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Memorandum

To: Cam Toohey, Special Assistant to the Secretary for Alaska

From: Vijai N. Rai, Senior Environmental Review Officer, Office Of Environme Policy and Compliance

Subject: Proposed Tulsequah Chief Mine (TCM) Project in British Columbia, Canada

Attached for your concurrence is an Issue Paper with respect to the subject mining project in British Columbia. After careful review and evaluation of all the information and documents available to date related to this project, I have concluded that the Department' continued opposition to the issuance of a mine certificate and a request for referral of the project to the Intentional Joint Commission is neither justified nor appropriate.

During the upcoming TCM Project Committee meetings, British Columbia will provide additional information and updates on the project. Unless the information and data provided during these meetings are contrary to the information that is the basis of my conclusion, I recommend that the Department no longer oppose the issuance of a mine certificate for the TCM. British Columbia and Canada have offered to include the United States and Alaska in the permit review process for the proposed mine. We should continue to work with these governments to ensure that the downstream United States resources are not adversely impacted.

Should you have any question or wish to discuss this issue further, please do not hesitate to give me a call at (202) 208-6661.

Artachment

cc: Drue Pearce
Senior Advisor to Secretary for Alaska
J:\pep\resmgt\minerals.2:V. Rai:glw: 9/28/01

Attachment

Issue Paper
Tulsequah Chief Mining Project
British Columbia, Canada

Issue:

Whether Continued Opposition to the Issuance of a Mine Certificate and a Request for Referral of the Proposed Tulsequah Chief Mine to the International Joint Commission (IJC) by the United States Federal Agencies is Justified Based on Information Provided To Date.

Background Information:

In 1993, Redfern Resources Ltd., now called Redcorp, proposed to reopen and develop the Tulsequah Chief Mine (TCM) along the east bank of Tulsequah River, a major tributary to the Taku River which flows west through the State of Alaska to the Pacific Ocean. TCM and its related infrastructure would be located entirely in British Columbia approximately 20 miles east of Juneau, Alaska. TCM is a volcanogenic sulphide deposit containing a total mineable reserve of approximately 8 million tonnes grading 1.27% copper, 1.18% lead, 6.35% zinc, 2.42g/t gold and 100.9 g/t silver. The mining is expected to occur over ten years at an annual rate of 900,000 tonnes (2,500 tpd). The deposit was previously mined from 1951-1957. Metal contaminated mine water from mine portals and associated surface dumps currently discharges into the Tulsequah River.

TCM project review process has been ongoing for the past seven (7) years and Redcorp has expended more than 10 million Canadian dollars during this process. The TCM Project Committee (PC) was established by British Columbia in 1994 and included representatives of the U.S. Department of the Interior (DOI), U.S. Environmental Protection Agency (EPA) as well as a number of State of Alaska agencies. U.S. Army Corps of Engineers was part of the review process initially but opted out after Redcorp eliminated the barge transportation alternative (primarily through Alaskan and U.S. waters) to transport ore concentrates from the mine to Skagway, Alaska. To transport the concentrate, Redcorp subsequently proposed to build a nearly
100 miles long access road through an area in northwestern British Columbia. Prior to 1998, DOI provided detailed written comments to Environment Canada on three (3) separate occasions with respect to this project. The third comment in late 1997 was based solely on comments from the United States Fish and Wildlife Service (FWS) because no other Departmental bureau had raised any additional concerns at that time.

In March 1998 after an extensive review, TCM Project Committee (PC) recommended to the responsible ministers in the British Columbian Government that the TCM be issued a mine

certificate. United States and Alaskan representatives on the Project Committee objected to the issuance of the mine certificate at this time. British Columbia (BC) approved the mine certificate despite the objections. Since that time, United States and Alaskan representatives have requested repeatedly that the project be submitted to the International Joint Commission (IJC). They have also proposed that the governments of the United States and Canada direct the IJC to establish a watershed board for the Taku River and work together to put in place a comprehensive transboundary watershed plan before considering specific projects in the watershed. The Alaska legislature, however, passed a resolution in support of the project and urged the Governor to withdraw his request for the referral of the TCM project to the IJC. The Alaska legislature subsequently transmitted its resolution to the United States and Canadian governments.

