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Stewart-EBA Consulting Ltd.**Civil, Geotechnical, Materials and Mining Engineers**

CURRAGH RESOURCES LTD.
P.O. Box 1000
FARO, YUKON
Y0B 1K0

October 19, 1990

Attention: Mr. John Zbeetnoff, Field Geologist

Dear John:

RE: DY DEPOSIT SHAFT PILOT HOLE
- CONFIRMATION OF PROPOSED PACKER TESTING PROGRAM

We understand that a 2,173 foot deep borehole has been completed at the proposed Dy Deposit shaft location. It is proposed to carry out permeability tests within the hole by packer testing. Equipment suppliers have indicated a new purchase price of \$10,000 or more for the necessary packer testing equipment. Subsequently we have tried to locate a more economical source of used or rental equipment. I believe a source of suitable rental equipment has now been located.

Equipment costs and details are still being confirmed. Engineering time estimates are approximate only, as the production rates and extent of work will depend to some extent on the field and hydrogeologic conditions.

1.0 PROPOSED PROGRAM

The proposed packer testing program will involve triple (straddle) packer testing in a 2173 ft. deep borehole, at both NQ and HQ diameters. We understand that a suitable pressure pump (water) will be available at the site. Drilling mud must be thoroughly flushed from the hole prior to testing. Residual mudcake deposits may affect results.

1.1 NQ Packer Testing

- A double packer NQ system is immediately available.
- Double packer testing will be used if a triple packer assembly cannot be provided within time constraints.
- Testing to be performed through NQ drill rods with bit attached and inner core barrel assembly removed.



1.2 HQ Packer Testing

- At least five (5) business days following notification are required to manufacture/assemble the HQ packers (shipping time is extra).
- Due to clearance through the drill bit, HQ drill rods and bit must be used for testing. I have yet to confirm whether HQ rods and a reaming shell bit would also meet both clearance and packer assembly seating requirements.

2.0 EQUIPMENT/SUPPLIER

The equipment is tentatively to be supplied by Sinca (Slope Indicator Canada Ltd.) located in Richmond, B.C. (See attached information). Their rental price is not cheap, but is certainly less than purchasing new equipment for a single application. If sufficient other future work is envisaged, we recommend that new purchase should be seriously considered.

Sinca do not have the triple packer and HQ packers (also triple) in stock, but it appears these can be provided on relatively short notice.

The prime feature of this supplier is that they seem to have or be able to supply a complete equipment package. In particular, they supply a hydraulic powered cable reel which will be a great time saver in handling 2200 ft. of air line, which must be removed from the hole between each test. Other equipment required at the site includes:

- Nitrogen bottle.
- Connections from hydraulic cable reel to drill rig hydraulic system.
- Water pump (if required) and connections to stuffing box (stuffing box provided).

3.0 RISKS

As with any down hole testing, particularly where equipment extends beyond the relatively secure protection of the drill string, there is a risk of loss or damage to the testing equipment. Curragh resources must be responsible for damage to, or loss of testing equipment. Typical replacement/repair prices are available upon request.

4.0 PERSONNEL/TIMING

Scott Sylte will coordinate and supervise the packer testing program. He will be assisted in the field by Cord Hamilton. Once the NQ packer testing program is satisfactorily underway,

Mr. Sylte will return to Vancouver, and Mr. Hamilton will complete the remainder of the field program.

Dependent on supply and transport of equipment and travel time, the actual field work may be able to start on Tuesday, October 23. Testing within the NQ portion of the hole will require about 3 days to complete. There may be subsequently several days delay in supply of the HQ equipment to site prior to packer testing within the HQ portion of the hole.

Data analysis will require one to two weeks following completion of testing. Mr. Sylte will be responsible for data analysis and reporting.

5.0 COSTS**5.1 Equipment & Expenses**

-	NQ double packer system	= \$2,000/mo.
-	Upgrade to NQ triple packer system, estimate	\$ 400/mo.
-	Spare parts kit	= \$ 142/mo.
-	HQ triple packer assembly, estimate	= \$1,400/mo.
-	Air Transport of equipment, Vancouver to Whitehorse, @ \$1.68/kg, (one way). estimate 600 kg	= \$2,016.00
-	Airfare, Vancouver to Whitehorse (return)	= \$ 886.00
-	Accommodation, meals, transport other than above, incidentals, estimate	= \$1,200.00
	TOTAL EQUIPMENT AND EXPENSES	= \$8,044.00

