PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

P225101

CONSTRUCTION REPORT
VANGORDA REHABILITATION
PWGSC PROJECT 760831
VANGORDA PLATEAU, FARO MINE
YUKON TERRITORY

SRK - ROBINSON INC.

Consulting Engineers

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P225101

CONSTRUCTION REPORT VANGORDA REHABILITATION PWGSC PROJECT 760831 VANGORDA PLATEAU, FARO MINE YUKON TERRITORY

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1.0 INTRODUCTION

1.1 General

Public Work and Government Services Canada (PWGSC) contracted Pelly Construction Limited (PCL) of Whitehorse, Yukon Territory to complete works associated with the rehabilitation of the existing Vangorda mine rock containment facility located at the Vangorda Plateau, Faro Mine, Yukon Territory. A general plan of the Vangorda Plateau is shown on Figure P2251001. SRK-Robinson Inc. (SRKR) was retained by PCL as the design consultant. The work primarily involved the upgrading of an existing seepage collection system located around the perimeter of the containment facility, recontouring slopes within a section of the rock pile, and providing instrumentation to monitor both the physical stability of the rock pile and any impact on groundwater quality. This report presents a discussion on the field design changes and procedures that took place during construction.

1.2 Description of Responsibilities

The responsibilities for design, construction, surveying, groundwater well installations and inspections are described in the following sections.

1.2.1 Design

SRK-Robinson Inc. was responsible for the design of the following components:

seepage collection channel;

- recontouring of the existing rock pile slopes;
- groundwater well sand piezometers; and
- seepage monitoring weirs.

1.2.2 Construction

Pelly Construction Limited (PCL) was responsible for the construction of the seepage collection channel, recontouring of the rock pile slopes, installation of the groundwater wells and piezometers. Survey work associated with both the channel construction and the resloping was carried out by Yukon Engineering Services (YES). Midnight Sun Drilling (MSD) installed the groundwater monitoring wells and the piezometers.

1.2.3 Inspection Services

Inspection services were provided by SRKR and EBA Engineering Ltd. SRKR had technical control of the channel construction and rock slope recontouring and inspected the works periodically during construction. EBA provided fulltime inspection of the groundwater well and piezometer installations.

1.3 Background

In May 1990, SRK conducted a geotechnical investigation of the area in preparation for the design of the mine existing rock containment facility. Test pits were excavated along the alignment of the original seepage collection ditch. The locations of these test pits and the results of the investigation were provided in the final design report issued in March, 1994.

Other geotechnical data from the area consisted of test pit logs and laboratory test results completed by Montreal Engineering Company, Limited (Moneco) in 1977, EBA Engineering Consultants Ltd. in 1990 and Piteau Associates Engineering Limited in 1992. Extracts from these reports were also provided in the design report.

1.4 Drawings

Drawings (D-size) of the work completed work at the site have been prepared and provided as part of this report. Reduced copies of these drawings are included at the back of the report.

3.0 DESIGN CHANGES

3.1 Seepage Collection Channel

3.1.1 General

During the construction of the seepage collection channel, several modifications to the original design were required due to soil conditions encountered during the excavation. The following sections discuss each of the design changes in more detail.

3.1.2 Rock Excavation

During the excavation of the channel phyllitic bedrock was encountered above the channel subgrade from Station 0+100 to 0+320. The original design had estimated that the bedrock would be encountered between 0+100 and 0+250. In accordance with the design, the bedrock was overexcavated to a depth of 0.5 m below the design subgrade level in preparation for sealing with compacted till. It was noted, however that in places the bedrock extended all the way to the original ground and not as originally estimated to within 1 to 1.5 m of the original ground. As a result, till placement on the sideslopes was limited to a maximum height of 2 m vertically above the topside of the till blanket, along the channel base. Rock fill was placed over the till blanket but did not extend to the crest of the channel where bedrock was exposed all the way up the sideslope.

3.1.3 Upstream Sediment Control Berm

In order to control sediment migration from the till berms into the channel, a small berm of blasted rock was constructed along the uphill crest of the channel from STA 0+100 to 0+750. The height of the berm was about 0.45 m.