The Taku River Tlingit First Nation (Tlingit) also participated in the review process and continued to raise concerns about the project, including impacts from the proposed access road because it would traverse a portion of the territory where their traditional land- use activities are most concentrated. The Tlingit requested a judicial review by the Supreme Court of British Columbia. The Tlingit argued, among others, that the effect of the proposed access road on sustainability of wildlife and Tlingit's domestic economy was not adequately addressed during the review process. In a decision dated June 28, 2000, the Court concurred that the statutory obligation to promote sustainability was not fully considered during the review process and vacated the BC government's approval of the mine certificate. The Court also directed BC to prepare a revised PC report, which meaningfully addresses Tlingit's concerns. In August 2000, BC reconvened the TCMPC which is currently in the process of preparing a revised PC report.

The Court's decision requires BC to address impacts of the proposed access road on the sustainability of wildlife and Tlingit's domestic economy during the reconvened review process. The focus of the review below, however, is simply to evaluate impacts to downstream resources in the United States from the proposed operation, including the access road. In other words, whether to develop any resources in this region of BC is not the subject of this review because the mining operation, including the access road, would be located solely in BC.

General Comments:

The Taku River and its salmon fisheries are of special concern to the United States and Alaska because of its extensive, productive salmon habitat and the valuable Alaska fisheries that depend on this natural production. Downstream wildlife, including migratory birds and bald eagles, are also important resources and therefore should not be adversely impacted from the proposed access road and mining operation. The issue however is not the importance of downstream resources (because they are clearly important) but whether mining operations, including the

tailings impoundment, access road and others, would be designed, constructed, and operated in a way that would mitigate and/or minimize any significant adverse impact to downstream resources.

During the last three years, United States and Alaska have raised a number of concerns, including those involving the proposed tailings impoundment and downstream water quality. They have reiterated that a number of issues that are "strategic" remain unresolved and therefore a mine certificate should not be issued at this time. As discussed below, I believe that BC and Canada have satisfactorily addressed our concerns with respect to impacts to downstream resources. Any concerns that remain or have not been fully addressed to our satisfaction are not "strategic" and could be adequately addressed during the permitting phase. Moreover, I am troubled by a number of procedural issues and barriers that the United States Federal agencies and the State of Alaska have raised during the review process to delay the project indefinitely. As an example, these agencies have attempted to impose performance standards for TCM unlike those that we require for proposed mining operations on public lands in the United States. In addition, these agencies have insisted that Redcorp and/or the BC government provide certain data and information prior to the issuance of a mine certificate when such data and information are normally collected and provided by proponents during the approval of proposed mining operations (second stage review) on public lands in the United States. The review requirements under the Canadian Assessment Act (CAA), other applicable statutes, and implementing regulations are not fundamentally different from those under the National Environment Policy Act (NEPA) and related statutes, and implementing regulations involving public lands in the United States. The BC government has harmonized the CAA and other applicable Canadian and BC statutes into its review process for mining projects in BC.

The following illustration with respect to proposed mining operations on public lands in the United States may help clarify this point. As part of the review process, U.S. Federal agencies are required to analyze environmental impacts on the human environment from proposed actions, including mining, on public lands. An environmental impact statement (EIS) may be prepared for a proposed action and is followed by a record of decision (ROD). Once a ROD has been issued, only then the proponent is required to submit detailed engineering designs, including mining plans, with respect to its operation. This is called a plan of operation (POO) which must be approved prior to mining and may require preparation of another EIS. Two stage review is cost- effective and does not result in excessive expenditures at the initial stage of the review process which are often prohibitive to companies such as Redcorp. The Council on Environmental Quality (CEQ) regulations also provide additional guidance on expenditures at this stage of the review process by not requiring Federal agencies to include information in the EIS where the overall costs of obtaining it are exorbitant or the means of obtaining it are not known.