5.2 Professional Fees**Mobilization and Demobilization, estimate**

S. Sylte	20 hrs @ \$70/hr	= \$1,400.00
C. Hamilton	10 hrs @ \$60/hr	= \$ 600.00

Field Program, estimate

S. Sylte	18 hrs @ \$70/hr	= \$1,260.00
C. Hamilton, (NQ Hole),	18 hrs @ \$60/hr	= \$1,080.00
" " (HQ Hole),	24 hrs @ \$60/hr	= \$1,440.00

Analysis & Reporting, estimate

S. Sylte, (NQ Hole),	24 hrs @ \$70/hr	= \$1,680.00
" " (HQ Hole),	8 hrs @ \$70/hr	= \$ 560.00
C. Hamilton,	8 hrs @ \$60/hr	= \$ 480.00

TOTAL PROFESSIONAL FEES = \$8,500.00

5.3 Total Costs

With more lead time, the costs of shipping equipment and perhaps the supply of equipment, could be reduced. Cost will depend on the extent of the work.

ESTIMATED TOTAL		
NQ Diameter Testing		= \$12,400.00
ESTIMATED ADDITIONAL COST		
HQ Diameter Testing		= <u>\$ 4,144.00</u>
TOTAL		= <u>\$16,544.00</u>

6.0 CLOSING

We are happy to proceed with this project pending your approval of this cost estimate. It is recommended that if the HQ packer testing program is adopted, packer (permeability) tests be conducted at/near the upper fault zone. This will help in the interpretation of data from a pumping test which is planned at a later date for this portion of the drillhole. If you have any questions or comments related to the proposed program as outlined above, please contact the undersigned.

Respectfully submitted,

Have ph: (609) 987-1514
S.A. Sylte

S.A. Sylte, P. Eng.

EBA Engineering Consultants Ltd./Stewart-EBA Consulting Ltd.

cc: R. Trimble



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10/18/90 12:36

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604 276 0190

SINCR LTD.

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FAX TRANSMISSION

SLOPE INDICATOR CANADA LIMITED
#240 - 11300 River Road, Richmond, B.C. Canada V6X 1Z5

PHONE: (604) 276-2545

WATS: 800-663-2374

FAX: (604) 276-0190

DATE: October ¹⁸ 17, 1990

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FAX: 684-6241

FROM: Larry Theriault

COMPANY: Stewart EHA

REFERENCE: Packers

ATTENTION: Scott ~~SITE~~ *Sythe*

FOLLOW UP IN MAIL yes no

If there is a problem with this transmission, please contact (604) 276-2545
mission

Dear Scott:

As per our discussion please find enclosed literature on the packers system.

Please note that the Hydraulically Driven Composite Cable Reel has capacity 2400 feet of composite line. As well the hydraulic reel has two ten foot long hydraulic lines to be attached to the drill rig hydraulic system.

However we are not certain as to the exact length of composite cable on the reel. We will advise shortly, as soon as we ascertain the length.

Will advise shortly on the HQ straddle zone packers (price, availability, ect).

