Greg / Dave

017590

2459 Thacker Rd.,
Kelowna, B. C.
V1Z 1V9

30 June 1982

Mr. Greg A. Jilson,
Cyprus Anvil Mining Corporation,
300-355 Burrard St.,
Vancouver, B. C.
V6C 2G4

Dear Greg:

Re: C.F. Minerals Research Ltd. - Cyprus Anvil Mining Corp. Joint Venture - Rapid Stream Silt Collecting Device.

Enclosed please find two copies of a progress report on the development of the silt collecting device.

I hope the report conveys the essential information concerned with the project status to date.

Should more information be required, don't hesitate to call me at 604-769-6484.

Yours truly,

Frank C. Moore

Frank C. Moore.

:Encl.

Copy to GAJ.
cc

CYPRUS ANVIL MINING CORPORATION

C.F. MINERALS RESEARCH LTD.

JOINT VENTURE

SILT SAMPLING DEVICE

PROGRESS REPORT

F. C. Moore

30 JUNE 92

CYPRUS ANVIL MINING CORPORATION
C.F. MINERALS RESEARCH LTD.

Silt Sampling Device

Progress Report

INTRODUCTION

Reference: Letter of Intent dated 26 May 1981
Cyprus Anvil Mining Corporation
C.F. Minerals Research Ltd.

1. The letter of intent including the attached Silt Sampling Device Requirements and Specifications provides for "development of a prospecting tool to rapidly and efficiently extract and collect silt and fine sand sized material from active and inactive streams for trace element analysis".

It further provides for "the essence of the concept is to speed sample collection relative to the existing method; to increase use of helicopter and labour without sacrifice of sample quality and to potentially increase recovery of fine heavy minerals".

2. In general, the work has moved through the concept phase where the many alternatives for extracting and collecting a sample have converged on a preferred alternative. This consists of a small portable type engine and pump unit and a shovel like excavator which produces -20 mesh size samples from an excavation profile. A tubular connection as a substitute for the excavator blade can probe holes or cracks but may not be able to produce -20 mesh sediments exclusively. The excavator incorporates a venturii for raising the sample to a sample bag which receives the 10 Kg samples. Water overflowing from the bag is returned to the excavation site for recycling. The overflow can be diverted through a 1 micron filter for collecting micron gold samples.

3. The present state of development is shown in Diagram A in which the main components are identified along with explanatory information.

4. The size constraints which enable two units to be carried in a Hughes Cargo Belly Pod and one or two units in the passenger compartment should be met. However, the weight constraint of 25 lbs. will be difficult to achieve in the current concept. This constraint will be exceeded by about 10 lbs. with the possibility of shaving this in a production version where modifications to "off the shelf" material can include light weight (and more expensive) materials.

5. The development cost constraint of $10,000 has not been exceeded. Approximately $ 4000.00 has been expended on materials, services and travel (for research). Fees totalling $ 5000.00 for design and supervision have been drawn.

