

January 31, 2007

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Director, Strategic Policy and Planning  
Environmental Assessment Office  
2<sup>nd</sup> Floor, 836 Yates Street  
PO Box 9426 Stn Prov. Govt  
Victoria, BC V8W 0V1  
CANADA

*Re: Public Comment Period; Draft Terms of Reference for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act*

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**REFERENCED DOCUMENTS:**

**April 7, 2006 Montana Department of Fish, Wildlife and Parks, RE:  
*Baseline Data Needs Associated with the Lodgepole Mine Project***

**Baseline Data Needs Associated with the Lodgepole Mine Project:**

Mark Deleray, Montana Fish, Wildlife and Parks, 4/7/2006

These recommendations for baseline data collection on basin-wide scales stem from the need to understand what fisheries resources currently exist at the immediate mining project site and in downstream waters, which may be impacted by the proposed development. Without these data, it will not be possible to assess or mitigate for potential impacts to these resources or monitor future changes. These data are required for informed decision-making and responsible resource management. The following sections provide brief rationale and a list of techniques for baseline data collection. In addition, there are fisheries datasets in the Flathead Basin, some ongoing for 25 years, which should be consulted.

**Fish Population Demographics in the Flathead and Wigwam rivers and their tributaries:**

- Presence/Absence surveys will provide information on species distribution and habitat use.
  - Conduct redd count surveys for westslope cutthroat trout and bull trout
  - Conduct electrofishing surveys to determine distribution of fish species, update the 1997 survey for the Flathead tributaries.
  - Conduct surveys during all four seasons, as possible.
  - Describe distribution of native fish assemblages and aquatic communities
- Abundance/Density surveys repeated over a three to five year period provide quantitative information to assess current population levels and demographics.

- Conduct annual redd count surveys for westslope cutthroat trout and bull trout
- Conduct annual population estimates for all species present.
- Describe age and size structures and life history strategies of sampled populations; (1997 surveys suggested that there was exceptional cutthroat trout growth rates and that there may be a resident bull trout population above a barrier. This would be the first documented resident bull trout population in the basin and of regional significance)
- Population status and trends over a 5 to 10 year period will allow comparisons to future levels and assessment of Project impacts.
  - Conduct redd count surveys for cutthroat trout and bull trout
  - Conduct juvenile population estimates in rearing areas
- Determine baseline levels of toxins in fish tissues and conduct laboratory studies to assess species sensitivity to potential mining wastes. Refer to the last section of these recommendations for further discussion of this issue.
- Locate the adult bull trout staging areas in the mine vicinity and downstream in the Flathead and Wigwam rivers and their tributaries. Adult bull trout will remain in rivers for extended periods prior to tributary spawning, making them susceptible to impacts from mining pollutants. These staging areas need to be identified to assess potential impacts.
- Determine fish use of the Flathead and Wigwam rivers and their tributaries. In addition to bull trout staging, adult bull trout and westslope cutthroat trout use the Flathead, Wigwam and Elk rivers; some may reside there for their entire lives. Also, juvenile trout use these waters for rearing and migrations. The knowledge of the extent of these uses and what proportion of populations may be affected by the Project needs to be quantified to assess potential impacts.
- Genetic analysis of westslope cutthroat trout in the immediate area and other tributaries is required to understand which species may be impacted and the status of native fish populations.
- River creel surveys in the Flathead and Wigwam rivers are required to assess potential impacts to fisheries and economic impacts to local communities. Likewise, creel surveys on Flathead Lake and Lake Kootenai are required to assess potential impacts to those fisheries and associated economies.

Availability and Quality of spawning and winter habitats in the Flathead and Wigwam rivers and their tributaries:

- Measure sediment size composition in spawning gravels to assess habitat quality and reproductive success of trout populations.
  - Substrate coring
- Identify and quantify existing point and non-point source sediment sources.
  - Road drainage surveys including mapping old roads and trails
  - Sediment source surveys
  - Map and date past timber harvests
  - Describe the hydrographs for the upper Flathead and Wigwam rivers.

- Determine current level and rates for alga growth in the Flathead and Wigwam rivers and site-specific tributaries.
- Delineate and map groundwater upwelling areas and correlate with documented spawning areas.
  - Infrared aerial mapping of thermal differences during winter
- Determine the groundwater regime in trout spawning and winter habitats; groundwater movement patterns and volume.
- Determine DO levels and temperature regimes in groundwater in trout spawning and winter habitats. The above groundwater characteristics are required to determine suitability, use and current conditions of these habitats and will allow for comparisons to future conditions.

#### Availability and Quality of rearing habitat in the Flathead and Wigwam rivers and their tributaries:

- Determine sediment size composition and embeddedness to determine juvenile bull trout rearing habitat quality.
  - Substrate scoring
- Describe the abundance of pools and large wood debris to evaluate trout rearing habitat quality.
  - Stream habitat availability surveys such as “R1/R4 surveys”.
- Delineate and determine groundwater characteristics mentioned above.
- Determine species distribution and relative abundances of alga growth and macroinvertebrate populations. Specific insect species are good indicators of contamination levels due to their sensitivities and tolerances of specific pollutants.

#### Selenium Levels in Aquatic Biota in the Flathead and Wigwam rivers and their tributaries:

- A 1998 report, Selenium Mobilization from Surface Coal Mining in the Elk River Basin, British Columbia: A Survey of Water, Sediment and Biota (McDonald and Strosher) from the Ministry of Environment, Lands and Parks, Kootenay Region, British Columbia, found elevated levels of selenium in water, sediments, and aquatic life including westslope cutthroat trout downstream of coal mining in the Elk River Drainage and recommended additional studies to further investigate selenium impacts. These recommended studies would provide baseline information on impacts to westslope cutthroat trout, side-channel wetlands, aquatic birds, and Lake Kootenay and on release mechanisms responsible for high selenium concentrations. These issues should be revisited and considered in the draft TOR. In addition, the original study is now 10 years old and should be repeated. There is the need to assess cumulative impacts of additional selenium mobilization from the proposed mining operations in the Lodgepole Creek Drainage and the associated impacts to the Elk River and Lake Kootenay. For the Flathead Basin, a baseline study is needed to assess current selenium levels in water, sediments and aquatic biota. The above

study recommended the following additional studies, some or all of these may have since been conducted:

- Compare the frequency of embryonic mortalities and deformities in a westslope cutthroat trout reference site with those in areas with high selenium exposure, below coal mines.
- Thoroughly evaluate selenium bioaccumulation in side-channel wetlands in the Elk Valley.
- Survey selenium bioaccumulation and toxic effects in aquatic birds in the Elk Valley.
- Survey the bioaccumulation of selenium in the zooplankton and fish communities in Lake Koocanusa, which receives selenium discharge from the Elk River.
- Investigate the geochemical mechanism and current rock dump reclamation practices responsible for the release of selenium into surface waters from coal mining.

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**April 11, 2006 United States Department of the Interior, National Park Service, Glacier National Park, RE: *Lodgepole Project Working Group Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act***



United States Department of the Interior

NATIONAL PARK SERVICE

Glacier National Park

West Glacier, Montana 59936

N3619

April 11, 2006

Mr. Garry Alexander  
Director, Strategic Policy and Planning  
Environmental Assessment Office  
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PO Box 9426 Stn Prov Govt  
Victoria BC V8W 0V1  
CANADA

**Re: Draft Terms of Reference – Lodgepole Project for Cline Mining Corporation’s Application for an Environmental Assessment Certificate pursuant to the British Columbia Environmental Assessment Act**

Dear Mr. Alexander:

Thank you for inviting Glacier National Park to participate in the Lodgepole Project Working Group Meeting on March 28, 2006 in Cranbrook. The park also appreciated the briefing that you and Margaret Bakelaar provided to United States participants on the evening of March 27.

As the attached comments on the draft Terms of Reference demonstrate, coal and other industrial developments in British Columbia’s Flathead drainage raise serious environmental and socioeconomic concerns to those of us charged with managing lands downstream.

Glacier National Park’s comments on the draft Terms of Reference are not inclusive of those that will be submitted by other state and federal agencies, many of which have specific expertise not duplicated by Glacier National Park.

In commenting on the draft Terms of Reference, the park did not have the benefit of being able to review Cline’s proposed mine plan. It was our understanding that Cline would provide this plan to all those who attended the Working Group meeting on March 28 so that it could be reviewed before the April 12 deadline for submitting comments.

Brace Hayden, Regional Issues Specialist, is the park’s principle contact with regards to our review of the Draft Terms of Reference. Brace can be contacted at [brace\\_hayden@nps.gov](mailto:brace_hayden@nps.gov) and (406) 888-7913.

Thank you for the opportunity to comment. We look forward to continuing to work with your agency on Cline’s Lodgepole proposal.

Sincerely,

Michael O. Holm  
Superintendent

Attachments

cc:

Margaret Bakelaar, Senior Program Officer, 320-757 West Hastings Street, Sinclair Centre, Vancouver, BC V6C 1A1 CANADA

Rich Moy , Chief, Water Management Bureau, Montana Dept of Natural Resources and Conservation, 1424 9<sup>th</sup> Ave., Helena, MT 59620

**Glacier National Park Comments**  
**Draft Terms of Reference - Lodgepole Project**  
**April 10, 2006**

Section 1.7 Lodgepole Project Team

It is stated that baseline study requirements will not be described in the Terms of Reference (TOR) but rather will be a part of Cline's application after appropriate consultation with government agencies, etc. How will the content, duration, and scope of the various baseline study requirements be determined and who will make such determinations? Is this something that will be delegated to technical working groups described at the March 28 meeting in Cranbrook

Baseline study requirements are extremely important from a transboundary perspective (i.e. fisheries, water quality, and wildlife) and from the standpoint of assessing cumulative impacts.

The TOR should describe the involvement of Canadian Federal Government agencies in reviewing Cline's application. Which of the C.E.E.A "triggers" that cause the involvement of Canadian Federal agencies are relevant to the Cline application? This section might also discuss the harmonization agreement regarding how the Provincial EA process and the Federal CEAA process will be dovetailed.

Section 3.1 Project Background and Rationale (also sections 3.2, 3.4 etc)

The description of the project area should include figures on the estimated hectares of ground disturbance that will be required for the various project alternatives.

Section 4.11 Wildlife and Fisheries Protection Plan

This section should also include plans for protection of wildlife and fisheries habitat during mining, processing and transportation activities.

Section 6.1 Overview of Effects Assessment Approach and Methods

Where are we from a time standpoint with regards to scoping? Is a listing of agency and non agency contacts being assembled? How much longer will scoping comments be accepted?

Vegetation should be addressed in a separate section from wildlife as the wildlife section in CMC's application is likely to be extensive. It is more common to combine vegetation and soils into one section although in this case it is not recommended.

### Section 6.3 Cumulative Environmental Effects

The application should include an assessment of the cumulative effects of adding CMC's Lodgepole Project to other existing and proposed activities in the Flathead and Elk drainages. In the Flathead drainage such activities include the possibility of additional coal mine development in BC (Lillyburt), proposed coal bed methane development in BC, and timber harvest activities in both MT and BC.

Study area boundaries for such parameters as water quality, wildlife, and socioeconomics should extend to the south of the international border and include Glacier National Park.

### Section 8.0 Water Quality and Aquatic Fish Resources

This section should include a summary of existing water quality and fisheries data for the project area as well as for the broader transboundary Flathead drainage (citations for these studies should be provided). Included in this summary should be the findings of the International Joint Commission's Flathead River International Study Board Report (1989) and the reports of its four technical committees, one subcommittee and one task force. This section should also discuss new studies and monitoring efforts that have or will be initiated as a result of CMC's application.

The US National Park Service is preparing to fund a study of the impacts of hydrocarbon development in the British Columbia Flathead. This study will assess impacts to water quality, sedimentation, and river corridor habitats and would look specifically at such issues as coal seam geochemistry. This study's principal investigator is Dr. Richard Hauer, Professor of Limnology at the Flathead Lake Biological Station. The estimated funding level is \$100,000 (US). Field work is scheduled to commence in the spring of 2006. Attached is a copy of Dr. Hauer's proposal (*Potential Effects of Canadian Resource Development on Glacier National Park*).