3.1.4 Overexcavation (STA 0+870 to 0+920)

Between STA 0+870 and 0+920, the new channel intercepted the original ditch and the spoil used to backfill the ditch formed and the uphill sideslope of the new channel. It was found that the backfill material contained frozen soil that was considered unsuitable foundation for the rock fill cover. Tension cracks were observed along the section of the channel in this area, which were indicative of settlement due to thawing of the backfill. As a result of these observations, it was decided to overexcavate the material in this area and backfilled with shot rock from the quarry.

3.2 Groundwater Monitoring Wells

Modifications to the original program presented in the final design report were made in the field to improve detection of any seepage losses from the channel and to assess any impact on the regional groundwater table. A discussion of these changes is presented below.

- The modifications to groundwater wells GW-94 -01 to GW-94-04 involved installing the wells to a maximum depth of about 15 m or to 4 m below the water table, whichever occurred first. If the water table was encountered, the sand pack was to extend no more than 1 metre above the screen. If no water was encountered the sand pack was to extend to no more than 10 m above the screen to intercept any seepage from the channel. The well screens were also reduced from 3 m to 1.5 m.
- The modification also involved the installation of an additional well (GW-94-05) downgradient from Well GW-94-03, between the channel and the Vangorda Creek. This well was to be located as far down the hill as possible to minimise drilling cost and was to be drilled until the water table was intercepted.
- The modification to the piezometer installations involved reducing the well screen in each well from 3 m to 1.5 m and extending the pipe to no more than 4 m below original ground.

3.3 Seepage Monitoring

A preliminary design for a flow monitoring was included in the final design report. Following discussions with Bud MacAlpine of Water Resources, modifications to the seepage monitoring concept was made. It was agreed that v-notch weirs would be installed at three of the finger drains instead of one weir at the end of the collection channel. The weirs would be located at the outlets to fingerdrains 3, 5 and 6. The weirs would consist of a steel plate about 8 feet by 4 feet square installed across the channel and embedded about 3 feet into the ground. A v-notch would be cut into the steel plate with a 90° angle. The notch would be at least 300 mm deep and would be positioned at least 300 mm above the ground. The weir would be located on a steep section of the channel to minimize ponding.

3.4 Waste Rock Resloping

In the original design, it was hoped that at least three zones (A, B and C) in the existing waste rock pile would be recontoured and that a test area on Zone A would be covered with till. It was recognized that this phase of the work was subject to available funds. On completion of the seepage channel, the groundwater well and piezometer installation, the remaining funds limited work on the rock pile to resloping a 190 m wide section in Zone A from STA 0+150 to STA 0+340 and placing a 2 m thick cover of compacted till over an area from STA 0+150 to 0+220.

4.0 FIELD AND LABORATORY TESTING

4.1 General

Compaction tests and gradation analyses were completed during the construction by EBA. Modified Procter tests were completed on representative samples of the glacial till that was used to seal the exposed phyllite rock along the channel from STA 0+100 to 0+320 and to cover the resloped rock on the pile. EBA completed a gradation analysis on a sample of the till used as a seal for the channel and on a representative sample of the rock fill that was placed over the exposed subgrade till in the channel.

4.2 Channel Base Seal

Glacial till was placed to a depth of 0.5 m to seal the exposed phyllite from STA 0+100 to 0+320. A Standard Proctor compaction test performed on a sample of the till used for the seal indicated a maximum dry density of 2020 kg/m³ with an optimum moisture of 12 percent. Results of the test are presented in Appendix B. As the Standard Proctor produces a lower density than the Modified, the required degree of compaction was raised to 98 percent

4.3 Rockpile Till Cover

A Modified and a Standard Procter test were performed on sample of the glacial till used to cover the rock slope on the waste rock pile. The results were 2230 kg/m³ for the Modified test and 2115 kg/m³ for the Standard test. Details of these tests are provided in Appendix B.

4.4 Blasted Rock Cover

Blasted rock from a quarry established near the site was used to provided erosion protection of the channel sideslope. EBA performed a sieve analysis on a representative sample of the rock material to determine compliance with the design specifications. The results ($D_{50} = 140 \text{ mm}$, $D_{90} = 250 \text{ mm}$ and $D_{15} = 75 \text{ mm}$) indicated that the material was acceptable and would meet the performance requirements.