However as part of the review related to TCM, U.S. Federal agencies have continued to insist that Redcorp provide us data and information at the initial stage (certificate stage) that we

normally require from proponents of mining projects on public lands as a part of POO (second stage review). In addition, the performance standards, that these agencies have continued to insist that Redcorp must comply with, are significantly more stringent than those that were finalized during the waning days of the Clinton Administration for hard rock mining on public lands. For example, Redcorp has proposed to construct the tailings impoundment based on a 200-year flood event, a significantly higher standard than those currently in effect for tailings impoundments on public lands in the United States even under the revised regulations.

Below is a review of specific concerns with respect to tailings impoundment, water quality and other issues that the United States Federal agencies have previously raised with BC and Canada. I have attempted to address the tailings impoundment and water quality issues in greater detail because the objections to the proposed project by Federal agencies during the last three years have been primarily based on these issues. In my view, these concerns have been adequately addressed by BC and Canada and therefore a recommendation by DOI and other Federal agencies to continue to deny a mine certificate for TCM is neither justified nor appropriate.

Tailings Impoundment:

Location of Tailings Impoundment and Possibility of Flooding: As part of the review process, seven potential tailings containment areas were initially identified and assessed. These sites were considered to be the only potential areas within 10 miles of the mine due to rugged topography and steep slopes. The proposed Shazah Creek tailings impoundment area would be located on an alluvial fan which has formed where the Shazah Creek exits a rocky gorge. The tailings impoundment would be located more than a mile away from the active flood plain of the Tulsequah River and would be about 30 to 60 feet above the elevation of that flood plain. The tailings impoundment, however, may be subject to infrequent flooding from Shazah Creek and therefore an armored berm will be incorporated into the downstream face of the tailings dike as a protection against erosion and scour from Shazah Creek. This structure would also divert any flood flows that might escape the creek channel and flow across the alluvial fan. Redcorp has proposed that the design of the impoundment and armored berm would be such that they could withstand a 200-year flood event. Tailings impoundment would include a toe drain, erosion protection and overflow spillway. To minimize seepage from the impoundment, a polyethylene liner will be placed over the embankment and the entire containment basin. Tailings supernatant will be recycled as process water or will be treated in the effluent treatment system prior to any discharge into the Tulsequah River.

Tailings Characteristics: One of the key elements of the environmental protection measures proposed by Redcorp involves the unique characteristics of the tailings that are to be placed in the impoundment. Unlike typical tailings in an impoundment which are generally highly toxic and require perpetual maintenance, Redcorp has proposed to first separate the waste rock

generated from its mining operation, including those from previous mining, into sulfide-rich tailings and low sulfide tailings. All the sulphide-rich tailings (about 50% of the total tailings)

would be backfilled into underground mine openings thereby eliminating altogether any acid mine drainage from these tailings. **DOI has earlier provided comments why all of the tailings will not be returned to the worked out mine area. To do that would be technically impossible and therefore it cannot be accomplished.**

The tailings reporting to the impoundment are expected to contain 1% sulphur by weight. In order to maintain neutral conditions, up to 6% limestone by weight of would be added to the tailings prior to pumping in the impoundment. **The basic premise, as proposed by Redcorp, with respect to tailings to be placed into the impoundment is that they are not likely to generate acid and therefore the tailings impoundment would be reclaimed to a natural state after mining ceases.**

The testing methods to determine the acid generating potential of tailings are well documented and fully recognized. In its review, EPA has previously stated that appropriate methods were used for evaluating the potential for acid generation and metal transport from existing waste rock, and from future tailings and waste rock. DOI has not questioned the testing methodology to determine the acid generating potential of these tailings yet has continued to state that the tailings impoundment would remain in perpetuity.

Contingencies: The expected seepage rate from the tailings facilities is expected to be 0.0001 m3/sec. (3153 m3 /year). Contingencies from contamination from tailings impoundment seepage include a series of monitoring wells to determine the rate/concentration of any contamination and the ability to set up a series of pumping wells to intercept any contaminant plume and divert the water to the treatment plant if necessary. Direct discharges from the tailings impoundment to the receiving environment is not proposed. In addition, the tailings impoundment will only receive mill process water and will not receive minewater.