The US Geological Survey and US National Park Service have also proposed funding of a baseline assessment of water quality and aquatic communities of the North Fork of the Flathead River in order to document conditions in the watershed before industrialization occurs. Funding for this assessment is currently being sought. A copy of the study proposal is attached (*Baseline Assessment of Water Quality and Aquatic Communities of the North Fork of the Flathead River*).

Lastly, The National Park Service is finalizing an Inventory and Monitoring program that includes a park wide assessment of selected streams in Glacier National Park. The initial focus of such monitoring would be on streams that enter the Flathead drainage. A "straw man" draft of this water quality assessment was discussed at the Flathead drainage Science Conference that was held at park headquarters in the fall of 2005. Attached is a current draft of this study proposal (*North Fork of the Flathead Basin: ROMN Stream Protocol Development and Pilot Project*). When this study design is finalized, copies will be provided to the BC Environmental Assessment Office, the Canadian Environmental Assessment Agency, and to Cline Mining.

## Sections 8.2.2 Baseline Conditions – Water Quality and Aquatic Resources

In the Flathead drainage, a description of baseline conditions should extend at least as far south as the international border.

## Section 8.2.3 Assessment of Potential Effects, Mitigation Measures, and Residual Effects – Water quality and Aquatic Resources

Similarly, the assessment of potential impacts should extend at least as far south as the international border.

The T.O.R. needs to include an annotated bibliography of existing studies, so as to help ensure that these are utilized as Cline develops its application. Glacier National Park can help assemble such existing information.

## Section 10 – Vegetation and Wildlife

Vegetation should be a separate section from wildlife as the wildlife section is likely to be extensive and it would be difficult to address vegetation in the same section.

Wildlife impacts from this mine would likely be felt not only in British Columbia, but in Alberta and Montana as well. The T.O.R needs to thoroughly describe the international aspects of wildlife movements in the Flathead drainage. In the past 12 years no fewer than 6 graduate student studies (both MS and PhD) have been completed that document movements of elk, mule deer, moose and wolves between the Montana and BC portions of the Flathead drainage. In addition, Canadian researcher, Bruce McLellan has documented grizzly bear movements back and forth across the international border and across the continental divide (Waterton N. Park). Diane Boyd's wolf research during the 1990's documented utilization of the Foisey Creek drainage by both wolves and elk. All such existing wildlife information needs to be carefully laid out and then evaluated from a mine impact standpoint as well as from a cumulative effects standpoint.

Considerable effort needs to be expended to document what is already known about such transborder wildlife movements and to then assess the impacts of the industrialization that Cline's proposal represents in this largely undeveloped valley

Bibliographies of past research and other data collections exist. In addition, some authors have summarized exiting wildlife data in reports such as John Weaver's *The Transboundary Flathead – a Critical landscape for Carnivores in the Rocky Mountains*.

A baseline description is needed for vegetation, as well as for wildlife—one reason it would work better to separate the two sections. Are the plant communities intact, or have they been disturbed by humans? What is the level of weed species present? What percentage of the surrounding region is pristine vs. disturbed? Conduct and include data from surveys for rare species throughout the area proposed for disturbance. These should



be conducted in spring, summer, and fall for plants (e.g May, July, September depending on local phenology), and should include all seasons for wildlife (possibly monthly surveys).

Vegetation samples should be collected and assayed for baseline conditions, so comparison monitoring can detect changes in vegetation due to potential pollutants. Baseline surveys should also describe current community composition and diversity of vegetation communities (by type) prior to disturbance.

If rare or sensitive communities or habitat types are included in the project area, describe their extent both in the project area and in the region, and list how impacts to these communities would be prevented or mitigated.

A section should also be included which describes the cumulative impact of past, present, and reasonably foreseeable activities. What has been the impact on vegetation caused by the 36 drill holes, 875 meters of surface trenching, local logging operations, and other past activities? What projects besides this are currently occurring in the area, and what are other projects are in planning stages? What is the overall impact of all of these activities when combined with the proposal? Cumulative effects should be addressed for all discussion topics.

### Section 13 – Land Use

This section (and perhaps in Section 15 as well) needs to provide a thorough review and impact assessment of land use planning in both the BC and Montana portions of the transboundary Flathead drainage. Please see the attached documents prepared by US officials:

*North Fork of the Flathead Conceptual Strategy (1992)*

*Points Montana and the United States would like British Columbia to consider in its new planning process for the Flathead River Basin (2002)*

The wide range of protections afforded this valley in the US (statutes, special designations, zoning ordinances, etc.) are designed to protect the drainages near pristine ecosystem. The International Joint Commission acknowledged such efforts in 1988 in its report entitled: *Impacts of a Proposed Coal Mine in the Flathead River Basin*. The IJC specifically called for a strong, binational planning effort and recommended:

*The Governments consider, with appropriate jurisdictions, opportunities for defining and implementing compatible, equitable and sustainable development activities and management strategies in the upper Flathead River Basin.*

To date, no such international, basin wide planning effort has occurred. This is despite repeated efforts to initiate such a process on the part of governmental officials in Montana and the United States. Given the importance of this drainages resources and the

threats there to on both sides of the border, the need for such a planning effort is great, especially given the submittal of the Cline application.

#### Section 14 – Socioeconomic Considerations

The TOR does not address the need to assess economic or social valuation of wildlife and habitat impacts relative to the development. What will be the costs of lost hunting/fishing/trapping/viewing opportunities to local economies?

This section should also discuss impacts to the state of Montana and in particular to the Flathead drainage south of the International border. The Flathead River (called the North Fork of the Flathead River in the US.) forms the western boundary of Glacier National Park. This valley is renowned for its wild character, its beauty, its remoteness and its abundant wildlife. All such characteristics carry with them real economic benefits to the Montana's Flathead County and in a broader sense to the entire State of Montana. Similarly, the section on socioeconomics should discuss impacts to the Province of Alberta and in particular to Waterton Lakes National Park which is located just across the continental divide from the Flathead River of BC.

#### Section 15 – Socio-Community, Socioeconomic, & Health

The scope of the assessment should be expanded to include lower portions of the transboundary Flathead drainage including Glacier National Park and other areas south of the International border. Regional communities such as Columbia Falls and Kalispell MT should be included in the assessment.

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***April 14, 2006 Office of the Governor, State of Montana, RE: Lodgepole Project Draft Terms of Reference for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act***

April 14, 2006  
Garry Alexander  
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CANADA

*Re: Lodgepole Project Draft Terms of Reference for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act*

Dear Mr. Alexander,

Thank you for allowing the State of Montana, the Confederated Salish and Kootenai Tribes, Flathead Basin Commission and various federal agencies to participate in your regulatory process regarding the proposed Cline Mine project in the Foisey/Lodgepole tributaries of the Elk and Flathead Rivers.

The following reflects the comments of the Montana Department of Environmental Quality, Department of Natural Resources and Conservation and the Department of Fish, Wildlife and Parks. Comments from the Flathead Basin Commission and the U.S. Environmental Protection Agency are also included herein.

After extensive review of the *Lodgepole Project draft Terms of Reference (TOR) for the Cline Mining Corporation's Application for and Environmental Assessment Certificate*, the above listed State and Federal agencies are concerned that the draft TOR, as currently written, contains insufficient information to adequately assess the environmental and socio-economic impacts of the proposed Cline Foisey/Lodgepole mine.

The Montana reviewing committee is also concerned that the timeline proposed by Cline Mining Corporation does not allow for a comprehensive environmental review, sufficient to evaluate the magnitude of the potential impacts of the proposed mine. As stated at the Working Group meeting on March 28, 2006, Cline intends to be in full production by December, 2007. Given the breadth of data collection required to attain a comprehensive baseline and scientific understanding of the potential impacts, the proposed timeline does not ensure that the socio-economic and environmental impacts of the proposed mine will be adequately assessed.

Due to the lack of information in the TOR, including the lack of an adequate summary of the proposed project, the reviewing agencies found it difficult to provide detailed and constructive comments. Given this, the State and Federal governments request the opportunity to review a second draft of the TOR before Cline Mining Corporation enters the Application stage of the Environmental Assessment process.

With respect to baseline data collection, the reviewing committee referred to the extensive documentation contained in the Flathead River International Study Board reports (1988), resulting from the Sage Creek Coal Mine reference to the International Joint Commission. The Committee Technical Reports, based on over three years of intensive analysis by a bi-national team of fifty scientists, provided a critical starting point in determining baseline and impact assessment data for the proposed Cline Mine in the Foisey/Lodgepole drainages.

As you know, the State of Montana has been pursuing the collection of these data and other baseline data needs with British Columbia since 1988 when the IJC made its recommendations, but without success.

Since it is difficult to define the data needs without a clear understanding of the proposed mine design, construction, operations and reclamation, we may be missing some areas of

impacts. However, based on our experience with large coal mines and the proposed Sage Creek coal mine at Cabin Creek, the following are the types of data that will be required for this project and the generic types of methodologies that will need to be deployed.

Rich Moy, Chair of the Flathead Basin Commission and Chief of the Water Bureau for Montana's Department of Resources and Conservation is the principle contact with regards to our review of the Draft Terms of Reference.

Thank you again for the opportunity to participate in the Environmental Assessment process, and for consideration of our comments.

Sincerely,

Hal Harper  
Chief Policy Advisor to Governor Brian Schweitzer

Attachment

CC:

Margaret Bakelaar, Senior Program Officer, 320-757 West Hastings Street, Sinclair Centre, Vancouver, BC V6C 1A1 CANADA

Rich Moy, Chief, Water Management Bureau, Montana Department of Natural Resources and Conservation, 1424 9<sup>th</sup> Ave., Helena, MT 59620

**State of Montana Comments  
Draft Terms of Reference – Cline Mining Corporation Lodgepole Project  
April 12, 2006**

**Findings from the 1988 Flathead River International Study Board Reports to the International Joint Commission that are relevant to the proposed Cline Lodgepole Project**

After three years of intensive evaluation and assessment by a bi-national group of 50 U.S. and Canadian scientists, the *Flathead River International Study: Board Supplementary Report* to the IJC in 1988 stated: "It became apparent during the impact assessment phase that the available data were often inadequate, and that an improved database was required before confident predictions could be made about the likely impacts of the proposed mine" (p. 3). The report goes on to state: "The information needed for confident prediction of impacts of the mine is substantially the same as that needed to determine necessary mitigative measures and to assess their effects." The report states further: "Data deficiencies of major concern include those describing ground water, sediment, nitrate and ammonia, nutrients, and various components of the biota including fish." Baseline and data assessment for the Sage Creek Coal mine did not include wildlife such as carnivores, ungulates, amphibians, reptiles and bird species nor important vegetative and riparian habitats of the transboundary Flathead.

In the 1988 Supplemental Report to the IJC, the following physical studies were identified for defining mitigation measures and for conducting the assessment for the proposed Sage Creek coalmine. These studies are applicable to the proposed Cline mine site.

1. Quantify the ground-water systems(s) including flow rates, water levels, connection between aquifers, extent of tertiary materials along creeks, and existing ground-water contributions to surface flow, especially in critical spawning areas.
2. Assess ground-water quality and temperatures within the existing ground-water system.
3. Investigate the permeability of pond and ditch areas, overburden dump sites, and other disturbed areas to allow an assessment of potential infiltration to ground water.
4. Obtain additional overburden analyses to assess any impacts for leaching of waste dumps.
5. Design and implement a water quality-sampling program at ground-water discharge points at existing mines in the Elk River valley. This information could be used to assess impacts at the mine site.
6. Conduct mapping and sampling to identify and locate phosphorus-rich geologic units.
7. Determine the sediment concentrations, loads, and carrying capacities of the various creeks, and the Flathead River at the International Boundary. Use the results to refine the assessment of sediment impacts and of design of control processes.
8. Assess those water quality parameters that may be affected by the proposed mine. They include: concentrations of dissolved oxygen; temperature; concentrations and loads of total, particulate, and soluble reactive phosphorus; and compound of nitrogen. At the International Boundary, assess the seasonal levels of the metals aluminum, barium, cadmium, chromium, mercury, and lead.