5.0 CONSTRUCTION PROCEDURES

5.1 General

Construction activities on the site commenced in March 1994, with clearance of the snow in the area between the original ditch and the toe of the waste rock pile. Snow and ice were also removed from the ditch and from the top of the spoil stockpile along the western perimeter of the site. Activities included construction of the seepage collection channel, installation of the groundwater monitoring wells, connecting the fingerdrains into the channel, resloping of a section of the waste rock pile and placing a 2-metre thick cover over a zone of the resloped area. SRKR provided technical control and periodic inspection of the construction activities. Select photographs of

key aspects of the construction are included in Appendix C. The following sections present a discussion of the construction activities.

5.2 Seepage Collection Channel

5.2.1 Clearing and Snow Removal

PCL began clearing snow from the area between the original ditch and toe of the waste rock pile in March 1994. They also commenced snow removal from the ditch and from the spoil stockpile. The snow removal above the ditch was necessary to avoid delays in excavation of the main channel due to runoff from the snowmelt. The snow and ice was cast over the bank below the existing access road.

5.2.2 Foundation Preparation

On completion of the snow removal, PCL commenced backfilling of the original ditch between STA 0+700 and 1+000 which was done to provide a working platform for the excavation of the deeper sections of the new channel. The backfill material consisted of the glacial till that had been stockpiled along the western edge of the original ditch. Although the material contained pockets of frozen soil, all snow and ice was removed from the soil before placement.

5.2.3 Excavation

On completion of the backfilling of the original ditch, YES carried out an initial survey of the ground surface along the alignment of the new channel and established grade stakes for the excavation. PCL commenced excavation of the channel at the end of March using a Cat 235 excavator and a D-10 bulldozer. Subexcavation of the phyllite rock between STA 0+100 and 0+320 also started. By April 12, 1994, 40 percent of the bulk excavation along the channel had been completed including the subexcavation of the bedrock. YES completed a final survey of the rock subcut on April 8, 1994.

Between Station 0+870 and 0+910, spoil used to backfill the original ditch on the uphill side was excavated and backfilled with shot rock to provide a stable sideslope for the new channel. At the same location but on the opposite sideslope, a small area of peat was encountered between Station 0+880 and 0+900, which would also form

part of the channel sideslope. The peat was considered unsuitable for foundation material below the rock cover and was removed prior to placing the rock cover.

The frozen till that had been used to backfill the original ditch from Station 0+685 to 0+715 had softened due to thawing and as this material would form the uphill sideslope of the new channel, it was removed and replaced with shot rock.

By mid May, the entire channel had been excavated and YES had completed a final survey of the subgrade till surface.

Review of the as-built sections along the entire length of the channel, indicated that generally the till surface had been excavated to the lines and grades shown on the design drawings. However, there were some areas where the excavation had extended beyond the design limits. The total volume of till excavated was calculated from these sections and was found to be in the order of 43,000 m³. However, it was agreed between PCL and GSW that the till excavation quantity would be used for payment would be calculated on the basis of the design till line and the original ground. The volume calculated for payment was 37,461 m³.

The final alignment of the channel is shown on the site plan in Figure P2251002 and on the detailed plan and profiles shown in Figures P2251003 to P2251006. Typical sections through the channel are presented in Figures P2251007 to P2251009.

5.2.4 Channel Base Seal

Placement of the glacial till seal over the subcut phyllite bedrock from STA 0+100 to 0+320 began on April 15, 1994 and was completed by April 27, 1994. Based on a gradation test performed by EBA, the material contained 54 percent clay and silt, 33 percent sand and 13 percent gravel. The till was placed in two 25 cm lifts and compacted by a sheepsfoot roller to the compaction specifications of 93 percent of the Modified Procter maximum dry density which is equivalent to 98 percent of the Standard Proctor maximum dry density. Density tests were performed by EBA on the compacted till using a nuclear densimeter. Results of the compaction and density tests including the gradation analyses are presented in Appendix B of this report. A profile along the subcut and the till seal along the centreline of the channel is presented on Figure P2251003.

5.2.5 Rock Cover Placement

Following approval by the GSC inspector, PCL began placing the shot rock cover over sections of the excavated subgrade that were prepared. This work commenced on April 11, 1994 and was completed by June 9, 1994. The shot rock was obtained from a quarry that was established by PCL specifically for this project at allocation shown on Figure P2251001. The material consisted primarily of a dark green, medium grained, altered gabbro. The purpose of the rock cover was to provide long term erosion protection of the underlying till and also to provide adequate passage of the seepage from the fingerdrains. The material was hauled to the site from the quarry using two 769 rock trucks and was placed by the Cat 235 excavator. In places, the D-10 was also used to spread the material. No compaction of this material was required.

