Pebble Project

NORTHERN DYNASTY MINES INC.

ENVIRONMENTAL BASELINE STUDIES

PRELIMINARY SUMMARY
STUDIES PERFORMED BY MICHAEL MINOR & ASSOCIATES, INC.
NOISE

The objective of the noise baseline study is to characterize the type and magnitude of existing noise sources in the areas that may be affected by the operation of the Pebble Mine. The study area includes noise-sensitive areas in Newhalen, Iliamna, Pedro Bay, and Nondalton.

1. SCOPE AND METHODS

The noise study is intended to meet the requirements of the U.S. Environmental Protection Agency and U.S. Bureau of Mines guidelines for the preparation of an affected-environment noise analysis. The purpose of this phase of the analysis is to characterize the existing environment in preparation for a detailed operational noise analysis of the mine. The potentially affected environment is being characterized by a series of on-site noise measurements and on-site inspections.

For purposes of studies such as the one being conducted for the Pebble Project, “noise” is generally defined as unwanted sound. Noise is measured in terms of sound-pressure level, and is usually expressed in terms of decibels (dB). The human ear is less sensitive to higher and lower frequencies than to mid-range frequencies; therefore, sound-level meters used to measure environmental noise generally incorporate a weighing system that filters out higher and lower frequencies in a manner similar to the human ear. This system produces noise measurements that approximate the normal human perception of noise. Measurements made with this weighing system are termed "A-weighted" and are specified as "dBA" readings.

Several noise descriptors are used that take into account the variability of noise over time. The equivalent sound level (L_{eq}) is the level of a constant sound for a specified period of time that has the same sound energy as an actual fluctuating noise over the same period of time. It is an energy average sound level, and the primary noise descriptor for the noise study. Other descriptors used are the L_{min}, L_{max} and L_{10}. The L_{max} and L_{min} are the maximum and minimum sound level, in dBA, measured during the preset measurement period. The L_{10} is the sound level which is exceeded 10 percent of the time; therefore,

during a 1-hour measurement, an L_{10} of 70 dBA means the sound level equaled or exceeded 70 dBA for 6 minutes during that hour.

2. MONITORING LOCATIONS

To date, ambient noise levels were measured at 13 different locations in the study area. Descriptions of the current monitoring locations are given in Table 1. Monitoring in Nondalton will be performed in January 2007.

TABLE 1
Noise Monitoring Sites

Mon #	Description	Monitoring Type[a]
M1	North of Iliamna airport near the end of Newhalen River Rd. near the fishing camp and winter river-crossing area	Short-term
M2	North of Iliamna airport at the last occupied residential home on the Newhalen River Rd.	Short-term
M3	Iliamna airport, in front of the main terminal	Short-term
M4	Intersection of Iliamna Village Rd. and Newhalen Village Rd., by post office and medical clinic	Long-term
M5	Newhalen residential area, just off Newhalen Village Rd.	Short-term
M6	Newhalen school, in front of the school near Newhalen Village Rd.	Long-term
M7	Roadhouse Bed and Breakfast and single family residence on Iliamna Village Rd.	Long-term (winter) short-term (summer)
M8	Near Iliamna Village General Store on Iliamna Village Spur Rd., close to several residential buildings	Short-term
M9	Near the docks at Slop Bucket Rd. and Iliamna Village Spur Rd., close to float plane moorage	Short-term
M10	Pedro Bay, along the shore of the lake, next to several cabins used for fishing trips, also the location where several float planes were moored	Short-term
M11	Pedro Bay, behind the Tribal Center, up the hill parallel to the residential receiver closest to the potential haul route	Short-term
M12	Pedro Bay, on the school grounds near the main entrance—additional noise levels were taken behind the school at the power plant	Short-term
M13	Pedro Bay, southern end of E. Bay Rd. near residential areas south of the core area	Short-term

a. Short-term sites were monitored at least three times throughout the day for 30 minutes. Long-term sites were monitored continuously for at least 23 hours, except site M7, which was monitored for 16 hours that included daytime, evening, and nighttime.

Major noise sources include float planes, aircraft flyovers, helicopters, vehicle traffic—including snow machines during winter months and all-terrain vehicles (ATVs) during summer months, general construction and maintenance, residential and community activities, birds, and wind.

3. ONGOING STUDIES

One additional noise-monitoring session is tentatively planned for winter 2007 in the Nondalton and Iliamna areas. The purpose of this trip is to obtain additional noise levels during winter months and to monitor at several locations in Nondalton.