To address biological data needs to mitigate the impacts on fish habitats and fish populations, especially bull trout, two approaches were offered for mitigation: on-site and off-site impacts at the Sage Creek site.

On-site:

1. Assess the biophysical characteristics of those streams that are impacted by the mine and the Flathead River, which will be directly affected by the mine. This would include:
  - a. A description of the physical characteristics of fish habitats along the inhabited reaches of the streams including a determination of their relationship to ground-water sources;
  - b. A determination of the abundance and diversity of algae and aquatic invertebrates above and below the mine site;

- c. A determination of the seasonal distribution of egg deposition, and of young-of-the-year, older juveniles, and adults of bull trout and cutthroat trout in relation to habitat type and, especially, ground-water influences;
  - d. A detailed study of the characteristics of typical spawning sites of major species including such factors as water velocity and depth, substrate characteristics, intra-gravel water quality, and relationship to cover; and
  - e. A study of fish production, including enumeration of spawning escapements, egg-to-fry survival, the densities of various life history states, and the production of downstream migrant juveniles.
2. Review the literature to determine what is known of the habitat requirements of various life history stages of bull trout and cutthroat trout, and the kinds of habitat improvements and habitat enhancement structures which might be appropriate for the study area creeks.
  3. Conduct field studies to fill in the data gaps identified in 2 above.
  4. Determine whether the bull trout populations in the mine site streams are genetically unique.
  5. Identify factors controlling algal growth rates and standing crop in streams of the mine site area, and the Flathead River down to Flathead Lake.

Off-site:

1. Monitor spawning escapement of adult bull trout in those creeks that are impacted by the mine site in relation to other tributary streams of the Flathead River in Canada, the North Fork Flathead River and Flathead River in Montana.
2. Determine the extent of interchange of bull trout among Howell, Cabin and Couldrey Creeks, and other tributary streams of the Flathead River system.
3. Determine what opportunities exist for habitat enhancement in adjacent tributaries.
4. Determine whether Howell Creek bull trout can be imprinted to home to adjacent tributary streams.
5. Evaluate the success of hatchery production and survival of stocked bull trout in the Arrow Lakes, B.C. as a model for the Flathead system.

## ***Terms of Reference***

The following are our comments on the draft Terms of Reference:

1. The TOR must include a detailed description of the proposed project, in which all elements of the proposed mine are described. This information is essential for defining the effluent discharge from the mine site and needs to include the following:
  - Technical information (design and dimensions) on settling ponds and waste dumps.
  - Geophysical properties of the mine site.
  - Location of settling and/or tailings ponds (including alternates).
  - Location of waste dumps (including alternates)
  - Dimensions of buffer strips

- Location of contaminated and uncontaminated ditches around the mine and waste sites
- Details on the road upgrade for the coal haul from the mine to Elko
- Storage of explosives on site.
- Multiple maps visually displaying the layout of the mine and all related infrastructure.

2. The study area for collection and assessment of baseline chemical, physical, biological and socio-economic data needs to be clearly defined in the TOR.

3. The Cline Mining Corp. Lodgepole Project study area must include the entire extent of the Flathead River drainage from the site of the mine to the outlet of the river in Flathead Lake. For example, bull trout spawning in the vicinity of the proposed mine are part of the same population of bull trout that occur in Flathead Lake within the State of Montana. Carnivores and ungulates migrate back and forth across the international boundary. Water quality changes in the vicinity of the proposed mine site could clearly impact waters of the United States.

4. The study area also must include the haul road from the mine to the proposed load-out facility at Elko. As proposed, the haul road will cross or come in close proximity to the following water bodies: North Lodgepole Creek, Lodgepole Creek, Morrissey Creek, the Elk River, and several unnamed tributaries, all of which need to be included in the scope of the Project study area. Since upgrades to this roadway and increased traffic have the potential to impact all of these waters, it is recommended that baseline water quality data (chemical, physical, and biological) and surface water hydrology data be collected at representative sites in all of these waters.

5. The TOR lack site-specific details regarding methods or approach to data collection. For example, the duration and frequency of the baseline water quality study is not adequately defined. A minimum of three years of data, ideally including wet, dry, and “normal” years is necessary to adequately characterize water quality conditions. Both the duration of the baseline water quality study and the frequency of sampling need to be defined.

6. The TOR are largely inadequate in terms of the type of groundwater data that will need to be collected at the mine site to address environmental concerns. The TOR needs to include a thorough assessment of subsurface water conditions and evaluation of groundwater discharge to Crab Creek (and its contribution to base flow of Crab Creek and Foisey Creek). The level of effort by Cline Mining to address the assessment of potential effects, mitigation measures, and residual effects (section 8.2.3) of the TOR is especially critical to address potential impacts to the Flathead River and its tributaries. Review of the February 22, 2006 Technical Report does not include the type of detailed groundwater evaluation required to achieve this effort.

7. The TOR must include a Canadian federal review under the Canadian Environmental Assessment Act and the environmental assessment must address cumulative impacts and transboundary impacts. The proposed mine triggers Section 47 of the CEAA, which, “Allows a foreign state or subdivision thereof (ie; the State of Montana) to initiate this reference through a request to the Canadian Minister of the Environment based on concerns that developments in one country will negatively impact another.”

8. The TOR must include a Cumulative Effects Analysis (CEA) component. This needs to include any other reasonably foreseeable coal mining or mineral exploration projects (ie; the Lilyburt proposal) as well as existing activities within the Flathead and Elk River watersheds, such as forest harvest, road construction, and recreational and outfitter use, that may contribute additional impacts to each biophysical/environmental component.

9. Based on information obtained during the March 28, 2006 Working Group meeting, traffic may increase substantially on the haul road between the mine site and Elko (3 trucks/hour, 24 hours/day). The TOR need to specifically identify this issue and propose a study approach to assess potential impacts to wildlife.

10. With respect to wildlife, at the March 28, 2006 meeting of the Working Group, it was stated that 9 sites were visited in January of 2006 to assess the presence of forest carnivores. Since neither wolverine nor lynx were detected in this survey, no additional work was planned. Similarly, surveys for Harlequin Ducks consisted of a single survey on July 30, 2005 in which a helicopter was used to fly the Wigwam River, Lodgepole Creek and North Lodgepole Creek.

This type of data collection is inadequate and provides only a snapshot of baseline conditions. Surveys for detecting tracks of forest carnivores, especially those that may occur in low densities like wolverines, fisher and lynx, need to be conducted by systematically following linear routes many miles in length, several times per year to account for changes in snow conditions, seasonal changes in habitat use, and other variables.

The following comments apply to specific sections of the draft TOR:

### **3.0: PROJECT DESCRIPTION**

- The draft TOR need to contain specific Project information, such as a detailed mine plan, water management, haul routes, road construction and project schedules, needed to identify which issues and information should be addressed and required in the Application.
- The draft TOR states that it will describe the Project in sufficient detail to allow a meaningful assessment of the Project effects. Until “...all key project components and activities [are] clearly identified and explained...” it will not be possible to identify all issues and information needs.



### **3.1: PROJECT BACKGROUND AND RATIONALE**

The draft TOR lists components of the Application, including an analysis of alternatives.

- One alternative that should be considered is the “no action” alternative, including evaluation of other potential uses for the area.
- This evaluation needs to consider environmental, social and economic values of the other uses in relation to the anticipated impacts of the Project.

### **4.11: WILDLIFE AND FISHERIES PROTECTION PLAN**

- The draft TOR notes that a Fisheries Protection Plan will be provided if there is a requirement for CMC to provide on-going mitigation for stream flows or for fish habitat compensation:
  - What are the criteria for requirement of a Fisheries Protection Plan?
  - Will one be required for the Project?
- There are migratory bull trout and westslope cutthroat trout that use the immediate project site in both the Flathead River and Lodgepole Creek. Bull trout are listed as Threatened under the United States Endangered Species Act (ESA) and westslope cutthroat trout have been petitioned for listing.
- Bull trout in the Elk River/Lake Koocanusa are currently strong populations that provide valuable recreational fisheries. At this time, both species in the Flathead Basin are considered weak stocks and angler harvest is not permitted. In the Flathead, both species were at higher levels in the late 1980’s, when the coal mine in the Cabin Creek drainage was proposed.
- The Flathead Basin westslope cutthroat trout and bull trout populations influence the ESA designation for these species. Bull trout were listed in 1998 largely due to the documented declines in the Flathead Basin populations.
- Further declines in population status will influence the future status assessments for the species across their range and affect the ability of western United States to de-list bull trout and relieve regulatory constraints.

### **4.4 WATER MANAGEMENT PLAN**

- The TOR need to include designs of the sediment ponds, spillways and ditches based on the design event(s) chosen or required for sediment drainage and control.

### **4.5 ML/ARD PREVENTION, MANAGEMENT AND MONITORING PLAN**

- Geochemical characterization approach and methods needs to include paste extract analysis for electrical conductivity (EC), major cations and anions
- The TOR need to include description methods for rock and waste sample collection and preparation.

#### **4.12.2 MINE**

- The TOR need to include a detailed final reclamation and decommissioning plan (rather than a conceptual plan), including a post-mining topography map (1" = 200 or 300 meters with a 3-4 meter contour interval), identified seismic and static safety factor analysis
- The TOR need to include objectives for waste dumps and reclamation plans for Crab Creek and the Lodgepole drainages

#### **5.0 RISK ASSESSMENT AND MANAGMENT:**

- The draft TOR states that there will be risk assessments conducted on various aspects of the Project.  
Upon what information or databases will this be conducted?
- *In the Flathead River International Study: Board Report* under the International Joint Commission (IJC) 1988, the Board encountered two major problems with the terms of reference;
  - 1.) Conceptual level of design was not adequate to develop reliable, quantitative predictions of impacts on water quality, quantity and biological resources;
  - 2.) Baseline data required to assess impacts were not adequate requiring professional judgment, not data, to form conclusions.
- To address this concern, the TOR need to include a basin-wide comprehensive and quantitative baseline assessment of aquatic resources in both the Flathead and Wigwam river systems, including Flathead Lake and Lake Koocanusa used by the migratory trout.

#### **6.0 OVERVIEW OF EFFECTS ASSESSMENT AND APPROACH METHODS:**

- Effects assessments need to include cross-border effects, eg., hydrology, aquatic resources, vegetation and wildlife (including Threatened and Endangered species, and species of special concern in the U.S. and Montana, First Nations communities, land use, and cumulative effects).
- Study area boundaries need to include the entire Flathead River Basin, including the mining site-specific tributaries, the North Fork of the Flathead River, the main stem Flathead River and Flathead Lake. There is potential for project impacts to be observed in all four of these areas. Likewise the study area should include the Lodgepole Creek drainage, the Wigwam and Elk rivers, and Lake Koocanusa given that impacts from the Project extend to all of these areas.

#### **6.3 CUMULATIVE ENVIRONMENTAL EFFECTS**

- Project impacts to water quality, migratory fish and wildlife are concerns that encompass the Wigwam, Elk and transboundary Flathead basins.
- The Effects Assessment needs to be conducted at these scales in a basin-wide approach. In addition, a basin-wide approach to baseline information collection and assessment will allow CMC to determine Project impacts by

comparing aquatic conditions at the mine site to those in other tributaries, which will provide reference sections.

- This assessment needs to include social and economic impacts, such as those related to loss of fisheries in United State waters. For example, negative impacts to westslope cutthroat trout and bull trout could result in negative impacts to economies based on recreational fisheries in the Flathead Basin and in Lake Koocanusa. These economic impacts need to be addressed in the Effects Assessment.
- Quantify the cumulative impacts of the Cline Mine, proposed Lillyburt coalmine, proposed CBM developments and the gold mining proposal on air quality, wildlife populations and migratory patterns, water quality, including sediment, nutrients and heavy metals, water supply, fish and aquatic habitats in the transboundary Flathead River basin.
- Quantify the cumulative impacts of the Cline Mine, timber harvest and other changes in land use processes in the Wigwam drainage basin.
- Quantify the cumulative impacts of the above developments on the following federal and international designations: Glacier National Park, Waterton Lakes National Park, World Heritage site, Biosphere Reserve and the Wild and Scenic River of the NF of the Flathead.
- Quantify how existing land uses and practices within the transboundary Flathead and Wigwam drainage basins will change with the proposed developments described above.
- Cumulative effects analysis for wildlife needs to include an assessment of thresholds that may be reached when combined with other developments in the greater project area.