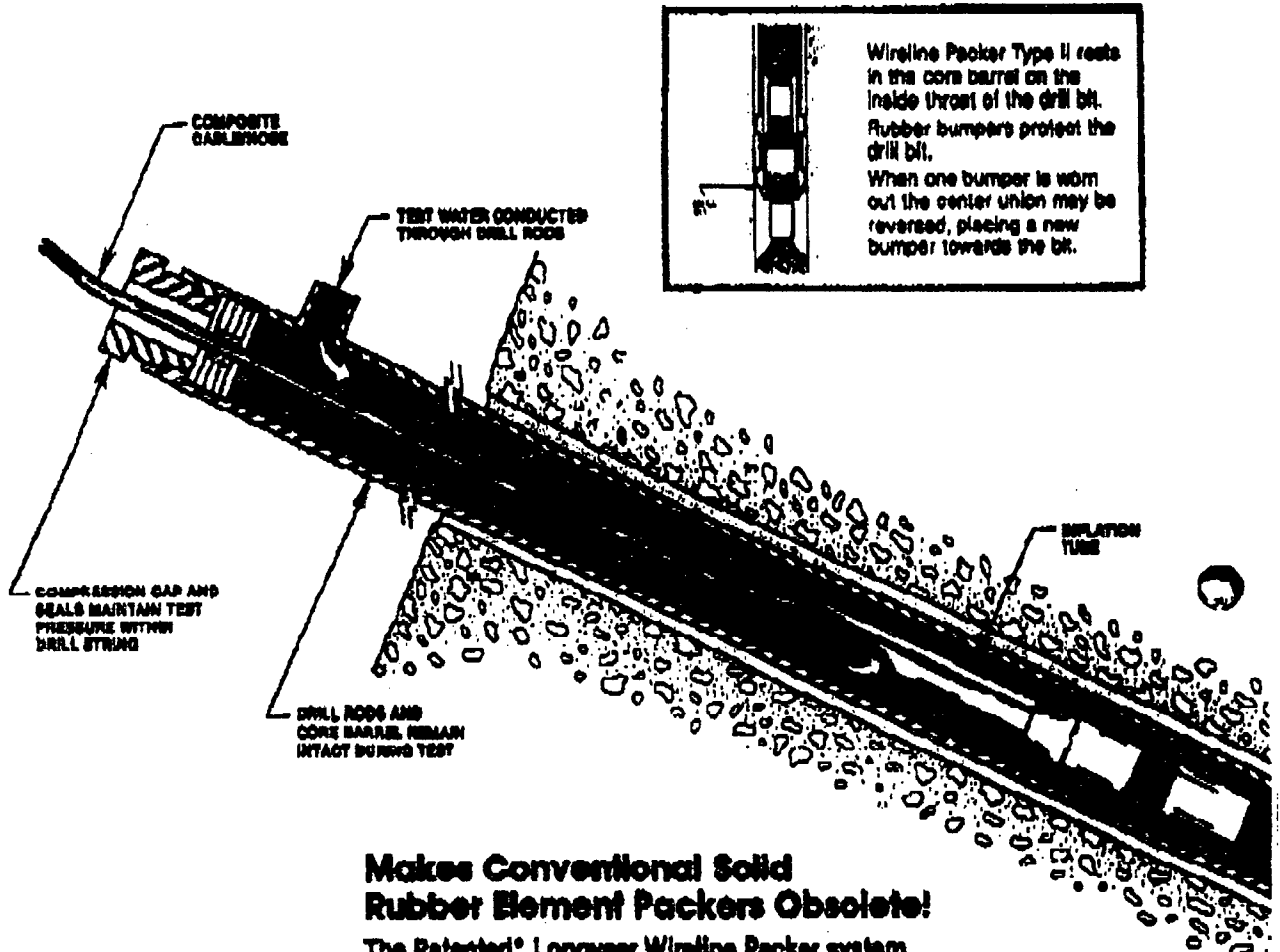
Item	Qty	Description	Price
01	1	Packer Gland. NQ size.	\$978.00 (cost if damaged)
02	1	Wireline Packer System, Double packer. c/w Hydraulic Composite Cable Reel, two ten foot hydraulic lines, inflation kit consisting of nitrogen regulator, three way valve, jumper hose and quick connects, water pressure gauge, water volume gauge (flowmeter), NQ stuffing Tee, 2000 feet of composite line.	\$2000.00 per month
03	1	Spare parts kit.	\$142.00 per month

Notes:

Canadian funds.
Quote valid until 1 February 1990
Availability: on shelf.
All taxes out.

The Longyear Wireline Packer Type II

A Longyear Development for Permeability Testing



Wireline Packer Type II rests in the core barrel on the inside throat of the drill bit. Rubber bumpers protect the drill bit. When one bumper is worn out the center union may be reversed, placing a new bumper towards the bit.

Simplicity/Efficiency
Reliability/Versatility
Convenience/Productivity

Makes Conventional Solid Rubber Element Packers Obsolete!

The Patented* Longyear Wireline Packer system

- is available in 3 sizes — NQ, HQ and PQ.
- is designed specifically for the Longyear NQ, NQ-3, HQ, HQ-3, PQ and PQ-3 core barrels of any length.
- eliminates time-consuming and costly need to remove drill string every time testing is to be done.
- preserves drill hole, especially in unstable conditions.
- employs a unique composite cable/hose for lowering, retrieving and inflating the packer.
- features steel reinforced gland elements for exceptional strength and long life.
- can be quickly converted into a straddle zone packer which allows testing of a specific zone.