Catastrophic Debris Flow: EPA and FWS have repeatedly raised concerns about the potential for catastrophic debris flows to cause serious damage to the impoundment structure. First, EPA suggested that the proponent undertake a Carbon-14 dating of the alluvial fan (to my knowledge it has never been done for any proposed tailings impoundment in the U.S.) to determine its age as well as initiate a number of other steps to ascertain whether the area was subjected to any catastrophic events. Based on additional discussions and meetings, U.S. federal agencies subsequently agreed that Carbon -14 dating was unnecessary and there are no fatal flaws in the site, and that details of the site (one last look at alternatives) can be worked out in the ongoing BC permits process with U.S. participation.

A Research Geologist, Dr. Lionel E. Jackson, of the Canadian Geological Survey conducted further review and analysis of four lithologic logs and the geomorphology of the Shazah Creek and reiterated that there is no evidence of glacial outburst floods in the area. He stated that the fan has experienced considerable but progressively decreasing fluvial sedimentation during the

last 150 years. Most of the morainal detritus in the Shazah Creek basin has already been eroded and either transported to the Tulsequah River or deposited in the Shazah Creek fan. Therefore, he stated that conditions which could create catastrophic outburst floods in the future simply do not exist in the area. He concluded also that further drilling and sedimentary architecture and history structures can be carried out within the permitting phase rather than at this stage of the review process. BC has repeatedly stated both during the project review and the bilateral meetings, that core drilling of the fan will be completed to determine the method of deposition prior to issuing required permits for construction of the facility. Final design criteria for the tailings facility would, if necessary, be able to account for the potential of a large depositional event. Design
and construction of the tailings facility would be in accordance with standards established by the Canadian Dam Safety Association and would address foundation seepage, stability, including earthquakes, loading, slope stability, erosion, seepage control and others.

However, U.S. Federal agencies have continued to reiterate that the siting of the tailings impoundment is a "strategic" issue and therefore further drilling, etc. should be carried out at this stage and prior to the issuance of the mine certificate.

Ground Water: Another concern raised by Federal agencies with respect to the siting of tailings impoundment involves ground water. Ground water in the area generally occurs at shallow depth. BC government reviewers have acknowledged that a prolonged precipitation or sudden snowmelt could temporarily raise the water table in the impoundment without destabilizing the impoundment or the foundation because they will be well drained. Tailings impoundments, unlike many dams, are generally not very large structures and have been successfully designed in other regions where ground water occurs at shallow depth. There is no technical reason why a tailings impoundment using Canadian Dam Safety Standards and Protocol cannot be constructed in this area also.

Based on review of all the information and data available to date, I conclude that there is no meaningful justification to continue to oppose the issuance of a mine certificate because Redcorp has not completed an additional core drilling program at this stage in the review process. Core drilling may provide additional guidance with respect to the type, size of armoring, and other modifications that may be required to protect the tailings facility. In my view, it is not a "strategic" issue. Based on this review, I believe there are no fatal flaws in the design of the impoundment and the structure can be readily modified, if necessary, based on any new information and data that may become available during the permitting phase.

Transboundary Water:

Water Quality: The water quality at the United States/Canada border in this area generally meets water quality standards during normal flows but exceeds U.S. water quality standards for certain metals during high flows. The high metal concentrations in the Taku River are thought to

be the result of natural geomorphic processes, and previous mining in the drainage basin. The discharge from the old TCM portals and waste rock currently generate acid mine drainage and contribute to the metal loading of the system. Redcorp has proposed to remove most of the sulphide-bearing materials in the waste rocks from previous mining activity and backfill mine openings with the sulphide-rich tailings. This action is likely to improve water quality in the Taku River and would likely neutralize any potential adverse impact to water quality from the proposed TCM project. Waste rocks from other previous mining in the area such as the Big Bull Mine also generate acid mine drainage which in turn contribute to the metal loading in the system. Acid mine drainage from past mining activities continue to degrade water quality not only in BC but also in the United States. These activities generally took place prior to the enactment of major environmental protection statutes and therefore were not subject to regulatory reviews that exist today.