The shotrock cover was generally placed at, or in excess of, the required 0.45 m above the till base and the slope of the cover conforms with the design requirement of 3:1 (Horizontal to Vertical). While the gradation of the shotrock is finer than expected, SRKR believes the channel will function as designed and will direct seepage flow from the fingerdrains into Little Creek Pond. The volume of shotrock placed in the channel was calculated based on survey data provided by YES and amounted to about 17,000 m³. As the thickness of the shotrock exceeded the design thickness in many places, it was agreed that the quantity of rock that would be used for payment would be based on 0.45 m above the as-built till surface. The shotrock volume for payment amounted to 10,902 m³.

The depth of the rock cover along the alignment of the channel is shown on the profiles presented in Figures P2251003 to P2251006.

5.2.6 Fingerdrain Plugs

Where the original fingerdrains extended beyond the new channel, the drainrock in the drains was removed and backfilled with compacted glacial till to seal the channel and prevent potential leakage to the environment.

5.3 Waste Rock Resloping and Till Cover

5.3.1 Resloping

Resloping of Zone A of the Vangorda waste rock pile began on May 6, 1994 using a D10 bulldozer. By May 13, 1994, waste rock on the south side of the rockpile had been resloped between STA 0+150 and 0+220 to an angle of about 20° (2.7:1) The resloping was initiated at a point about 10 m below the top of the rock pile and feathered out on the crest of the till berm below. By May 19, 1994 the resloping had advanced to STA 0+340 and the section from STA 0+150 to 0+220 had been flattened to 18° (3:1). As funds for the project, at that time were close to the maximum allocated for this phase of the work, no further resloping was done. Placement of the till cover was initiated. As payment for the resloping was based on machine time only, no measurement was made of the volume of rock recontoured. However, based on the initial survey data used in the design report, it was estimated that about 40,000 m³ of material was resloped.

5.3.2 Till Cover

The placement of a two metre till cover over the recontoured waste rock began on June 1, 1994. Because the funds remaining in the budget were limited, the extent of the cover was confined to STA 0+150 to 0+220. The till for the cover was obtained from a stockpile that was located at the east end of the rockpile as shown on Figure P2251002. The cover was constructed in four 0.5 m thick lifts and compacted with a sheepsfoot roller to the required 93 percent of the Modified Procter maximum dry density or 98 percent of the Standard Procter maximum dry density. Density tests of the compacted till were completed by EBA using a nuclear densometer. Results of the density tests are presented in Appendix B. A total of 15,730 m³ of till was placed over an area of about 8000 m². Typical sections through the cover and the resloped rock are presented on Figure P2251010. A perspective view of the till cover and recontouring of the slopes is shown on Figure P2251011.

6.0 INSTRUMENTATION

6.1 General

During the construction of seepage channel and the resloping of the rock pile, permanent instrumentation was installed to monitor the seepage flow from the rock pile, potential seepage losses from the channel and piezometric heads that may develop in the existing till berm around the rock pile. The following sections discuss the types of instrumentation installed and the methods of installation.

6.2 Groundwater Wells and Piezometers

A total of five groundwater wells and nine piezometers were installed by EBA and Midnight Sun Drilling (MSD) utilizing a CME 750 auger drill from April 20 to May 1, 1994. Both solid shaft and hollow stem augers were used during drilling. Water was encountered in all the monitoring wells, however, the piezometers were all dry. A summary of well installation information is presented in Table 1. Essentially all wells were installed according to the design specifications. However, some minor installation changes and modifications were necessary due to variable field and soil conditions. Some of the well depths varied because the drill utilized could not penetrate the dense till at lower depths. It was also noted that most of the wells were placed in seasonally frozen ground and consequently the Puregold bentonite grout may not have set-up properly. Also some of the protective wellhead casings had slid into the hole as the ground thawed.

On June 10, 1994, all the wells were inspected, repaired, and re-levelled as required. Also, all threaded caps were replaced with friction fit (pull off) caps, and 50 mm diameter water bailers/samplers were suspended inside each well with braided nylon rope, to facilitate future sampling. A second set of water level readings in all monitoring wells were taken on June 21, 1994 by EBA and are presented on Table 1.

All material quantities, drilling times and individual well details are shown on the borehole logs presented in Appendix C.