### 7.3 SURFACE WATER HYDROLOGY:

- The TOR need to include an assessment of the water drainage system for all existing roads and proposed road development, including small currently impassable roads used in past timber harvest operations.
- This section needs to address the increased efficiency of transporting rain and snowmelt waters across land to stream channels by these roads and the resulting impacts to channel morphology, sedimentation, and hydrology.
- Of significant importance is the upgrade and increased truck use on haul roads adjacent to Lodgepole Creek. Sedimentation will increase due to year round use by high numbers of large trucks. These sediments will be introduced into Lodgepole Creek and impact bull trout egg survival.
- The TOR need to include a comparison of the expected modified hydrograph of Lodgepole Creek with the existing hydrograph to assess impacts to channel morphology and sedimentation associated with channel changes. The pre-Project hydrograph must be well described to allow this comparison.

### **7.4.1 HYDROGEOLOGY BASELINE CONDITIONS**

- The TOR need to include an evaluation of the quantity and quality of groundwater contributions from potentially affected geologic strata to all nearby surface streams.
- This work needs to be conducted at a scale that thoroughly characterizes the hydrogeologic conditions of the material to be mined, demonstrating which portions of the material are saturated and estimates of the character and quantity of groundwater contributions from this material to base flow in proximate streams.

### **8.0 WATER QUALITY AND AQUATIC FISH RESOURCES**

- The study area for assessment of impacts to aquatic resources is limited to Foisey and Lodgepole creeks. An assessment at this scale would not include potential impacts to the North Fork of the Flathead River, the main stem Flathead River, and Flathead Lake and also the Wigwam and Elk rivers and Lake Koocanusa.
- The TOR need to include baseline conditions in not only Foisey and Lodgepole creeks, but also across the majority of these basins, including other important bull trout and cutthroat trout tributaries, downstream river sections and lakes, such as the North Fork and main stem Flathead River, and Flathead Lake.

### **8.2 WATER QUALITY (SURFACE WATER AND GROUNDWATER QUALITY)**

- The TOR need to include baseline data on water quality and flow during a high flow year, an average year and drought year at a number of sites at the mine site and downstream in both the Flathead and Wigwam drainage basin (minimum of three years of data.) Synoptic measurements for all parameters are important within each of the major watersheds.
- Water Quality samples need to be taken at least two or three times during the rising limb of the hydrograph, one at peak discharge and two or three measuring during the descending limb and at base flow in August/September and one in the Winter (January or February).
- Baseline water quality samples should be taken for the major nutrients, and metals for a minimum of three years.
- The parameters in the report presented on March 28 need to be tied to flow.
- Quantify the amount of explosives that will be used at the mine site and the amount of nitrogen that can be expected be released in effluent discharges from the mine site and downstream. Determine the effect of increased nitrogen releases on the increased growth of algae and the greening of the Flathead and Wigwam rivers.
- The TOR need to include continuous depth integrated sediment data throughout the basin and tied to the hydrograph during a low, average and high flow years and especially at peak discharge as up to 90 percent of sedimentation occurs during this period.

- Water Budget. The TOR need to include a complete water budget for the mine site. Water used for washing the coal, mine site pumping, used on the roads etc.
- Define the relationship between surface water and ground water and the effects of dewatering streams and the groundwater recharge zones in the tributaries of the Flathead River that could be affected.
- Quantify the groundwater chemistry within and downstream of the mine site and the effects on surface water flows.

### 8.2.3 ASSESSMENT OF POTENTIAL EFFECTS, MITIGATION MEASURES AND RESIDUAL EFFECTS

- The TOR need to include a detailed characterization of geotechnical influence on inflowing groundwater from residual nitrates from blasting materials.
- The assessment of water quality needs to include suspended solids and petroleum hydrocarbons (fuels, oils, lubricants, solvents, etc.).
- The Flathead River *Board Supplement Report* also defined a number of mitigation measures for groundwater related impacts, surface water related impacts, needed waste dumps and nutrient controls and others impacts that should be quantified and assessed at this mine site.

#### 8.3.1 FISHERIES BASELINE CONDITIONS:

- The document states that a baseline fisheries program will identify fish resources and describe biophysical habitat conditions in the three immediate tributaries to the Project and the Flathead River with reference to historical data sources and that the assessment will focus on fish presence, fish habitat, water quality and seasonal flows. Historic data sources include bull trout redd count surveys that describe redd numbers and locations of redds in Lodgepole Creek and the Flathead River.
- Fish presence and species distribution is an important fish step in assessing fishery resources, but provides limited information and does not prove absence. Generally, this type of information provides a snapshot in time of what was observed by the collector at that point in time. Fish presence information may change with the time of day, season-to-season, or year-to-year at any location in a stream.
- The TOR baseline fisheries data need to include more descriptive types of data designed to determine species abundance, seasonal migration patterns, habitat use by specific life stages, population status, and population demographics, such as genetic makeup, age structure and life history strategy.
- These types of fisheries information are needed to describe what fisheries resources exist in the Project area and be able to adequately assess potential impacts of the Project to these resources. Also, fish presence alone will not provide data to assess future changes to the fish populations.
- The TOR need to include a quantitative baseline data collection that incorporates spatial and temporal variation is needed to assess impacts to these fishery resources.

- The baseline collection needs to occur over a three to 10 year period to account for annual variation. In addition, assessing fish presence in only Foisey Creek and upper tributaries will not allow comparisons to fish populations in other portions of the basin. As stated in the above comments, the Project will impact fisheries in a much larger area than just the immediate tributaries.
- The Project would benefit from a comprehensive baseline data collection for fish populations throughout the Flathead Basin, Lodgepole Creek and the Elk River Drainage.
- In addition to the trout species, there are sculpin (Rocky Mountain and Columbia Mottled) in the Foisey/Lodgepole study area (Interior Reforestation.Ltd., 1997a,b). At this time there is little information describing the specie(s) distribution of sculpin in the Flathead River and tributaries.
- The TOR need to include a comprehensive study to determine which species of sculpin are present and may be impacted by the Project.
- The TOR need to include a distribution of sculpin species and an evaluation of the sensitivity of these species to mining pollutants. In some studies, sculpin are more sensitive to contaminants than trout. This relationship needs to be assessed for pollutants such as selenium and other mining wastes.
- The TOR fish habitat characterization needs to include techniques that assess specific seasonal habitats of each life stage. For example, spawning habitat should be assessed specifically to determine its quality by measuring fine sediment levels. Likewise, juvenile rearing habitat should be assessed for cover availability. Surveys should be designed to assess the critical habitat components that influence survival of the various life stages for each fish species.
- At this time, there is no documented use of tributaries to the Middle Fork of the Flathead River for spawning and rearing by westslope cutthroat trout from Flathead Lake. The Flathead Lake, North Fork and main stem Flathead River cutthroat trout fisheries appear solely dependent on westslope cutthroat trout production in the North Fork Flathead Drainage. Westslope cutthroat trout comprise the summer fishery in the North Fork and main stem reaches of the Flathead River. Numerous fishing guide services and equipment stores rely on these fisheries. An angler creel survey of these waters is needed to assess the potential impacts of the Project to these economies. Likewise, the westslope cutthroat trout and bull trout fisheries in Lodgepole Creek, the Wigwam and Elk rivers and Lake Koocanusa provide economic benefits to surrounding communities in both the US and British Columbia. An angler creel survey of these waters is needed to assess the potential impacts of the Project to these economies.
- A 1998 report, Selenium Mobilization from Surface Coal Mining in the Elk River Basin, British Columbia: A Survey of Water, Sediment and Biota (McDonald and Stroscher) from the Ministry of Environment, Lands and Parks, Kootenay Region, British Columbia, found elevated levels of selenium in water, sediments, and aquatic life including westslope cutthroat trout

downstream of coal mining in the Elk River Drainage and recommended additional studies to further investigate selenium impacts. These recommended studies would provide baseline information on impacts to westslope cutthroat trout, side-channel wetlands, aquatic birds, and Lake Koocanusa and on release mechanisms responsible for high selenium concentrations. These issues should be revisited and considered in the draft TOR. In addition, the study is now 10 years old and should be repeated. There is the need to assess cumulative impacts of additional selenium mobilization from the proposed mining operations in the Lodgepole Creek Drainage and the associated impacts to the Elk River and Lake Koocanusa fish populations.

#### 8.3.2 BENTHIC INVERTEBRATES AND PERIPHYTON:

- The TOR need to include a quantitative assessment that incorporates seasonal variation to assess impacts to these organisms.
- Baseline data need to be collected over a multiyear timeframe to address variation in population characteristics over time that may be due to diverse environmental conditions, such as the exceptionally high summer or fall stream flows in 2005.
- This needs to be conducted not only in the immediate three tributaries but also to all downstream waters, including reference reaches not impacted by the Project.
- The TOR need to include a basin-scale bioassessment (benthos and periphyton) assemblages and a quantitative physical habitat assessment via a statistically valid survey design.

#### 8.3.3 IMPACT ASSESSMENT:

- The TOR need to address impacts to fish populations and other aquatic biota throughout the Flathead and Kootenai basins, downstream of the Project.
- The TOR need to include a quantitative assessment that incorporates spatial and temporal variation to assess impacts to the fishery resources.
- Baseline fisheries data should be collected over a multiyear timeframe (three to 10 years) to address variation in fish population characteristics over time. This should be conducted not only in the immediate three tributaries but also in all downstream waters, including reference reaches not impacted by the Project.
- The TOR need to include a delineation of important fish habitats, such as spawning or over-wintering areas to understand the existing fishery resources and assess impacts of the Project. The assessment for benthic invertebrates should be approached in the same manner.
- Impact assessments need to incorporate monitoring and impact data from the Elk River mines, including the effects of any failures of structures such as sediment ponds and waste rock dumps.

#### 9.3 NOISE

- The draft TOR states that no baseline studies for noise are intended.

- Due to the wildlife values of the mine site, transboundary Flathead, and Lodepole/Wigwam, the TOR need to include baseline studies for noise and potential impacts to wildlife.

## 10.0 VEGETATION AND WILDLIFE

- The Vegetation and Wildlife sections need to be separated out into two distinct sections, each with their own baseline and impact assessment components.
- This section states that only habitats directly impacted by the mine's footprint, the load-out, the haul-out road, and the power line will be mapped and described.
- The TOR need to include a basin-wide assessment to better ascertain which habitats are rare and how this proposal may separate the connectivity of habitats.
- Given that this project will impact 2 large watersheds (the Elk and the Flathead), both should be mapped.
- John Weaver (2001) identified the Elko area and an area north of Fernie as potential linkage areas for grizzly bears to populations to the north and west of the project area. Areas important for linkage for grizzly bears invariably benefit most other mammalian species as well.

### 10.1.1 VEGETATION AND WILDLIFE BASELINE:

#### **Amphibians**

- The TOR need to include baseline data collection for all amphibian species in the Project area, tributaries not impacted by the Project, and the Flathead River.
- The TOR need to include a quantitative assessment for amphibian species that incorporates spatial and temporal variation .
- Baseline data for amphibians need to be collected over a multiyear timeframe to address variation in population characteristics and habitat used over time and across seasons.
- A simple one-time survey of any specific site will not provide reliable data to determine if amphibian species are absent from the site or what life stages potentially use the site seasonally.

#### **Wildlife**

- A number of large ungulate species and carnivores are known to summer and reproduce in the B.C. portion of the transboundary Flathead and winter in Waterton Lakes National Park and the lower portion of the Flathead basin within Glacier National Park, Flathead National Forest and the riparian corridor of the Flathead River.
- The TOR need to quantify the importance of the transboundary Flathead riparian corridor for wildlife species, periphyton, and physical and biological processes.