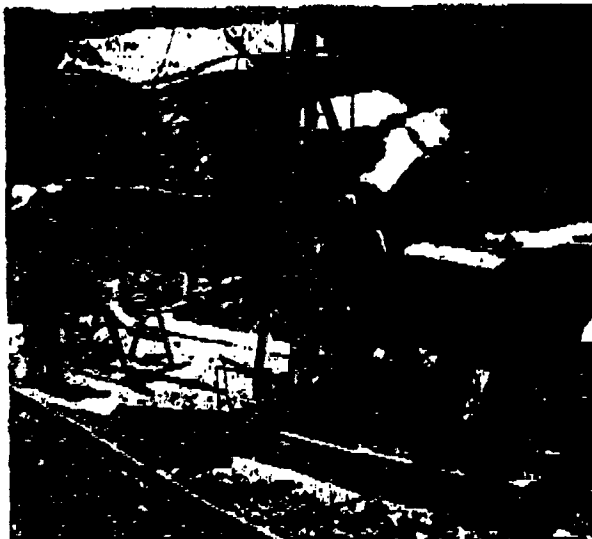
*U.S. PATENT 4,257,602. CANADIAN PATENT 1,100,163.

A complementary accessory to Longyear's NQ, HQ and PQ Series Wireline Systems, the Wireline Packer Type II offers increased productivity during permeability testing operations.

The Wireline Packer Type II becomes part of the Series Q Wireline System which Longyear originated more than 20 years ago. Improvements made over the years have kept the Q system the most productive and reliable wireline string in the world. Features such as the "Knuckle Head" Pivoting Spearhead, compact overshot, fast descent inner tube, full grip rod wrench, high strength heat treated Q drill rod, and high strength light weight CQ drill rod keep the Longyear Series Q Wireline System's quality, productivity, efficiency, versatility, reliability and safety unique in the industry.

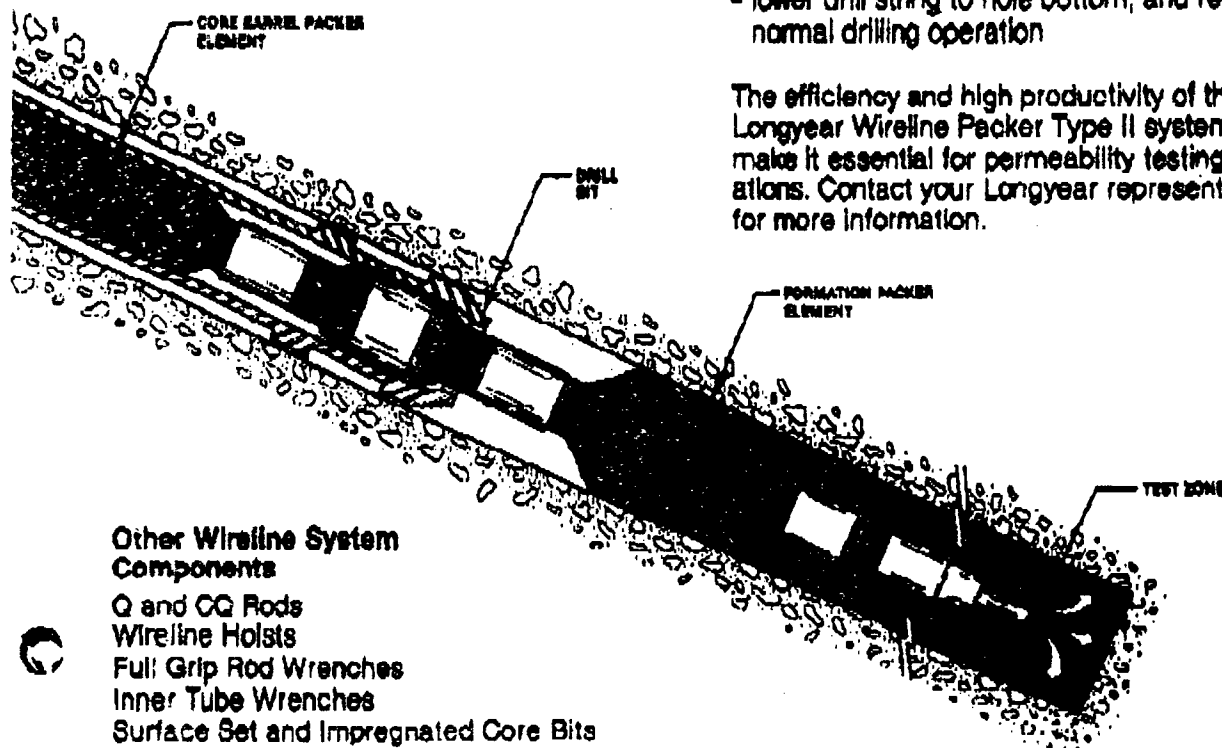
Compare the efficiency of this total permeability testing system with the previously standard, laborious method. Using the Wireline Packer Type II with a Q Series Wireline Core Barrel is simple and time-saving.

