

MEMORANDUM

TO : K.A. O'CONNOR
 FROM: M.D. KIERANS
 SUBJECT: TAILINGS PILE GRADE DRAIN LEASE
 DATE: JUNE 17, 1984

1. Between June 11 and June 16 we sampled 4-3 sites on the tailings pile. The amount in lbs was 5,389 lbs or about 1.8 Cubic yards of tailings gravel. Sample sites were taken at random on the surface of the tailings pile — spaced about 100' apart.
2. The gravel itself was about 70% pebbles and cobbles and 30% sand, clay and silt. Pebbles and cobbles were moderately well washed.
3. Samples were taken from the side of a ^{"cat"} road put down along the length of the 850' tailings pile. The depth of sample is about 6"-12" below surface of the pile. These samples weighed 125.3 lbs as a mean. This mean varied about 10% per sample at the 95% level of confidence. That is, statistically, the bags varied in weight from about 137 lbs to 113 lbs.
4. Gold was found in every sample. The bottom half of the "live bottom" box was not pulsating properly. This will be repaired.
5. If one assumes that 3 specks equal one colour then the mean of colours found per sample was

was 3.26 colours. These colours were not flat but in general tended to be somewhat rounded. I suspect the flatter colors were lost in the sluicing. Flat gold particles should be recovered in a centrifugal or or other fine gold production recovery system.

6. Two tests were run on ^{sample} tailings and significant amounts of fine specks were found in the 'five-bottom' sluice box tailings.
7. The mean of 3.26 colours, according to ~~the~~ central limit theorem calculations would vary about 27% at the 95% level of confidence. The statement of precision is 3.26 ± 0.87 colours for the mean at the 95% level of confidence. In other words I conclude that the consistency of results warrants a larger sampling program, preferably by drilling, in order to establish an accurate grade and volume for the tailings pile.
9. It would be a waste of time and money to use a standard or even a pulsating riffle box in the sampling or production units. Some of the more advanced fine gold production machinery should be used. These ^{could} include, Reichert spirals, Corbus Gyro, Hy-G Concentrator, Blue Goose, Knelson Hydrostatic Concentrator and various types of horizontal centrifugal concentrators including Vardax systems.
10. No grade can be assigned at this time but with fine gold recovery systems it is possible that

the value per yard could be as high as \$^{.033} 15⁰⁰/C.Y. If production costs are 4⁰⁰/C.Y. then profit could be about 10⁰⁰/C.Y. I estimate between 200,000 and 300,000 C.Y. in the pile. Maximum profit could be 3 million dollars. It is not possible to assign a meaningful grade from a surface sample on a pile, at least, 50 feet deep. Beside it has been shown that only fine gold is in the tailings pile. We found one small, very small nugget in the sampling to date.

11. In order to sample the whole pile and provide accurate volume measurements I suggest a 6 5/8" Becker hammer drilling project.

12. This program would involve ^{100' per line (width)} 4 holes per sectional line ^{at} about 25' spacing on the lines. The sectional lines should be spaced about 150' apart. This means 5 lines of drill holes. At 8 triangles per line ^{there would be} ~~means~~ about 40 triangles for grade and volume estimates using the 'Triangle' system. Each hole will be about 50' each. This will ~~total~~ ^{total} about 1000' of drill hole. Drilling and processing costs should be about \$50⁰⁰/foot. The drilling program should cost about \$50,000. There is little doubt that a reliable average grade, ~~and~~ ^{volume} and precision statement could be arrived at after such a program. At about 25 lbs per foot ~~means~~ about 25,000 lbs of sample material will be processed, or about 10 C.Y. of ^{sample} material.

13. H y- G Concentrators of Battle Mountain, Nevada manufacture a 8" centrifugal concentrator

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13. H y- G Concentrators of Battle Mountain, Nevada manufacture a 8" centrifugal concentrator

which processes 2-4 cu yd/hr. Using this concentrator (cost \$3,750.00 U.S.) we could not only process the drill holes but for volume, and especially, grade checks could process back hoe hoes to shallow depth. This could boost our sample volume to over 100 C.Y. — or even more. But the main emphasis for accurate grade determination should be on drill hole determinations. This ^{H₁G} concentrator is mounted on wheels and includes a hopper, pumps etc. As I remember the complete wheel-mounted unit costs about \$70,000 Canadian.

14. Hy-G and the Corbus Gyro-Separator ~~manufactures~~ (manufactured by US Mining and Engineering) ~~has~~ ~~a~~ high speed ^{vertical axis} rotating riffled cylinder. Capacity is about 150 C.Y. per hour. Or about 3,000 C.Y. per 20 hr day. In two seasons the tailings pile could be mined. Capital and testing costs should be about \$300,000. The equipment could be used to process new tailings for years and years as the Dan channel is mined.

15. A next step in a preliminary sampling test could be to use the "live-bottom" slivers in a depth test. The D^B cat could put down ^{a few} 5-6' small trenches on the tailings pile and 100 lb samples should be taken from trench bottom. Depending on results some ^{preliminary} conclusions could be reached about possible depth variations in grade.

Respectfully submitted

M. D. Kiran

P.S. We tested 4 samples (about 400 lbs.) from the tail race of the sluice box area. We found no significant increase in gold recovery in our sampling. In fact the sample with the highest gold content was hundreds of feet from the sluice recovery area. The conclusion is that the tailings probably contain much more ^{gold} than the settling ponds.