- The TOR need to quantify the migratory patterns of the large and mid-size carnivores as well as the large ungulate species.
- The TOR need to include data on the following mid-size carnivores: lynx, bobcat, wolverine, fisher,, badger, mink, river otters, and a number of large carnivores including wolves, grizzly bear, and mountain lion.
- The TOR need to include at least a three-year baseline data for the above species based on presence-absence inventories, demographic inventories and population trend analysis.
- The draft TOR states that a “wildlife” description and a “selected wildlife” suitability and capability mapping will be done only on areas directly impacted by this proposal. This needs to include both a local and basin-scale for both watersheds.
- Assuming that not every vertebrate species will be addressed, the TOR need to include a rigid and systematic survey consisting of small mammal trapping. It is very possible that species may be identified that were not known previously to occur in the area.
- In the case of lynx and wolverine, given their distribution throughout the Flathead drainage, there is absolutely no question that they use the project area and would be impacted by this proposed project. See Zielinski and Kucera (1995) for more detailed information on conducting surveys for forest carnivores.
- The TOR need to include track surveys to be conducted the entire length of the haul road for at least 3 years to better determine the locations of these primary points of crossing.

### **Birds**

- The TOR need to include thorough and systematic breeding bird surveys and should be conducted for a minimum of 3 years to better ascertain which species occur in the area.
- The TOR need to include territorial counts and egg shell sampling for the pileated woodpecker, water ouzel and Harlequin ducks.

### 10.1.2 IMPACT ASSESSMENT:

#### **Amphibians**

- Impacts to all amphibian species and their sensitivity to expected mine pollutants need to be assessed.
- The TOR need to include a quantitative and comprehensive baseline assessment of amphibian species distribution that incorporates spatial and temporal variation is needed to assess impacts to these organisms.

#### **Mammals**

- This section does not address impacts to wildlife beyond the immediate area. The draft TOR states that the predictions for impacts on wildlife will be based on the project footprint.

- The TOR need to include the haul route and entire transboundary Flathead basin. Impacts from noise and disturbance can be far-reaching and should be considered from a basin-wide approach. Again, one example would be the travel corridor/linkage zone identified by Weaver (2001) for grizzly bears south of Fernie.
- The TOR need to define the effects of this and the other proposed mines on fragmentation and encroachment on habitats of large carnivores and what this will do to population numbers and genetic variability. According to a 2005 study on grizzly bears by Proctor, et. al., “Genetic analysis reveals demographic fragmentation of grizzly bears yielding vulnerable and small populations.” They concluded that, “trans-border bear populations may be more threatened than previously thought and conservation efforts must be expanded to include international connectivity.”
- The TOR need to quantify the effects of the proposed mine and other proposed developments in the transboundary Flathead on fragmentation of the available habitat for importance wildlife species, especially in the Crown of the Continent eco-region.
- The TOR need to assess the changes in winter ranges of a number of species such as mountain goats and sheep.
- The TOR wildlife assessment needs to include the impacts and disturbances associated with the haul road. As stated on 3/28, a minimum of 6 large trucks will be passing over this road each hour of every day, 365 days of the year. This is one large truck every 10 minutes, year-round. This does not include the large number of vehicle trips involved with transporting personnel, services and equipment each day.
- There are other issues relative to the haul road that are important beyond its effect on population connectivity. Roadsides planted to clover or other palatable cover may attract some species of wildlife, making them vulnerable to being struck or killed by vehicles or to being illegally shot. Dead ungulates may attract bears or other scavengers, increasing their vulnerability to mortality as well. McLellan (1989) showed that grizzly bears inhabiting the Flathead had higher rates of mortality if they used habitats near open roads. Salt on roads during the winter months to control ice may act to attract ungulates as well, making them vulnerable to being struck by a vehicle.

## **11.0 AIR QUALITY**

- The TOR need to quantify the dust and particulate matter that will be released from the mine site and haul road and deposited in the Flathead and Wigwam rivers and tributaries. Define the impacts on water quality.
- The TOR need to quantify the impacts of dust and particulate matter in the lakes and air shed of Waterton Lakes National Park and Glacier National Parks. Both National Parks have Class 1 Air Quality standards.

### 15.1 SOCIO-COMMUNITY, SOCIO-ECONOMIC AND HEALTH:

- The scope of the detailed assessment must include the Flathead Basin in the United States, the Polebridge vicinity and the Flathead Valley including the Kalispell, Columbia Falls, and Whitefish vicinities and the Kootenai Basin in the United States, including Lake Koocanusa. There are potential impacts to these areas associated with degraded water quality and reduced migratory fish populations resulting from the Project.

#### 15.2.7: BUSINESSES:

- This section should examine the businesses associated with recreational fisheries in the Flathead and Kootenai basins and the potential impacts to these businesses by development of the Project. To assess the potential impacts from the Project, baseline data collection should include angler creel surveys to determine angler use and catch in the river and lake fisheries and estimated economic values of these fisheries.

#### ***Potential for Dump and settling pond failures***

- It was stated in the March 28<sup>th</sup> meeting at the St. Eugene Mission, B.C by one of the mine engineers that there would be dump failures at the Cline mine site. Please quantify the potential impacts that these dump failures will have on sedimentation, fisheries, and other ecological parameters.

#### **References:** (not all cited, relevant to TOR and Project Assessment)

Cope, R.S. and G.G. Oliver. Interior Reforestation Co. Ltd. Fish and Fish Habitat Inventory within Unlogged Watersheds – Upper Flathead River. Prepared for Crestbrook Forest Industries Ltd. April 1997. Prepared for the Ministry of Environment, Lands and Parks.

Deleray, M., L. Knotek, S. Rumsey, and T. Weaver. 1999. Flathead Lake and river fisheries status report. DJ Report No. F-78-R-1 through 5. Montana Fish, Wildlife & Parks, Kalispell.

Demarchi, R.A., Hartwig, C., and D. Phelps. 2003. Species at Risk Inventory Strategy for the Dominion Coal Block. Ecodomain Consulting.

Fraley, J. J. and B. B. Shepard. 1989. Life history, ecology and population status of migratory bull trout (*Salvelinus confluentus*) in the Flathead Lake and river system, Montana. Northwest Science 63:133-143.

Impacts of a Proposed Coal Mine in the Flathead River Basin, Board Supplementary Report. International Joint Commission, 1988.

Morris, K.J., R.S. Cope and L.P. Amos. Interior Reforestation Co. Ltd. [Fish and Fish Habitat Inventory for Select Tributaries of the Upper Flathead and Elk Rivers](#). Sept. 1997. Prepared for Crestbrook Forest Industries Ltd. Sparwood Division.

McLellan, Bruce N. 1989. Population dynamics of grizzly bears during a period of resource extraction development. *Canadian Journal of Zoology*. 67:1856-1860.

Muhlfeld, C.C., S. Glutting, R. Hunt, D. Daniels, M. Boyer, J. Wachsmuth, and B. Marotz. 2005a. Hungry Horse Mitigation Program, 2004 Annual Progress Report: Investigations of the Flathead River Native Species Project. BPA Project Number 199101903.

Muhlfeld, Clint C., and Brian Marotz. 2005b. Seasonal movement and habitat use by sub-adult bull trout in the upper Flathead River system, Montana. *North American Journal of Fisheries Management* 25:797-810.

Muhlfeld, C.C., B. Marotz, S. Thorrold, and J. Fitzgerald. 2005c. Geochemical signatures in scales record stream of origin in westslope cutthroat trout. *Transactions of the American Fisheries Society* 134:945-959.

Proctor, M.F., et.al., Genetic analysis reveals demographic fragmentation of grizzly bears yielding vulnerably small populations. 2005. *Proceedings of the Royal British Society*. 272, 2409-2416. Published on-line 20 September 2005.

Summit Environmental Consultants, March 31, 2004. Summary of existing baseline water quality data. Prepared for the British Columbia Ministry of Energy and Mines.

Weaver, John.L. The Transboundary Flathead: A Critical Landscape for Carnivores in the Rocky Mountains. The Wildlife Conservation Society, Working Papers No. 18, July 2001.

Weaver, T.M. 2005. Forest-wide fisheries monitoring Flathead. 2005 Annual Progress Report. Montana Fish, Wildlife and Parks.

Zielinski, William J. and Thomas E. Kucera. 1995. American marten, fisher, lynx, and wolverine: survey methods for their detection. Gen. Tech. Rep. PSW-GTR-157. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Dept. of Agriculture; 163 pp.

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**May 2, 2006 United States Department of the Interior, National Park Service RE: *Review of Cline Mining Corporation Lodgepole Coal Mine Proposal (File: "2005 LODGEPOLE Fisheries Draft Report (Updated March 11).doc")***

Re: Review of Cline Mining Corporation Lodgepole Coal Mine Proposal (File: "2005 LODGEPOLE Fisheries Draft Report (Updated March 11).doc")

Reviewed by:

Dr. E. William Schweiger

Ecologist, Rocky Mountain Inventory and Monitoring Network

National Park Service

The following comments offer a general review of the draft fisheries assessment by Cline Mining Corporation and/or its contractor (Cline) dated March 11<sup>th</sup>, 2006. Overall the assessment and Cline's protocols are incomplete and have some significant scientific and technical shortcomings. Given these problems, it is unlikely that the current description of baseline conditions is accurate or defensible.

The main problem with the approach taken by Cline is the lack of a statistically appropriate methodology for selecting sample sites (both in space and time) and generating inferences or predictions from these data. This applies to both the empirical data collected by Cline as well as the summarization of existing data generated by others within the likely affected watersheds. Section 3.5 of the report summarizes the key areas of potential impact from the mine and associated activities (sedimentation, nutrient inputs, road/bridge construction and operation/use, waste dumps, increased angling pressure, and alteration of groundwater input). While Cline's list is incomplete it still demonstrates the distributed, possibly cumulative effects on stream integrity that the mine and associated activities will create. A true baseline assessment of aquatic conditions and/or the fishery must incorporate either a robust survey design coupled with appropriate design-based inference and/or a well defended and supported model-based approach to generate loadings and flux. Cline does neither of these and therefore the data collected and summarized have no basis for generating confidence intervals or any other estimate of uncertainty in their results (statistics) or predicted conditions. While there may be limited value (see below) in Cline's general narrative summary of basin conditions and the site specific estimates via a pseudo experimental design (repeat visits after mining commences), they are glaringly insufficient given the scale of possible impact in the basin from mining activities.

Cline claims to use "representative" sites yet offers no methodology or defense of this site selection for either the close proximity reaches or the data and results compilation from the "broader study area". Given well known local and meso-scale spatial variability in stream physical habitat and biota (especially benthos and periphyton) the targeted site selection is likely inadequate and the true degree of representativeness is both unknown and unquantifiable. While water chemistry is probably better mixed (vs. habitat and biota) at the scale of the basin, this is an untested assumption and the study should acknowledge the uncertainty in extrapolating water quality data from point grab samples to unsampled locations. A correct approach would use both a survey (*sensu* the sample design developed by the US EPA Environmental Monitoring and Assessment Program (EMAP)) and a model-based protocol (such as that used by the USGS NAQWA program). Both of these programs couple the analytical (inference) methods to the sample design and can generate estimates of uncertainty.

The site level and specific analytical methods also have several problems:

1. Cline uses single or few index periods for sampling. For the physiochemistry measure this is clearly insufficient given the temporal variability of the hydrograph. Cline does not

even really offer a cogent defense of the time periods in which they sample. The flashiness of system is evident in Cline's failed September 2005 sample event.

