

FILE

TILlicum 075

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TILlicum GOLD PROJECT

Review of

PROPOSED UNDERGROUND DEVELOPMENT

Sept. 1, 1983

Holt Engineering Ltd.

INTRODUCTION

At the request of Mr. John S. Brock, President of Esperanza Explorations Ltd., E.S. Holt of Holt Engineering Ltd. visited the Tillicum gold property on August 26 and 27. The principal purpose of the on-site examination was to review alternative underground development possibilities and select an appropriate program.

The guidance and assistance provided by Wayne Roberts during the on-site examination is gratefully acknowledged.

PROGRAM OBJECTIVES

The principal objectives of the proposed underground development program are:

1. to confirm the grade and configuration of the presently known reserves,
2. to expand geologic knowledge of the deposit as an aid in locating additional reserves,
3. to provide access for underground drill testing,
4. to provide bulk samples for metallurgical test work, and
5. to prepare for eventual extraction of the reserves.

The primary objective of the program is to provide a maximum of well documented geologic, sampling and related information for use in the pending detailed economic evaluation. Of similar importance is the need to consider the longer term use of underground workings for additional exploration and ultimately for extraction of the reserves.

The size of the program is limited primarily by the need to maintain due regard for the cost involved. The desire for

additional data and more advanced production preparation must be weighed against the inherent risk involved when investing funds at this stage of a project's development.

In order to provide the information necessary for a feasibility study, the underground development must include at least one development heading which penetrates a variety of reserve grade material. This is particularly important when dealing with erratic high-grade gold deposits. It is essential that a considerable strike length of ore be exposed, so that a detailed geologic mapping and sampling program can determine the metal content, widths and configuration of the deposit. A drift approximately 85 metres in length at 2165m elevation is proposed for this purpose. The information from the 2165m drift will be supported by data obtained from related development work depending on the program selected.

ALTERNATIVE PROGRAMS

Two Alternative programs are proposed for management's consideration as an initial development phase. They are:

- (A) A Minimum Evaluation Program
- (B) An Expanded Program which provides for production preparation.

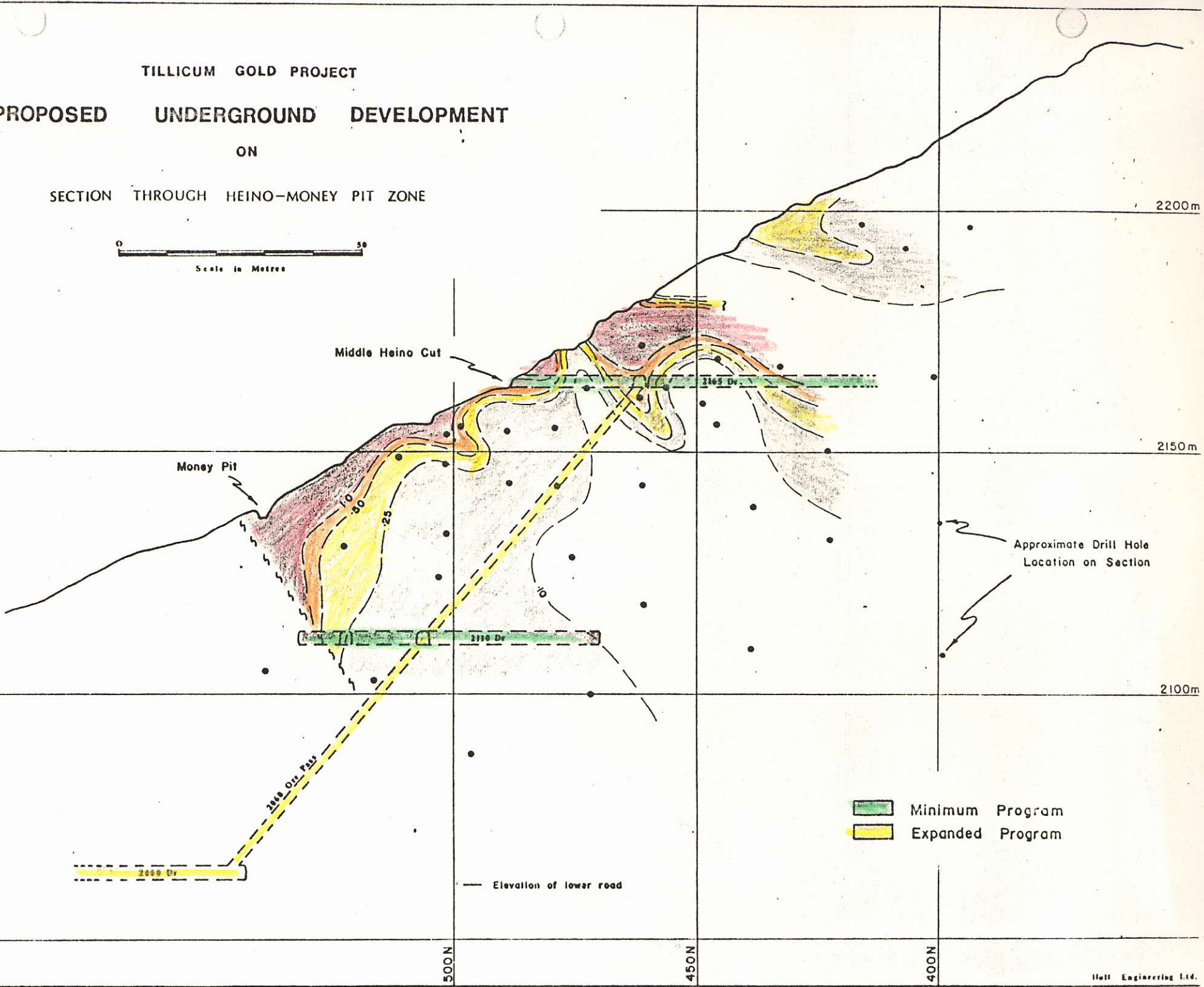
The Minimum evaluation program includes the following underground development:

- 2165 Drift approx. 85m
- 2110 Drift approx. 90m

It would provide the excavation necessary to confirm the presently known reserves and therefore would meet the project's immediate requirements. The principal drawback of the Minimum Evaluation Program is that permanent access to the ore zone will not have

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 ON

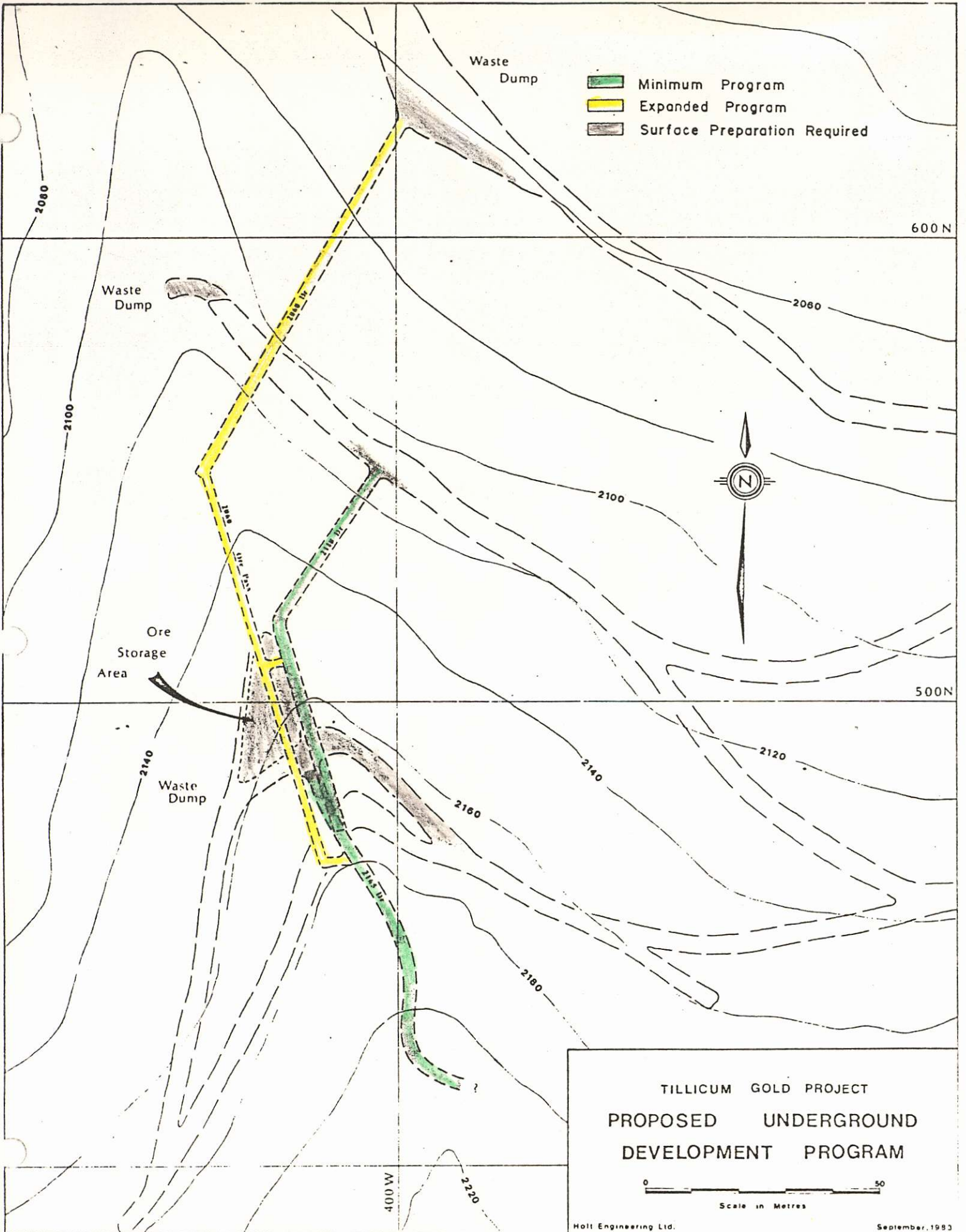
SECTION THROUGH HEINO-MONEY PIT ZONE



Minimum Program
 Expanded Program

Approximate Drill Hole
 Location on Section

Elevation of lower road



been established. The access roads and portal areas are hazardous for anything other than small 4-wheel drive vehicles.

The expanded program would include development on the 2060 m level which could be collared on the relatively flat area beside the main road. Year round access and ore haulage from the 2060 m level is a realistic possibility.

The expanded program would involve an additional 90 metres of lateral development and 130 metres of raising.

Cost comparisons for the two programs would be in the order of:

Minimum Program	\$300,000
Expanded Program	\$620,000

The upper levels work would have to be done during the summer field season, while the work originating on the 2060 m level could conceivably be done almost any time of year.

PROBLEM AREAS

The principal complicating factor is the local topography. In order to avoid waste rock rolling onto the access road, it must be transported to the west side of the ridge for dumping. Likewise the only feasible location to store reserve grade material near the upper levels is to prepare an area to the west of the ridge.

Extensions of the present road system will be required to provide access to the 2165 portal and the upper waste dump areas. In addition, considerable tractor work will be needed to prepare a reasonable ore storage area.

Following the ore horizon with the development drifts will not be a simple task. Presently available surface mapping and drill core intersections indicate that some faulting or enechelon structures will probably be encountered. In order to serve the intended

purpose of providing maximum geological and assay data, careful control and some development delays may be necessary.

Determining whether a round of muck should be directed to the ore or waste dump will also be a difficult task. Holding muck while awaiting assays will be awkward with the restricted portal areas, while "on the spot" visual decisions regarding a round's gold content could be very hazardous.

The grade of muck excavated from the ore zones will be considerably less than the drill core grades for two principal reasons:

