out of date and do not yet show crown granted mineral claims. These cannot yet be printed off as full copies; rather, it is possible to print only the information in the window.

Provincial Contacts:

### Mineral Tenure: Gold Commissioners

*Vancouver Island*

3rd Floor - 1810 Blanshard Street

Victoria, B.C. V8V 1X4

Kim Stone - 250 952 0542

*Coast / Liard*

300 - 865 Hornby Street, Vancouver, B.C. V6C 2Z5

Byron Hosking - 604 660-2672

*Kamloops / Okanagan*

250 - 455 Columbia Street, Kamloops, B.C. V2C 6K4

Walter Poohachoff - 250 828-4540

### Crown grants: For ownership

Resource Revue Branch

7th Floor - 1810 Blanshard Street

Victoria, B.C. V8V 1X4

Cindy Head - 250 952-0192

### Mineral Exploration Code: District Engineers

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2080B Labieux Road, Nanaimo, B.C. V9T 6J9

Greg Carriere, P.Eng. 250 751-7372

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Vacant 250 751-7377

*Kamloops / Okanagan*

200 - 2895 Airport Drive, Kamloops, B.C. V2B 7W8

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### Publications:

Mineral Exploration Code

Mineral Title Staking Guide

Index to Mineral Title Reference Map at 1:2,000,000

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## Perspectives

**Wanted:** your perspective on various controversies in the field of “watershed restoration.” This is a new column in *Streamline*, suggested by our readers, and we encourage you to submit your ideas. Your perspective should be a short dialogue of approximately 500 words. Send it to Donna Underhill at [dbuirinc@axion.net](mailto:dbuirinc@axion.net), or fax to 604-224-6880. Thanks to Gerry Leering for sending in the first perspective. We include a response by Pat Slaney of the Watershed Restoration Program.

### Restoration vs. Rehabilitation

I must first admit to being a recent migrant back here to Lotus-land from Ontario, returning to my roots where I went to grade school in North Vancouver. My 22+-year career as a biologist in Ontario includes over 14 years in the public sector and another 8 in the private sector. More recently I have become an R.P.Bio. in B.C. and have spent the last two years here, undertaking several stream enhancement projects on the north shore.

My perspective involves my personal semantic issue with the term watershed restoration. I am quite familiar with opportunities that are possible with stream enhancement and rehabilitation but remain perplexed on restoration. Can someone provide me with a rationale for the use of this term?

I can understand that one can restore things that have aged such as antiques or old cars, but how is this possible in the watershed context? Streams are dynamic geomorphologic features that are under a continual state of change. Riparian habitat is always under a state of growth and bed loads continue to move in a downstream fashion so how is it possible to restore this?

I would suggest that we become more accountable in our description of stream enhancement and rehabilitation and avoid the use of the term restoration. The public may be more on side with the understanding that watersheds cannot be restored since they are continually under a state of change. We must ensure the public have the understanding that the best we can