2. The sample reach length of 100 meters may not be long enough (e.g., does it capture sufficient meander cycles?) and in general a fixed sampled reach size is inappropriate. Cline offers no defense of their chosen sampled length. While no sample objectives were really articulated by Cline, if we assume (for example) that Cline would like to capture at least 90% of the fish taxa in a sample reach, a large body of research suggests a sampled length closer to 40 times the mean wetted width would be preferred.
3. It is likely that the channel morphology and substrate methods are inadequate. Bedform and substrate type exhibit marked local spatial structure and more robust methods are needed to quantify this. The full suite of EMAP methods (in situ) or, where applicable, the remotely sensed channel and floodplain analyses advanced by the Flathead Lake Biological Station (FLBS) should be employed.
4. There is no attention given to the hyporheic zone. Cline's own (general narrative) results and significant research in other systems (e.g., by FLBS) clearly suggest that there are real and important ground water interactions occurring in these kinds of habitats. Therefore, a robust sampling of ground water systems (hydrology, water chemistry and hyporheic macroinvertebrates) is needed.
5. A Surber sampler is, depending on flow and depth characteristics of the sampled reach, potentially flawed. Many organisms likely floated past the net opening, thus Cline's benthos estimates are probably depauperate. The FLBS has a preferred protocol for the types of streams in the North Fork and Elk basins.
6. They need a citation that justifies the benthos sub-sampling and picking protocol. How many individuals were picked and identified? What percent of the total sample is this? Was a species-effort curve developed?
7. The exclusive use of a single diversity index (Shannon Wiener) to summarize the assemblage data is inadequate and inappropriate. There are much more informative multi metric indices and RIVPACS O/E models that have been developed for western BC, the State of MT and the Northern Rockies ecoregion for benthos and periphyton. These would resolve community responses much better. Cline's reasoning behind benthic diversity and equitability is simplistic and in lieu of more robust data on community composition in the study reaches and broader area, it is unknown if the community state described by Cline exists.
8. There was no literature cited section in the version of the document reviewed.

Finally, the results provided by Cline are insufficient and must be preliminary or incomplete in this draft of the report? There is no real enumeration (tables, etc.) of their results, no summary, or a report from the broader study area review? Cline provides narratives that are somewhat subjective. The description of stream morphology, LWD density, substrate types, etc. should be replaced with quantitative (repeatable) empirical data. The little numerical data that is provided does not even have simple estimates of variability (e.g., sample variances) and there is no indication that Cline recognizes the importance of the multiple components of variation that impact monitoring data and the subsequent power of statistics generated.

For all of these reasons (and likely others) the assessment by Cline Mining Corporation and/or its contractor is insufficient and will not provide an adequate baseline by which impacts of mining may be judged using a quantitative and statically valid approach.

Dr. E. William Schweiger  
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**May 4, 2006 Department of Natural Resources and Conservation, State of Montana, RE: *Lodgepole Project Working Group Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act***

May 4, 2006

Garry Alexander  
Director, Strategic Policy and Planning  
Environmental Assessment Office  
2<sup>nd</sup> Floor, 836 Yates Street  
PO Box 9426 Stn Prov Govt  
Victoria, B.C. V8W 0V1  
CANADA

*Re: Lodgepole Project Working Group for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act*

Dear Mr. Alexander:

Thank you again for facilitating Montana's participation in the regulatory process regarding the proposed Cline Mine project in the Foisey/Lodgepole drainages.

Following up on the subcommittee teleconferences and the first Working Group meeting, I have the following requests on behalf of the State of Montana:

- Could you please make available the entirety of the comments on the draft Terms of Reference submitted to the Environmental Assessment Office by the

participants of the Lodgepole Working Group. We are requesting these in addition to “Issues Tracking Document” to be compiled by the proponent.

In addition, could you please also clarify the following:

- Will Montana be included in the 30-day public comment period for the draft Terms of Reference?
- Could you please also clarify the timeline and process for determination of the Federal triggers for application of the Canadian Environmental Assessment Act (CEAA)?
- Based on the technical subcommittee calls, it appears that the proponent has only made a select number of studies available for review to the Working Group, while others have been referenced, but not distributed. This makes it difficult to comment on the complete content of the Terms of Reference, with respect to the extent of the research required by the proponent in order to receive an Environmental Assessment Certificate. Could you please clarify what is required of the proponent in this respect?

Finally, thank you for offering to coordinate a teleconference between the Province and the State in order to discuss and clarify regulatory standards and protocols, as applied to the Cline Mine Lodgepole/Foisey project. I will work with you on providing representation for that call.

Sincerely,

Rich Moy  
MT DNRC

Cc: Hal Harper  
Erin Sexton  
Brace Hayden  
Clayton Matt

---

**May 4, 2006 Montana Department of Fish, Wildlife and Parks, RE:**  
***Comments on the Scope of Work 2006: Fisheries and Aquatic Resources***  
***Assessment***

5/4/2006

***REF:MD026-06***

**TO:** Montana/CSKT Delegation of the Lodgepole Coal Mine working group

**FROM:** Mark Deleray



**SUBJECT:** MFWP Comments on Lodgepole Mine Scope of Work 2006:  
Fisheries and Aquatic Resource Assessment

I have reviewed the Scope of Work for 2006 and the following are my comments. Please include these as necessary with comments from other reviewers.

Sec 1.0 Introduction: It is stated that the baseline program will be increased for the "...purpose of evaluating and mitigating potential impacts associated with the project, and to provide a benchmark for future monitoring during operational, decommissioning and reclamation phases." It is my opinion that the proposed methodology and sampling strategy described in the 2006 Scope of Work will not provide quantitative or comprehensive data to fulfill the above purpose. MFWP reiterates our previous comments that the sampling design is too limited in scope and study area, insufficient in time frame, and is not statistically valid or defensible. Knowledge of existing resources is required in order to evaluate and mitigate for project impacts. Specifically for fisheries resources, presence and distribution of fish species, their life history, seasonal habitat use, and population status are required information to determine potential impacts.

Sec 2.2 2006 Study Reaches: The document states that in 2006 there will be 16, 100m long representative study reaches surveyed. It is important to describe how the number, length, and locations of the sites were determined. These parameters should be determined based on the information needed to achieve the purpose of the assessment. If these sites are meant to represent other reaches of stream, their representation should be described and there should be sufficient number of sampling sites to sufficiently capture variation observed in resources of the larger stream reach. A quantitative and statistically rigorous approach should be taken.

Sec 2.2 Study Timing and Summary of Activities: Specific survey activities should address specific data needs of the assessment. The proposed surveys are to determine the productive capacity of stream habitats through temporal and spatial comparisons of habitat capability and utilization. Knowledge of fish species and their life histories, including seasonal use of habitats, is required to do this (see above comment under Sec 1.0). This survey methodology will not provide these data.

The winter season is not included in the 2006 sampling period. We believe this will limit the ability of sampling to address habitat capability, utilization and productivity of the area. The availability of suitable winter habitat may be a limiting factor for the fish populations. These habitats need to be identified and assessed.

The modeling methodologies chosen to estimate habitat capability and productive capacity of stream reaches and the assignment of capability ratings for species and life history stages need to be fully described and supported by referenced literature. How this approach will determine the parameters needed to assess the potentially impacts of the project to fisheries resources should be described.

Table 1. The timing of the proposed cutthroat trout spawning survey in April to early-May is likely too early. Cutthroat trout spawn on the descending stream hydrograph and peak flows will usually occur after this timeframe. Cutthroat trout will likely start spawning after the proposed survey dates and into June. The proposed survey will likely miss characterize habitat suitability and utilization by cutthroat trout. In addition, the availability of spawning habitat throughout the study area should be determined and the reach lengths for spawning surveys should be described.

Sec 2.2.1: The description of cutthroat trout life history provided in this section should be referenced with appropriate reports and survey data. The timing for spawning, limit on size of streams used for spawning, and emergence dates do not appear typical for cutthroat trout in Flathead River tributaries. The proposed survey dates should be modified if the intent is to assess these or related characteristics of the cutthroat trout population.

Sec 2.2.3: Groundwater availability is an important characteristic of spawning and over wintering habitats. The availability and quantity of upwelling groundwater should be assessed to determine availability and quality of spawning and over wintering habitats.

Sec 3.1: MFWP has collected over 25 years of data and written over 30 publications assessing fisheries resources in the North Fork of the Flathead Drainage. Some of these data are from the Flathead River and tributaries in British Columbia. All of these data should be considered in the ongoing review of fisheries and aquatic resource information.

Sec 3.2.1: The biological and physical characteristics being surveyed should be done quantitatively. Percent composition of the streambed should be done using coring techniques and not by an ocular means, if quality of spawning habitat is being assessed. Groundwater quantity and distribution should be determined. All stream characteristics that will potentially be affected by the mine project should be measured.

Sec 3.2.4: The number of samples needed should be determined by the observed variance in initial sampling. Sampling will be needed more frequently, such as over monthly intervals, to capture seasonal changes in the benthic community.

Sec 3.2.5: This section describes a wider timeframe to assess cutthroat trout spawning than did earlier sections of this document. The later dates mentioned here are more suitable; however, spawning may continue past late June.

The electrofishing methodology provided will at best provide qualitative information and will likely be incomplete. In these relatively short and unconfined stream reaches, fish may avoid the sampling gear, especially larger fish, which will provide misleading information when assessing presence of fish species and life histories. This may also be true for detection of juvenile tailed frogs.

The methodology described will not provide reliable and statistically robust estimates of catch-per-unit-effort. If estimating CPUE and sampling variance is a goal of this survey, a much different methodology would be required as would repeat sampling over multiple years.

Sec 4.0: The sampling design described in this document will not produce a report that will "...describe and quantify existing fisheries and aquatic resources". Nor will it provide an understanding of fish species life histories needed to discuss all potential impacts of the mining proposal. The inability to assess all potential impacts will not allow for necessary mitigation plans required to minimize impacts to fisheries and other aquatic resources. The proposed scope of work will not provide the information needed to produce the quality of data and report that is described in this section.

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**July 6, 2006 United States Department of the Interior, Fish and Wildlife Service, RE: *Lodgepole Project Working Group for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act, Wildlife Technical Subcommittee***

**Re: Lodgepole Coal Mine Proposal Impacts**

**Comments provided during and subsequent to the July 6, 2006 Wildlife Working Group meeting by Chris Servheen on behalf of the US Fish and Wildlife Service.**

From the US perspective, this project is viewed as a landscape-level project; the health of the Flathead Basin ecosystem on the US side is due to efforts to minimize detrimental impacts on public lands.

Chris is unclear if the end goal of this wildlife impact assessment is management to minimize impacts during operation, or to remediate/reclaim when the mine closes.

EAO indicated that both operational minimization of impacts and mine remediation are management goals to be addressed during the wildlife impact assessment.

Four grizzly populations cross the international border area in the Flathead region, and this project has the potential to fracture grizzly populations in the US. Twenty years of mining would be equivalent to two generations of grizzlies, and it is difficult to remedy a significant interruption to these populations. Logging has been ongoing, but does not happen in the winter.

Ongoing improvement to Highway 3 near Fernie and Crows Nest Pass and ongoing development of the Fernie area may have significant impacts to grizzly bears. The Lodgepole mine and its haul road have to be put into the context of all of these developments; impacts of this mine will cumulatively interact with the other developments, and therefore, need to be included as part of the impact assessment.

There are also other proposed mines and extensive coal reserves in the Flathead as well and coal bed methane development interest; therefore any consideration of the impacts of the Lodgepole mine and its haul road need to be evaluated in this context. This project has the potential to facilitate and accelerate the development of other coal mines and coal bed methane drilling and extraction, which would cause a significant impact to this ecosystem. Once the Lodgepole haul road exists and electric lines are built into the Flathead, further energy development will require only extensions of the road and the electric system. Any evaluation of the development of the Lodgepole mine must evaluate the probability and impacts of the development of other energy projects in the Flathead basin. The development of the Lodgepole mine will result in multiple impacts beyond the mine site and haul road location including: a higher speed and heavy capacity haul road into an area that currently has only low-standard timber roads; the creation of electric power facilities deep into this drainage that currently has no electric service; and continuous winter human presence, road plowing, and industrial operations in an area that is currently not open to anything but snowmachine winter travel. It is not credible or logical to evaluate the Lodgepole mine solely in the context of its immediate, direct impacts. A thorough and credible assessment would evaluate the ancillary impacts such as facilitating the development of other energy extraction actions in the Flathead and increasing the human impacts of presence, recreation, and development throughout the Flathead drainage.

*Comments on Workplan:*

*Self-correcting capacity of the ecosystem...* Servheen has an issue with this, because the other developments reduce the ability of the environment to correct itself when Lodgepole Project impacts are included. Restored ecosystems are inferior to intact, relatively undisturbed ecosystems. The existing, complex processes and ecological interactions between organisms, hydrologic regimes, and plant and animal communities can never be recreated or replicated once they are disturbed and destroyed by major human developments.