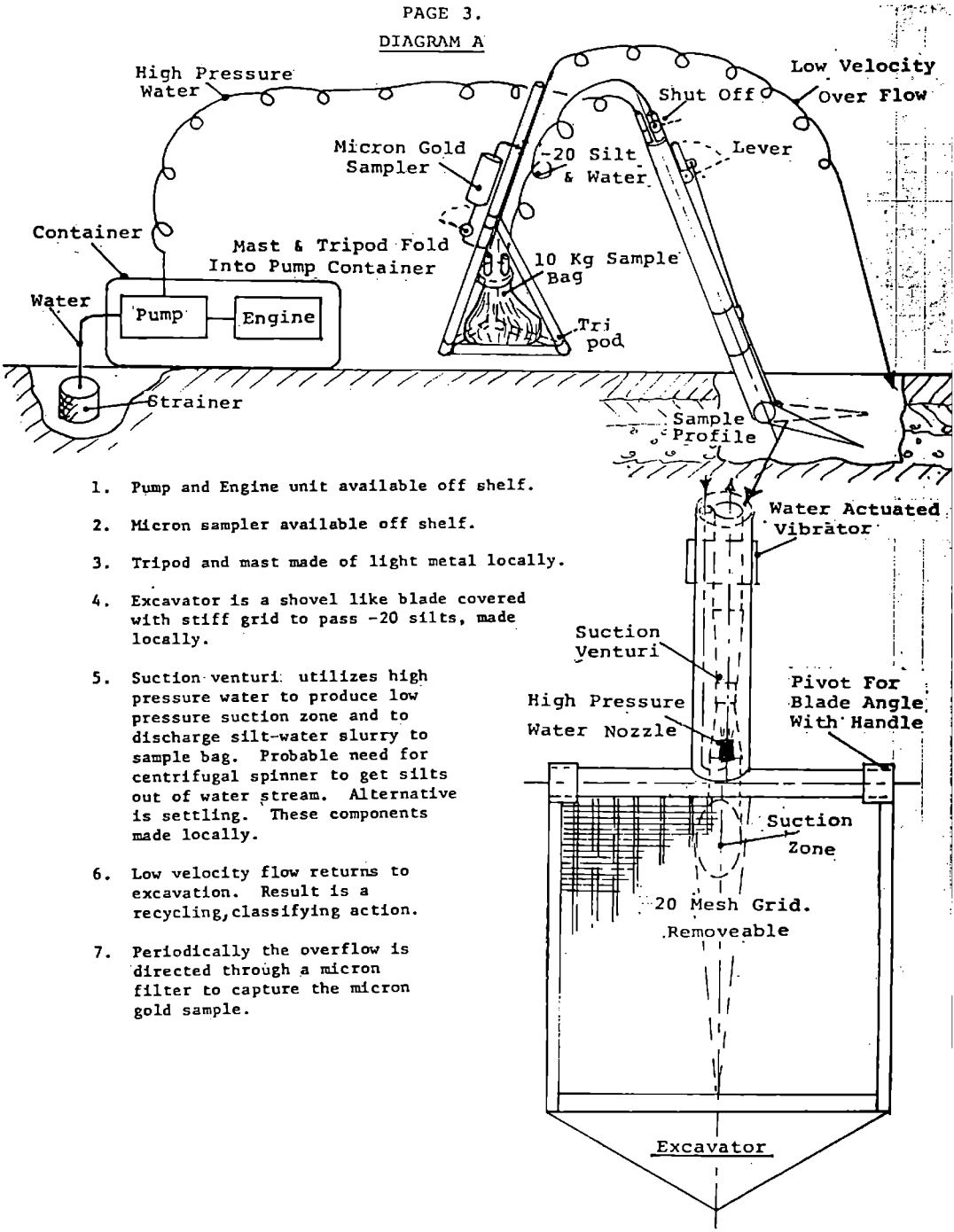
It is likely that development beyond the field trials will require further funding if this development is considered to be justified.

FACTORS CONSIDERED

6. Various alternatives have been considered which have, initially at least, the potential for meeting the constraints.

- An initial patent search did not turn up any worthwhile clues or constraints. This approach was terminated after about 2600 abstracts were identified and it was determined that to copy and examine these would have required about 120 hours of librarian time. A computer search of U.S. patents was made with indifferent results. A better method for doing a patent search would exist at this stage when there is a specific "thing" to compare with what has been patented.

DIAGRAM A

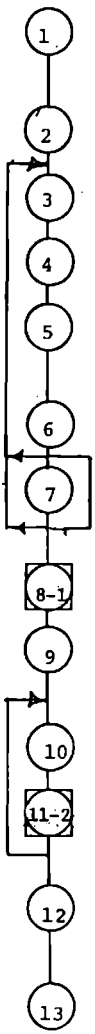


1. Pump and Engine unit available off shelf.
2. Micron sampler available off shelf.
3. Tripod and mast made of light metal locally.
4. Excavator is a shovel like blade covered with stiff grid to pass -20 silts, made locally.
5. Suction venturi utilizes high pressure water to produce low pressure suction zone and to discharge silt-water slurry to sample bag. Probable need for centrifugal spinner to get silts out of water stream. Alternative is settling. These components made locally.
6. Low velocity flow returns to excavation. Result is a recycling, classifying action.
7. Periodically the overflow is directed through a micron filter to capture the micron gold sample.

PROPOSED SAMPLING FLOW PROCESS AS DEVELOPED JUNE 1982

START - Sampling machine unloaded at sample site.

END - Collected sample sealed in shipping bag, machine ready to move to next site.



1 MAKE MACHINE READY - Connect sample bag, hoses, micron filter start engine, prime pump

2 CLEAR OVERBURDEN FROM SAMPLE ZONE TO OPEN SAMPLING PROFILE

3 TURN ON HIGH PRESSURE WATER, DIG, VIBRATE, SUCK -20 MESH SILTS.

4 ADD WETTING AGENT TO EXCAVATION ZONE.

5 DISCHARGE SILT + WATER STREAM TO SAMPLE BAG
SILT SETTLES TO BOTTOM OF BAG.

6 WATER FLOW ROUTED BY HOSE BACK TO EXCAVATION.

7 PERIODICALLY BYPASS WATER OVERFLOW THROUGH MICRON FILTER
TO EXTRACT SAMPLE OF MICRON GOLD

8-1 SAMPLE BAG FULL 10 Kg.