Under current technology, acid mine drainage from past mining activities must be treated in water treatment plants in perpetuity. Redcorp's proposal to dispose sulphide-rich tailings from previous mining activities into mined out areas at Tulsequah Creek would eliminate the need to have a water treatment plant in perpetuity. Therefore, it is appears to be a more suitable method to dispose acid generating waste rock from previous mining. BC government and Environment Canada officials have indicated that they plan to address the discharge from the Big Bull Mine at the permitting stage. We should continue to work with BC and Canadian government officials during the permitting phase to address water quality concerns from previous mining activities in the region. If these concerns are not satisfactorily addressed during the permitting phase, we should explore other options through binational discussions to eliminate transboundary water quality degradation in this region. The water quality in the Taku River has been somewhat impacted (primarily during high flows) from mining activities in BC that took place in the 50s, nearly half a century earlier. This issue can be addressed through binational discussions without restricting any development activities in this region of BC (as suggested by U.S. Federal agencies) until a watershed board is established and a comprehensive transboundary watershed plan for the Taku River is prepared.

Tulsequah Chief Discharge Assessment: The quality of effluent before discharge to the receiving waters would have to meet both the Metal Liquid Effluent Regulations as well as site-specific objectives determined by BC in consultation with others, including Alaska and the United States. According to the Canadian Department of Fisheries and Oceans, this determination is not "strategic" in nature, as its implications are "how much" water quality treatment would be required, and not whether discharges would be permitted. I concur with this assessment and recommend that we work with BC and Canadian officials during the permitting phase to ensure that the proposed water quality treatment is appropriate and would not degrade transboundary waters.

BC government officials and Redcorp have been reviewing a number options to ensure that any discharge of treated water is consistent with the State of Alaska's mixing zone regulations.

Mixing zones are limited in size through discharge engineering (diffusers where practical), water conservation measures to limit discharge volumes and choosing discharge locations which maximize immediate dilution. The Tulsequah River is a very dynamic river system which consists of braided channels. In such a system, channel locations and flow rates are subject to frequent changes making calculation of effluent dilution factors extremely difficult. To ensure that discharges would be in compliance with Alaska's mixing zone regulations, the BC government is looking at innovative technologies, such as buried discharge pipes which would inject treated water into ground water regime. In ground disposal of treated water below the water table is commonly practiced by the oil and gas industry in the United States. The consultant, Komex International Ltd., in its report to the BC government, cited a number of successful examples of discharge of treated water into the ground water. The consultant concluded that the discharge philosophy is technically feasible and, as long as the treatment methods are properly designed and managed (which is not a difficult challenge) the integrity of the receiving waters can be maintained. I concur with this assessment. The detailed design can be specified in the permitting phase to ensure that the receiving waters are not degraded.

Toxicity:

FWS has previously stated that acute toxicity tests using Daphnia and trout have been conducted by the proponent **and have not shown toxicity from treated effluent.** FWS, however, recommended that in addition to the acute toxicity tests, the proponent undertake the chronic toxicity tests of the biomass to assess the toxicity potential of any tailings seepage prior to the issuance of a mine certificate. Redcorp and BC have been conducting chronic toxicity testing and have agreed to take necessary steps to protect biota based on the results of chronic toxicity testing. BC has stated that all of the toxicity testing methods used in mining regulation in BC are based on well established protocols, which are either identical to those used by EPA, or equal in terms of past methods validation studies.

BC officials have provided the State of Alaska a risk assessment proposal with respect to TCM that is similar to those for the Kennecott Greens Creek Project in Alaska which was provided to BC by Alaska officials as an example of a typical risk assessment involving a mining project in

Alaska. U. S. Federal agencies and Alaskan agencies should work cooperatively with their counterparts in BC and Canada to ensure that measures such as those in Alaska are implemented to protect downstream resources.

Access Road:

The impacts associated with the access road on sustainability of wildlife and the Tlingit domestic economy are currently being addressed by TCMPC in view of the Supreme Court's decision.

Redcorp has proposed an Access Control Plan for the road for preventing and mitigating adverse effects of access into the area. These include, among others, use of locked security gates, monitoring use of the road by others, firearm restrictions, speed restrictions and others. BC has reiterated that the design, construction, operation and de-commissioning of the access road will be tightly controlled through compliance with the Forest Practices Code and the fisheries management follow-up programs. These measures are intended to ensure that the road will not cause any significant adverse effects on fish habitat, water quality or wildlife in BC and Alaska. DOI provided comments regarding access road construction, including road crossings and sediment prevention measures to protect fish habitat. I believe that the road construction as proposed would prevent sediments from reaching fish habitat and is in accord with DOI's earlier comments involving the access road.