Need to consider all land developments and their impacts on key species. For example, as traffic volume increases along Hwy 3, female bears may stop crossing the highway, so it will be impossible for the ecosystem to self-correct.

*Extrapolation of population density:* need to think about individual behaviour among the bears. Avoidance of this area is expected should the mine go ahead. Over two generations of bears may avoid this area and this will be a significant population-level impact. The population-level impacts of concern could happen due to probable changes

in survival, habitat use, dispersal, feeding, and seasonal movement patterns. These impacts will likely occur to at least 2 generations of grizzly bears, and multiple generations of other species including lynx, wolverine, wolves, fisher, mountain lions, and black bears. The single largest impacts on wildlife, however, will be increased mortality and displacement due to the increased human use of the area resulting from road improvements, year-around access, and increased human activity.

From the U.S. Fish and Wildlife Service point of view, in order to judge the impacts of this activity, you need baseline data for the entire area including the access route; 3-5 years of data are needed to capture the baseline data with which to judge impacts; and will need to consider other land developments as part of the assessment. There are numerous other sensitive carnivore species in addition to grizzly bears that will also be impacted by this mine including lynx, wolverine, fisher, wolves. Baseline data must be developed for these species as the proposed project will impact them. The degree of impact and the cumulative effects of multiple species impacts are necessary for a credible biological evaluation.

Regional study area based on movement of species, as Garth suggested, would give very large areas, more than the 8 sq km.

Access and traffic is a problem for bear and moose and other sensitive species and will create a potential fracture zone between the proposed mine and the railhead. Traffic volume will be approximately one truck every 5-10 minutes 24 hours a day (2 million tons coal/year =  $2\text{ million} \div 365 = 5479\text{ tons/day} \div 50\text{ tons/truck} = 109\text{ trucks/day} \div 24\text{ hours} = 4.56\text{ trucks/hour out} + 4.56\text{ trucks/hour in} = 9\text{ trucks/hour}$  or  $60\text{ minutes} \div 9 = \text{one truck every } 6.66\text{ minutes}$  24 hours/day, 365 days/year plus the workers travel, supplies, fuel, and maintenance vehicles). All this traffic has the high potential to alienate and fracture, and displace wildlife populations in riparian areas along the haul road and increase wildlife mortality through collisions with vehicles.

Climate change impacts should also be considered due to the trend in northward and altitudinal shifts in species range (6.1 km/decade northward or 6 meters/decade higher in elevation) (C. Parmesan and G. Yoder. 2003. A globally coherent fingerprint of climate change impacts across natural systems. *Nature* 421:37-42.). This change will have significant impacts on plant species and animal species. Ironically, such climate change results from increases in release of carbon such as CO<sub>2</sub> from the burning of fossil fuels, primarily coal (each ton of coal produces approximately 2.5 tons of CO<sub>2</sub> when burned; thus, at a production of 2 million tons/year over 20 years, the coal from the Lodgepole mine will produce 100 million tons of CO<sub>2</sub>). Given that this is a new coal mine that, if approved, will result in a net increase in CO<sub>2</sub> production that will directly contribute to additional global warming, it seems especially relevant to consider the impacts of global warming on wildlife species and their key food species in the mine influence area.

Another issue in the consideration of this mine is the external costs associated with this much carbon production. External costs are those resulting from the activity (in this case increased carbon production from coal burning contributing to continued global warming), which are rarely directly paid for by those accruing benefits from the action (in this case mining and selling the coal). Four external costs of increasing carbon in the atmosphere are of direct interest to the people and economy of British Columbia: 1) rising sea levels and the resulting impacts on coastal communities and infrastructure; 2) impacts to coastal fisheries by invading alien fish species and changes to currents and

water temperatures; 3) conversion of forest cover in significant areas of Canada and the rest of the planet to grassland biomes (see Scholze, M, W. Knorr, N. W. Arnell and I. C. Prentice. 2006. A climate-change risk analysis for world ecosystems. Proc. Nat. Acad. Sci. 103:13116-13120); and 4) impacts on forest industries due to increases in fire regimes as changes in average rainfall and temperature continue. Externalizing these costs to others allows the production of this coal and the economic consideration of this mine by the proponents. If the proportional economic costs of the resulting impacts of this carbon production from the Lodgepole mine were to be paid by the proponents of the mine rather than externalized to others, it is unlikely that they would be interested in the development of this mine. The significant ecological impacts are also a biological and ecosystem cost as well as an economic cost. These ecological costs should also be added to the cost of the coal when considering the true cost of the mine rather than externalizing these costs to taxpayers and other affected publics.

When one considers species and their status, resource management agencies often use terms like species at risk or threatened or endangered species. Fundamental to the status of these species is the amount and availability of habitat to meet their needs, and the level and type of human activity within the areas they need to survive. Land ownership patterns and levels of human development in the interior Rocky Mountains have resulted in development in almost all mountain valleys with paved, high-speed highways and railroads, contiguous human site developments including homes, agriculture and industry; and rural electrification that accelerates human development.

The fact is that few large mountain valleys in the interior Rockies outside of formally designated national parks remain undeveloped. The Flathead is one of these few large mountain valleys and one of the few watersheds crossing the international border not developed in this way. Along the US-Canada border there are few places with a full compliment of native species due to the level of human development. There are even fewer transboundary places with a full compliment of large carnivores. Thus, the Flathead is a rare area in that it is: 1) a transboundary large watershed with no paved highways, contiguous human site development, or electricity; 2) it has the full compliment of native wildlife species still present; and 3) it has all the large native carnivore species still present. If we return to terms like species at risk or threatened or endangered species, it is clear that the Flathead watershed itself is a watershed at risk and it is threatened or endangered by development. The current status of the Flathead makes it one of the rarest transboundary landscapes in North America. Industrial development on the scale of coal mining and other energy production will be an irretrievable commitment, and the unique and rare status of the Flathead will be gone forever if coal mining and energy production is allowed in this watershed. We cannot create or re-create such places. We can only make decisions to preserve them or to eliminate them. That decision to preserve this rare place or to eliminate it forever will be made with the decision on the Lodgepole mine.

The Flathead basin area has the highest level of US protection and is the healthiest drainage that crosses the Canadian-US border; it should be treated accordingly.

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**September 5, 2006 Office of the Governor, State of Montana, *Lodgepole Project Revised Draft Terms of Reference for Cline Mining Corporation's***

***Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act***

September 5, 2006

Garry Alexander  
Director, Strategic Policy and Planning  
Environmental Assessment Office  
2<sup>nd</sup> Floor, 836 Yates Street  
PO Box 9426 Stn Prov Govt  
Victoria, B.C. V8W OV1  
CANADA

*Re: Lodgepole Project Working Group for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act*

Dear Mr. Alexander:

Thank you for facilitating the continued participation of Montana in the Environmental Assessment process for the Cline Mining Corporation's Lodgepole Project.

In order to ensure that a comprehensive assessment and technical evaluation is completed for the proposed mine, it is important to have sufficient information of detailed quality. In preparation for the second meeting of the full Working Group, I have the following requests on behalf of the technical reviewing committee for the State of Montana:

1. As stated in our comments submitted April 2006, the State of Montana is not able to adequately evaluate the impacts of the proposed open-pit coal mine because the draft Terms of Reference does not include a detailed mine design plan. The proponent has not specified the location and design of waste dumps, settling ponds, the degree of up-grading to roads and the geotechnical data justifying the location of such infrastructure. The review committee requests a visual layout of the mine design, identifying the tributaries of the Flathead River and Elk River where the waste dumps, settling ponds and road crossings are located. An environmental assessment of the potential impacts to water quality, native fish populations and wildlife cannot be completed without such detailed information.
2. In addition to the Issues Tracking Table prepared by Cline Mining Corporation, could you please make available all the comments on the draft Terms of Reference submitted to the Environmental Assessment Office by the participants of the Lodgepole Working Group.
3. Could you please clarify the timeline and process for determination of the Federal triggers for application of the Canadian Environmental Assessment Act (CEAA), and an explanation of the mechanism for Cumulative Effects Analysis as related to this act and the BC Environmental Assessment Act.

Thank you again for affording the State of Montana the opportunity to comment on the proposed mine development in the Canadian portion of the Flathead River. It is our primary concern to protect the natural resource values of the Flathead River that are shared collectively by both the state and the province.

Sincerely,

Hal Harper  
Chief Policy Advisor  
Office of the Governor

Cc

Rich Moy, Chair, Flathead Basin Commission

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**September 19, 2006 State of Montana, Department of Fish, Wildlife and Parks RE: *Lodgepole Project Revised Draft Terms of Reference for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act***

**Comments on the Revised Draft Terms of Reference (August, 2006):**

Mark Deleray, Montana Fish Wildlife and Parks 9/18/2006

The following comments regard inadequate treatment of concerns previously provided to Cline Mining Corporation in April, 2006 for consideration in revising the Terms of Reference (ToR). I will reiterate these here since they are still relevant and affect the fisheries resources of Montana.

**4.5.4 Baseline Conditions, Fisheries:**

- The project study area is too limited. For Application to assess impacts to migratory westslope cutthroat trout and bull trout, which use the entire Flathead River and Elk River/Lake Koocanusa drainages, the project study site must be expanded to include all receiving waters in these drainages, such as the Wigwam River downstream of Lodgepole Creek and all along the haul route. Baseline fisheries data from the entire Flathead and Elk Drainages are needed to assess the significance of potential impacts near the project to the wider distributions of these species and the associated downstream fisheries. Migratory westslope cutthroat trout and bull trout are resources shared by British Columbia and Montana. Impacts to spawning and rearing habitat at or near the proposed project will affect the status of these fisheries in Montana, including Flathead Lake and Lake Koocanusa. The Assessment must consider impacts at this scale. The Draft ToR does not provide for this.



- The proposed baseline fisheries program will identify fish presence, fish habitat, water quality, and seasonal flow effects but it is inadequate. It does not, but must, provide the means for a quantitative assessment of westslope cutthroat trout and bull trout population demographics including juvenile and adult densities, life history strategies, and use of spawning and rearing habitats. These data are required to allow the Application to assess potential effects of the project. In addition, data across the extended drainages (Flathead River and Lake and Elk River and Lake Kootenai) are needed to assess the impacts of the project and fisheries losses at the immediate site to the wider distribution and status of these migratory species. Three to ten years of quantitative survey data would be required to establish baseline information to assess impacts of the proposed project on the larger populations.
- In the Lodgepole-ToR Issues Tracking 26Aug2006 document, the project Proponent states in ID #s 138 and 155 that there is an agreement between the Proponent and the BC regulatory authorities and BC Ministry of Environment that only one year of baseline data collection would be required. If so, is this agreement available for review?

#### 6.9 Aquatic and Fisheries Resources:

- Prediction of potential impacts includes assessment of potential for affecting fish habitat in Foisey and Lodgepole Creeks and the Elk and Flathead Rivers. There should also be predictions for all receiving waters including the Wigwam River, Lake Kootenai and Flathead Lake. Also, the Assessment should include predictions of impacts not only to habitat but predictions of impacts to specific characteristics of the migratory fish populations, including abundance and distribution near the site and in terms of impacts to these species across the drainages.
- Specific mitigation and management measures for aquatic and fisheries resources should include all six measures included under 6.13 Wildlife on pages 24 and 25.

#### 7.0 Cumulative Effects Assessment:

- The cumulative effects assessment will consider effects within the “specified cumulative effects study area boundary and specified timeframe”. In order to assess these effects and those of other projects on migratory westslope cutthroat trout and bull trout populations, the study area boundaries need to be expanded to include the entire drainages used by these fish species. These fish species rely on habitat in the entire Flathead River/Lake and Elk River/Lake Kootenai drainages. For example, an assessment of cumulative effects to spawning habitat for bull trout must incorporate all spawning habitat in the drainage to determine the significance of impacts to the larger populations.

#### 8.12 Fisheries Protection Plan:

- The Fisheries Protection Plan must also describe proposed mitigation measures for the Flathead and Wigwam Rivers and Flathead Lake and Lake Kootenai. Any habitat loss to migratory westslope cutthroat trout or bull trout, not only in Foisey, Lodgepole and Crabb Creeks, but also in the Flathead and Wigwam

Rivers represents losses to Montana fisheries. Where fish habitat cannot be maintained, the justification for the habitat loss and compensation programs must include all impacted waters and losses to Montana.