- remove inner tube assembly
- raise string off bottom, leaving the desired test zone below the bit
- install seal tee assembly
- lower packer assembly into core barrel
- tighten compression cap



- connect composite cable to surface source of compressed air or inert gas and inflate packer glands
- conduct permeability test
- deflate packer glands
- remove packer assembly and seal tee
- lower inner tube assembly
- lower drill string to hole bottom, and resume normal drilling operation

The efficiency and high productivity of the Longyear Wireline Packer Type II system make it essential for permeability testing operations. Contact your Longyear representative for more information.



Other Wireline System Components

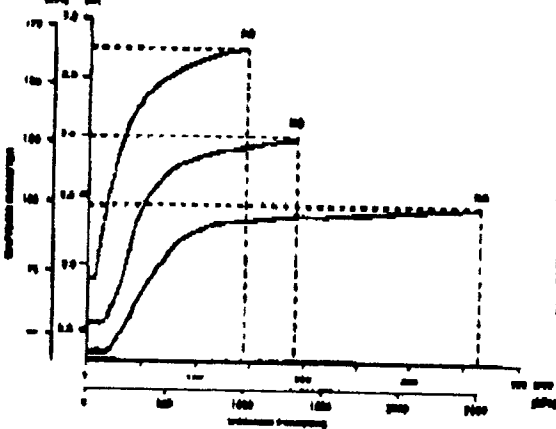
- Q and CQ Rods
- Wireline Holsts
- Full Grip Rod Wrenches
- Inner Tube Wrenches
- Surface Set and Impregnated Core Bits

Specifications for Wireline Packer Type II

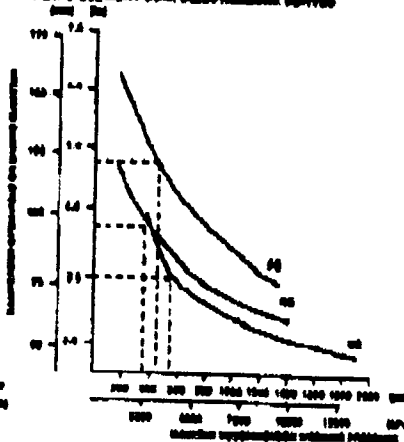
	HQ Wireline Packer	HQ Wireline Packer	PQ Wireline Packer
PACKER ASSEMBLY COMPLETE			
Part number	48215	48228	51409
Overall length	86 in (2235 mm)	92 in (2337 mm)	93 in (2362 mm)
Overall weight	18 lb (8.2 kg)	26.3 lb (11.9 kg)	43 lb (20.4 kg)
Center tube I.D.	.510 in (13 mm)	1.0 in (25.4 mm)	1.38 in (35.1 mm)
Maximum working pressure* (Unconfined)	360 psi (2480 kPa)	185 psi (1275 kPa)	146 psi (1000 kPa)
GLAND ELEMENT			
O.D. — deflated (min)	1.00 in (42 mm)	2.19 in (54 mm)	2.89 in (72 mm)
O.D. — expanded (max)	3.95 in (100 mm)	5.0 in (127 mm)	6.30 in (165 mm)
COMPOSITE CABLE			
O.D. (7/16")	.44 in (11.1 mm)		
WIRELINE CABLE (COMPONENT)			
O.D. (3/32")	.09 in (2.4 mm)		
Lifting capacity	980 lb (436 kg)		
NYLON INFLATION TUBE (COMPONENT)			
O.D. (3/16")	.18 in (4.76 mm)		
Working pressure	2600 psi (17 830 kPa)		

*Specifications are subject to tolerances and are therefore approximate.
 *Working pressure = (Regulator inflation pressure) - (in hole water pressure)

GLAND ELEMENT UNCONFINED EXPANSION CURVES



GLAND ELEMENT COMPRESSURE CURVES



Accessories

STRADDLE ZONE CONVERSION KIT

Standard packer assembly may be used for straddle zone testing.

The kit provides a third packer gland that is added below the borehole packer gland and connected by perforated tubing the length of the required test zone.

SKID MOUNTED WIRELINE HOIST

Gasoline powered

Part number	39720 Mod. 1324
Drum capacity	600 ft (244 m) with 7/16 in composite cable
Diameter	7 1/4 in (182 mm)
Length	17 in (432 mm)
Line speed (bare drum)	185 fpm (59 mpm)
Length	39 1/4 in (997 mm)
Width	35 in (889 mm)
Height	32 1/4 in (820 mm)
Weight	435 lb (198 kg)
Quick disconnect fitting	1/2 in NPT



Longyear is constantly striving to improve its products and therefore reserves the right to change design, materials, specifications and price without notice.