- (1) The mineralized zone will often not extend across the entire drift width resulting in dilution, and
- (2) The drift will not always be precisely on the ore zone. Therefore some good grade material may be omitted and replaced by waste in that particular round.

As is normally the case in evaluating gold deposits, a combination of channel samples and test holes will provide the basic reserve grade data. Muck rounds, because of their inherent dilution, will serve only as a general check on the overall grades.

An estimated 400 to 600 tonnes of muck from the 2165 drift are expected to assay in the 0.2 to 0.4 oz. Au per tonne range. A few rounds will be higher grade and the remainder will be low grade or waste. The central 2110 drift is expected to produce only a few rounds of reserve grade while the 2060 m development is anticipated to be entirely in waste.

Retrieval of muck from the upper levels ore storage area will not be simple and will involve additional dilution. Restricting the ore to a small compact pile is particularly difficult when faced with the steep local topography. For this reason any serious attempt to conserve the ore excavated from the 2165 m level for subsequent processing should include the prior establishment of an ore pass to a location where storage can be provided in a reliable

manner.

The use of surface facilities such as a chute, tramline or trucks to accomplish the same task were considered, but rejected for various reasons.

DEVELOPMENT DETAIL

The lateral development drifts are assumed to be 3.0m x 2.4m headings with 24 inch vent tubing and 2 inch air and water lines. Safety stations at 30 metre intervals will be required to accommodate scooptrams with 2 yard buckets.

The 2060 raise as shown is at a 50 degree angle and as such could be driven as either an open raise or by utilizing an alimak raise climber. If a raise climber is used, then it would be beneficial to both the contractor and the company to steepen the raise angle and adjust the 2060 drift length accordingly.

The raise cross-section would be 1.8 m x 1.8 m and would be serviced by 2 inch air and water lines.

Some design modifications would be required to properly utilize the ore pass system if it is selected as the preferred alternative. An ore pass connection with the 2165 drive prior to development along the high grade portions of the vein would be the main modification. It would involve relocation of the portal to the south away from the high grade ore.

Respectfully submitted,



Edward S. Holt