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**October 18, 2006 State of Montana Department of Natural Resources and Conservation RE: *Lodgepole Project Revised Draft Terms of Reference for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act***

October 18, 2006

Garry Alexander  
Director, Strategic Policy and Planning  
Environmental Assessment Office  
2<sup>nd</sup> Floor, 836 Yates Street  
PO Box 9426 Stn Prov Govt  
Victoria, B.C. V8W 0V1  
CANADA

*Re: Lodgepole Project Revised Draft Terms of Reference for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act*

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Dear Garry Alexander,

I would again like to thank you and Premier Campbell for allowing Montana to participate in the British Columbia's environmental assessment process on Cline Mining Corporation's proposed Lodgepole/Foisey mine. The following reflects the comments of the Montana Department of Environmental Quality, Department of Natural Resources and Conservation, Department of Fish Wildlife and Parks, the Flathead Basin Commission and Glacier National Park.

After extensive review of the Revised Draft Terms of Reference, the above listed State and Federal agencies and the Office of the Governor are concerned that the entirety of our comments submitted on the original Draft Terms of Reference were not addressed in the Revised Draft TOR. The State of Montana submitted 129 comments in total that resulted in no change to the Revised Draft.

In the February 2006 letter of invitation to Montana regarding participation in the Cline Environmental Assessment Working Group, the Environmental Assessment Office stated that the purpose of the Working Group is to review the adequacy of the baseline work carried out by Cline Mining Corporation. As stated in our April 2006 comments, we were concerned by the lack of detail, specificity and overall lack of information presented in

the original draft Terms of Reference regarding baseline and impact assessment data needs. The State of Montana submitted over sixteen pages of comments detailing known data gaps and the scope and scale of research necessary to accurately assess the impacts of the proposed Lodgepole/Foisey mine. The National Park Service submitted an additional seven pages of comments regarding the inadequacy of information. However, despite the stated purpose of the Working Group, none of these comments were responded to or reflected in the Revised Draft.

Given that the comments of the State of Montana and the National Park Service have not been addressed, we again refer you to the entirety of the original comments submitted, which are contained in the documents referenced at the end of this letter. In addition to these comments, we would like to emphasize the following:

### **The Need for a Transboundary Basin-Scale Baseline and Environmental Assessment**

At the September 2006 meeting of the Working Group, the Proponent stated that the transboundary, downriver impacts of the proposed mine are outside the scope of Cline's Environmental Assessment. Specifically, the Proponent has limited the scope of their EA to the mine site, haul road and loadout facility. The Proponent stated that they would not study the entire ecosystem and watershed of the Flathead River Basin, including water quality, transboundary bull trout and westslope cutthroat and mid and large carnivore populations.

As you well know, the proposed Lodgepole/Foisey mine lies within a region of international ecological significance. The State of Montana and Glacier National Park are downstream and downriver of the proposed Lodgepole/Foisey Project at the headwaters of the Flathead River. The proposed mine poses serious threat to the natural resource values of the Flathead National Wild and Scenic River, Glacier National Park, the world's first International Peace Park at Waterton-Glacier, a World Biosphere Reserve, World Heritage Site and the Crown of the Continent.

The Proponent has agreed to undertake an air quality analysis that includes potential impacts to Montana, Alberta and Waterton-Glacier International Peace Park. It logically follows that the assessment of wildlife, fisheries, water quality, noise and ecological impacts should also extend beyond the international border to encompass the entire Flathead Basin. Given the international significance of this landscape and the legacy of protection and preservation for this landscape, including transboundary populations of species listed under the United States Endangered Species Act (ESA), a responsible and accurate review of this mine must include the potential impacts at the basin-scale.

### **Lack of Detailed Mine Design Plan and Insufficient Comparison to Existing Open-Pit Coal Mines in the Elk River Valley**

In the first meeting of the Cline Mine Lodgepole/Foisey Working Group in March 2006, the Proponent stated that they could not guarantee that the external waste dumps and

settling ponds will not fail. At the second meeting of the Cline Mine Lodgepole/Foisey Working Group in September 2006, it was stated that all of the waste dumps in the Elk Valley have failed at least once. At present the Proponent has failed to submit a finalized mine design plan that addresses the steep topography and complex geology of the mountainous terrain in which the mine is proposed. Specifically, the Proponent cited the following uncertainties:

- Stability of the waste pit walls
- Unknown groundwater regime and hydrogeology of the waste pit walls
- Stability of the footwalls
- Stability of the pit waste rock dumps
- Stability of the plant site
- Stability of waste retention ponds
- Stability of the loadout facility and associated infrastructure

The Flathead River supports rich periphyton, macroinvertebrate, bull trout and westslope cutthroat trout populations. These populations represent a level of diversity and abundance unique to cold, clear clean mountain watersheds and are particularly vulnerable to the type of disturbance posed by the proposed Lodgepole/Foisey open-pit coal mine. The above-listed mine plan and waste dump uncertainties, as specified by the Proponent, pose an unacceptable risk to the integrity of the Flathead River and the fisheries populations it supports downstream of the proposed open-pit coal mine.

Based on these uncertainties, the Lodgepole/Foisey Project Environmental Assessment needs to include the following:

- Documentation of Elk Valley mine failures and the associated impacts
- Documentation of the fish populations upstream and downstream of the Elk Valley mines
- Documentation of the macroinvertebrate and periphyton species abundance and diversity upstream and downstream of the Elk Valley mines
- Documentation of loading of heavy metals in fish tissues, particularly selenium, upstream and downstream of the Elk Valley mines
- Documentation of water quality upstream and downstream of the Elk Valley mines
- Documentation of sedimentation and heavy metals loading upstream and downstream of the Elk Valley mines
- Documentation of nutrient loading upstream and downstream of the Elk Valley mines

### **Insufficient Response to Data Recommendations of the Technical Subcommittees**

We are concerned that the extensive analysis of baseline and impact assessment data needs provided by Working Group Technical Subcommittees has not been incorporated into the Revised Draft TOR, and is therefore, not included in the Environmental Assessment. As documented at the March 2006 meeting of the Working Group, “the

purpose of the subcommittees is to provide a forum for discussion, analysis and resolution of key technical issues associated with the proposed Lodgepole Project, and to provide advice to the EAO, the Working Group and Proponent on technical issues.”

As documented in our letter dated September 19, 2006 the state and federal agencies participating in the review are concerned that the expertise invested in the Wildlife, Water Quality and Fisheries subcommittees have not been incorporated into the Revised Draft TOR. For example, at the July 2006 Wildlife Subcommittee meeting, it was confirmed that no baseline data for grizzly bears exists at the proposed mine site. Given this, extensive recommendations were made regarding the scope and scale of baseline data necessary to accurately assess the impacts of the proposed mine on the grizzly bear population of inter-provincial and international significance. Despite this, at present, the Proponent has determined they will not conduct any baseline data collection for grizzly bears.

### **Insufficient Detail Regarding Cumulative Effects Analysis**

Montana has submitted multiple requests for more detailed information regarding Cumulative Effects Analysis (CEA), including a request for a CEA Subcommittee, which has not been established. According to the comments of the United States Fish and Wildlife Service,

“Any evaluation of the development of the Lodgepole mine must evaluate the probability and impacts of the development of other energy projects in the Flathead basin. The development of the Lodgepole mine will result in multiple impacts beyond the mine site and haul road location including: a higher speed and heavy capacity haul road into an area that currently has only low-standard timber roads; the creation of electric power facilities deep into this drainage that currently has no electric service; and continuous winter human presence, road plowing, and industrial operations in an area that is currently not open to anything but snowmachine winter travel. It is not credible or logical to evaluate the Lodgepole mine solely in the context of its immediate, direct impacts. A thorough and credible assessment would evaluate the ancillary impacts such as facilitating the development of other energy extraction actions in the Flathead and increasing the human impacts of presence, recreation, and development throughout the Flathead drainage.”

Finally, as stated previously, the proposed Cline Mine Lodgepole/Foisey Project lies at the headwaters of the Flathead Basin, which is a transboundary ecosystem of global significance. Given the ecological value of this region, we are gravely concerned at the lack of information provided thus far, and the lack of commitment on the part of the Proponent to carrying out the necessary scientific and technical research to conduct an accurate and responsible assessment of the proposed open-pit coal mine. Please refer to the referenced documentation below for a detailed description of the extent of our recommendations on the draft Terms of Reference. Based on the commitment of the Premier, we trust that you will continue to ensure the highest level of integrity for the Cline Mining Corporation Environmental Assessment, given the location of the mine within the transboundary Flathead Basin.

We look forward to our continued participation in British Columbia's environmental assessment process.

Sincerely,

Rich Moy,  
Montana Department of Natural Resources and Conservation

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**October 19, 2006 United States Department of the Interior, Fish and Wildlife Service RE: *Lodgepole Project Revised Draft Terms of Reference for Cline Mining Corporation's Application for an Environmental Assessment Certificate Pursuant to the Environmental Assessment Act***



United States Department of the Interior  
FISH AND WILDLIFE SERVICE



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October 19, 2006

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CANADA

Dear Garry,

Thank you, Garry, and thanks to Premier Campbell for allowing the U.S. Fish and Wildlife Service and the state of Montana and other US Federal agencies the opportunity to comment on and to participate in the British Columbia's environmental assessment process on Cline Mining Corporation's proposed Lodgepole/Foisy coal mine.

The approval of this mine will be an irretrievable commitment of resources in one of the most unique and ecologically important transboundary watersheds along the entire US-Canada border. Logical consideration of the approval or disapproval of this mine requires a credible process. It seems that the most defensible process would involve a stepwise approach that would lead to a logical and fact-based decision. Here is a possible outline of such a stepwise approach:

- 1) Baseline data collection on the existing natural resources in an area appropriate to the influence of the mine and haul road.
- 2) Specific to grizzly bears and key species like wolverines and lynx, determination of the mortality and displacement impacts expected and the number of adult females that would be impacted by the mine and the haul road.
- 3) Determination of the regional population impacts based on an ecosystem population assessment (i.e. a DNA grid survey).
- 4) Determination of the acceptability and sustainability of these impacts at the local and regional population levels.
- 5) Explicit consideration of the domino effect of project approval on accelerating and facilitating further energy development in the area and the expected impacts of these facilitated developments. This could only be avoided by documentation that further energy development in the Flathead will not be permitted should this project be approved.
- 6) Assessment of the cost/benefit ratios of the project benefits with the impacts on all species (with our interests being related to carnivores like grizzly bears, lynx, wolverine, etc; but realizing that there are multiple impacts on aquatic species, water quality, and non-carnivores that also need to be assessed).
- 7) Review of possible mitigation to reduce these impacts and the ability of mitigation to in fact reduce these impacts.
- 8) Assessment of the economic and environmental capability of the project to go forward with these mitigation factors fully funded and in place.
- 9) Project approval/disapproval based on this foundation of information and the results of these assessments.

In my view, project approval requires this stepwise approach with the foundation being adequate baseline information on which to build defensible decisions.

If the current baseline biological data on carnivore species is deemed sufficient, then all determinations on the impact of this mine will be based on

extrapolations. Given the irretrievable resource impacts upon approval of this mine project, it is illogical and indefensible to make this decision on extrapolations of data rather than on a foundation of actual biological information collected prior to mine development. I believe that the baseline data on carnivores in the mine area and in the area of the haul road are not sufficient to make a defensible decision using a stepwise approach outlined above. This mine, if approved, will impact grizzly bear recovery in adjacent areas of the US and will impact other sensitive species that we share along the US-Canada border.

We urge you to reconsider a decision on this mine until adequate baseline data are available to make an informed decision on this project.

Thank you again for the opportunity to comment and to participate in this process. We are committed to work cooperatively with you in the Flathead to secure the long-term health of our unique, shared ecosystem in this watershed.

Sincerely,

Christopher Servheen, Ph.D.  
Grizzly Bear Recovery Coordinator