

MEMORANDUM

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

(TFC) 25
State of Alaska

ALASKA HYDROLOGIC SURVEY - 400 Willoughby Ave.
JUNEAU AK 99801

TO: JOHN DUNKER
Natural Resource Officer

THRU: BILL LONG *BL*
Chief, Alaska Hydrologic Survey

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DATE: 1 MARCH 1993

FILE NO: RECEIVED JUN - 3 1993

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SUBJECT: AJ Hydrology
(Gold Creek)

EXECUTIVE SUMMARY

Gold Creek presently has three certified water rights for a total of 144.8 cubic feet per second (cfs), although this amount is not used all the time. AEL&P has certified water rights for 137 cfs for hydroelectric generation and the City and Borough of Juneau (CBJ) has two certified water rights totalling 7.8 cfs for municipal water supply. The CBJ has applied to DNR to increase their water rights to 18.6 cfs, and Echo Bay Exploration has applied for up to 20.6 cfs (on an annual basis) for mining related operations. The purpose of this memo is to provide hydrologic information to facilitate adjudication of these requests by the Water Management Section of the Division of Water. This adjudication will include re-examining the historic water use rates and existing rights to use water by all water rights holders and current applicants for Gold Creek water (G. Prokosch, Alaska Div. of Water, oral commun., 1993). The average annual flow in Gold Creek is approximately 116 cfs, and during winter low flows Gold Creek flow generally decreases to less than ten cfs. Currently, during low flow events, Gold Creek may not be capable of supplying sufficient quantities of water to existing users.

This report summarizes the effects of proposed diversion of water on existing water rights holders and applicants. To determine the effect of diverting water draining through the AJ mine away from Gold Creek, a study was completed by Echo Bay's consultant and the Alaska Hydrologic Survey. It was determined from both a computer model and field data collected in this study that during low flow events the CBJ well field in Last Chance Basin can be pumped at approximately the same rate that Gold Creek flows. Because of this, estimating Gold Creek flows is critical in determining impacts to the CBJ after diverting the mine drainage water.

The amount of water proposed to be diverted away from Gold Creek is significant because it may unduly effect the CBJ current and future pumping plans. At the end of mining the probability of a shortfall during any given year is estimated to increase from 30 percent to 48 percent at the present CBJ certified water right of 7.8 cfs. This estimation represents a 60 percent increase in the expected number of years that the well field would experience a shortfall under a 30-day low flow scenario.