9 REMOVE, IDENTIFY BAG, REMOVE MICRON FILTER, PUT IN BAG,
TIE BAG, IDENTIFY SITE.

10 BACK FLUSH EXCAVATOR & HOSES

11-2 INSPECT EXCAVATOR FOR ADHERING SILT. RINSE CLEAN.
IF NECESSARY.

12 STOP ENGINE, DISCONNECT & COIL HOSES, RINSE PUMP STRAINER
STOW IN PACK.

13 RIG PACK FOR CARRYING OR MOVEMENT TO NEXT SITE.

PERIODICALLY - GAS UP ENGINE, CHECK HOSES & GEAR.

- The physical processes such as streaming currents (air or water) mechanical excavating, tumbling, screening and the natural forces of gravity, inertia, kinetic energy, centrifugal force and properties such as size, shape, specific gravity.

- the "how" of making use of the various processes, forces and properties has included: streaming currents achieved by high pressure small volume and alternatively low pressure high volume pumping, changing of velocity and pressure through use of the nozzle, venturii and vibrator, passing the sediment carrying current over a vibrating screen for removal of -20 mesh silts, recycling of silt carrying water back to the excavation after sieving, by-passing the water which has carried the silts through a 1 micron filter to capture the micron gold sample, passing silt carrying water over a riffle, passing silt carrying water through a closed vibrating chamber in which the entering silts passed above the 20 mesh screen with the -20 mesh silts accumulated below the screen to be drawn periodically into a sample bag and with the water returning to the sampling excavation (see Diagram A).

- Weight and space constraints have been considered in engine, pump and drive systems with selection of a Homelite XL1 chain saw engine, a Hypro 6500 pump (such as used in forestry and agriculture spraying and washing operations), construction of a compact, lightweight variable speed and variable amplitude vibrator, chain drive. The effect of the frame, hoses, valves and the fuel supply has also been considered.

- "off the shelf" availability of components has included engine, pump, chain drive elements. Design and construction has included frame, vibrator, separating chamber (3 versions) excavator, suction strainer for excavator, engine mounting.

special materials have included consideration and use of nylon for nozzles and venturiis, various elastomers for hoses, stainless steel for wetted components, fibre glass and aluminum for structural parts and enclosures, polyethylene for vacuum and centrifugal moulding of enclosures, aluminum for frames and wetted parts, beryllium for light weight parts subject to higher stresses and abrasion (mainly in the excavator).

- in selection or design of components, the "ilities" are questioned. This means that reliability, operability, constructability, maintainability, procurability, transportability and, in this case, cleanability of the various alternatives are questioned.

7. The outcome of these various considerations are shown in Diagram A along with the proposed sampling process.

PROJECT REQUIREMENTS

8. The time, cost and performance constraints are as given in the reference Letter of Intent dated 26 May 1981.

This requires a working device to be field tested and operational by 30 April 1982 pending mitigating circumstances.

It also requires that development costs for the sampling device are not to exceed $10,000 without mutual agreement of the joint venture partners.

9. The operational date has been exceeded mainly due to the difficulty in getting on the track of a concept which would meet the requirements. Also, the design work has not been applied continuously nor could it be as this kind of work involves waiting for information, lack of information which must be generated by trial and error, shop time for trial fittings and components, errors in judgement, etc.

The need for a time extension has been discussed and is now set at 31 July 1982.

10. Accumulated costs are as follows:

Material - including engine, drive and pump, frame variations	$ 1388.60
Services - including industrial shop time	$ 1787.85
Travel - including patent search in Calgary, measurement of Hughes Belly Pod in Vancouver	$ 846.65
Fees - Research, consulting, design 126.75 Hours @ $20.00/hr	$ 2535.00
- Material, search, travel 253.5 Hours @ $10.00/hr	$ 2535.00
TOTAL	$ 9093.00

11. Current emphasis is on the development of the excavator which extracts the -20 mesh silt from the sample site. This is considered to be the most difficult but also the most potentially rewarding of the various component parts of the system.

12. The weight requirement of 25 lbs. will be exceeded by about 10 lbs. in the concept adopted for development.

As the engine and pump assembly are a large part (60%) of this projected weight, there is not much latitude to shave weight in the development version.

Another different and simpler concept could produce a weight break through but this is not in sight.

CONCLUSIONS

1. The time constraints on the conception, designing, developing, constructing of a novel device such as this are essential and have also shown the need for some flexibility.

2. Field trials of a working model should be possible at the end of July 1982.

3. The funds allocated should be sufficient to enable the device to enter the field trials phase.

4. The sampling concept now being developed is shown in Diagram A. The operating method is shown related to that design.

5. The excavator is probably a novel device. Action should be taken to protect the idea.