Impacts to wildlife from the access road are likely to be concentrated in BC. Baseline data with respect to wildlife and their sustainability are currently being analyzed by the TCMPC to address Tlingit concerns.

U.S. Federal agencies have raised concerns that the access road may not be decommissioned after completion of mining at TCM as proposed. Their concern is based on a premise that the region has other natural resources such as timber and mining claims which are likely to be developed and therefore the access road would not be de-commissioned. Based largely on these concerns, the agencies have proposed that a watershed board for the Taku River be established and a comprehensive transboundary watershed plan be put in place before considering any projects in the watershed, including TCM.

It is possible that the road may not be decommissioned in the future as intended. It is also possible that these resources may be developed in the future. However, the road is entirely located in BC and the decision whether to decommission the road or to develop these resources should be made by BC and Canada. The focus of our review should be to ensure that the access road and development activities, if any, in the future do not adversely impact downstream resources in the United States.

Wildlife:

In a letter dated February 8, 1995, DOI identified various wildlife in the United states that may be impacted by the proposed project and suggested measures to mitigate adverse impact to the wildlife.

The BC government has reiterated that wildlife impacts can be adequately addressed through the mitigation strategies proposed and through the comprehensive monitoring program as part of an adaptive management framework. The combined Grizzly Bear Monitoring Plan and Cumulative Effects Assessment of direct, indirect and cumulative effects of the mine site and the access road

on grizzly bears and their habitat have been designed by BC to study impacts over a longer time frame and larger spatial scale. The wildlife (Ungulate) Monitoring Plan is similarly designed to monitor populations of caribou, moose, mountain goat and thinhorn sheep around the mine site and access road in order to help maintain herd abundance, distribution and productivity at natural levels. TCMPC would be provided an update and review of issues involving wildlife and their sustainability at the upcoming TCMPC meeting. FWS should review the latest update to wildlife issues to ensure that transboundary wildlife resources would not be adversely impacted from the proposed activity and mitigation plans would be adequate.

Cumulative Impact:

As part of the review process, TCMPC has reviewed impacts from previous mining activities in the area as well as from the proposed TCM project. FWS, however, has expressed that impacts from future development activities in the area be also included in the cumulative impact analysis because the road is not likely to be decommissioned after the mining ceases and other mineral claims and timber are likely to be developed. For the following reasons, I disagree.

No other specific development activity in the region, other than the TCM project, is either proposed or contemplated. It is true that there are timber resources and numerous mining claims in the region, however, neither the BC nor any other entity has indicated that these resources are likely to be developed in the future. Moreover, filing of mining claims in itself does not necessarily mean that a mineral deposit is actually present. Therefore, it is highly speculative to assume that future development activities in the area are likely to occur. To require BC to include impacts from these activities in the future in the cumulative impact analysis would, in my view, be contrary to requirements under NEPA. There, only reasonably forseeable future actions are included in the cumulative impact analysis. I do not believe that any potential future development activities in this area would be viewed at this time as reasonably foreseeable future action within the meaning of that term under NEPA. Consequently, impacts from these future actions, if any, would not be included in an EIS. As an example, mining claims are located on public lands

throughout the western United States but are not included in the cumulative impact analysis because any future development of these claims is highly speculative and therefore would not be viewed as reasonably foreseeable future action. Under CAA, these future activities would be viewed as hypothetical and as such would be excluded from cumulative impact analysis. Moreover, the proposed TCM project specifically provides that the road would be decommissioned and we have no direct evidence at this time to substantiate that it would not be decommissioned.

Recommendation:

Based on the above review, I believe that the proponent (Redcorp) has taken appropriate steps to minimize and/or mitigate any significant adverse impact to our downstream resources by the

proposed TCM project. Therefore, continued opposition to the issuance of a mine certificate for the proposed project and a request to refer the project to the IJC by Federal agencies is neither justified nor appropriate.