TABLE 1 Vangorda Waste Rock Containment Facility - Faro, Y.T. Groundwater Wells and Piezometer Installation Summary

Well No.	Stickup above Ground Elevation	Depth from Top of Pipe	Depth to Static Water Level	Depth to Static Water Level	Ground Elevation	Coord (Mine	dinates Grid)
	(m)	(m)	May 3, 1994 (m)	June 21, 1994 (m)	(m)	North	East
P94-01A	0.61	12.37	no water	N/R	1136.555	10014.802	8893.956
P94-01B	0.61	6.05	no water	N/R	1136.493	10013.012	8894.394
P94-02A	0.53	10.72	10.57 (bailed empty)	N/R	1138.410	10157.070	8935.215
P94-02B	0.56	6.12	no water	N/R	1138.332	10155.070	8933,309
P94-02C	0.61	13.34	13.08 (bailed empty)	N/R	1129.840	10137.120	8888.761
P94-03A	0.61	14.10	no water	N/R	1134.373	10188.741	9245.064
P94-03B	0.61	9.80	no water	N/R	1134.459	10187.816	9248.427
P94-04A	0.61	12.70	12.17 (bailed empty)	N/R	1134.609	10142.198	9448.836
P94-04B	0.61	8.99	no water	N/R	1134.326	10145.418	9442.209
,							
GW94-01	0.58	12.80	8.28	7.45	1117.445	9782.317	8945.534
GW94-02	0.53	15.70	14.33	8.65	1117.405	10008.160	8810.969
GW94-03	0.64	11.94	11.28	9.15	1118.431	10306.670	9020.492
GW94-04	0.54	14.48	14.33	9.65	1116.165	10310.048	9261.925
GW94-05	0.76	16.13	11.56	See Note 5	1101.673	10396.139	9083.394

Notes:

- All depths measured from top of pipe
 Water levels were measured on May 3, 1994
- 3. Piezometers containing water were bailed dry
- 4. N/R = Not Recorded
- 5. Artesian conditions cause water to spill over the pipe.

6.3 Flow Gauges

A total of 3 v-notch weirs were installed at the outlets to Fingerdrains 3, 5 and 6. The weirs consist of a steel plate about 2.4 m by 1.2 m square installed across the outlet and embedded about 1 m into the ground. A v-notch was cut into the steel plate with a 90° angle. The notch was about 30 cm deep and was positioned at least 30 cm above the ground.

Flows recorded at each of the weirs by DIAND and PWGSC are presented in the following table:

Weir at	July 13, 1994 (L/min)	August 10, 1994
Fingerdrain No.	1.470.0	(L/min)
3	1	3
5	1.5	0.6
6	2	10.2

7.0 POST CONSTRUCTION OBSERVATIONS

In September 1994, mine site personnel observed tension cracks which had developed along a 50-metre section of an extension to the access road constructed alongside the seepage collection channel from STA 1+240 to 1+290. SRKR inspected the cracks during a site visit to Faro mine site on September 12, 1994. At that time, the cracks extended longitudinally along the 15 metre wide berm. The tension cracks were, in places, 30 cm wide and extended about 1.5 m deep. At one location, the crack is within 5 m of the downstream crest of the new channel. However, there was no structural damage to the channel itself. The maximum thickness of the berm at this location is about 3 to 4 m.

We understand that the cracks developed in late June, 1994 following placement of additional fill by PCL on the downhill side of the original berm in mid June, 1994.

The fill used had been stockpiled along the outer crest of the original berm and was pushed out over the edge and compacted with a sheepsfoot compactor. This material had been originally excavated during construction of the channel. SRKR understands that during the initial stages of the project, snow in the original seepage collection ditch was removed and cast over the downhill side of the original berm. The snow was then covered over with material excavated from the channel.

On October 4, 1994, SRK again inspected the berm during another site visit to Faro. It was noted that although there was no horizontal movement of the toe, in places the ground had settled about 1 metre and there was seepage discharging from the toe.

On the basis of these observations, we believe that the settlement of the fill and the observed seepage are directly related to the thawing of the underlying snow. We also believe that the settlement of the fill will continue but at a decreasing rate and will likely not impact the new channel. It is our opinion that no remedial action is required at this time. However, the settlement should be monitored on a regular basis by the new mine owner. At the beginning of next years construction season, sufficient consolidation will have occurred and the resulting depression can be backfilled and recompacted.

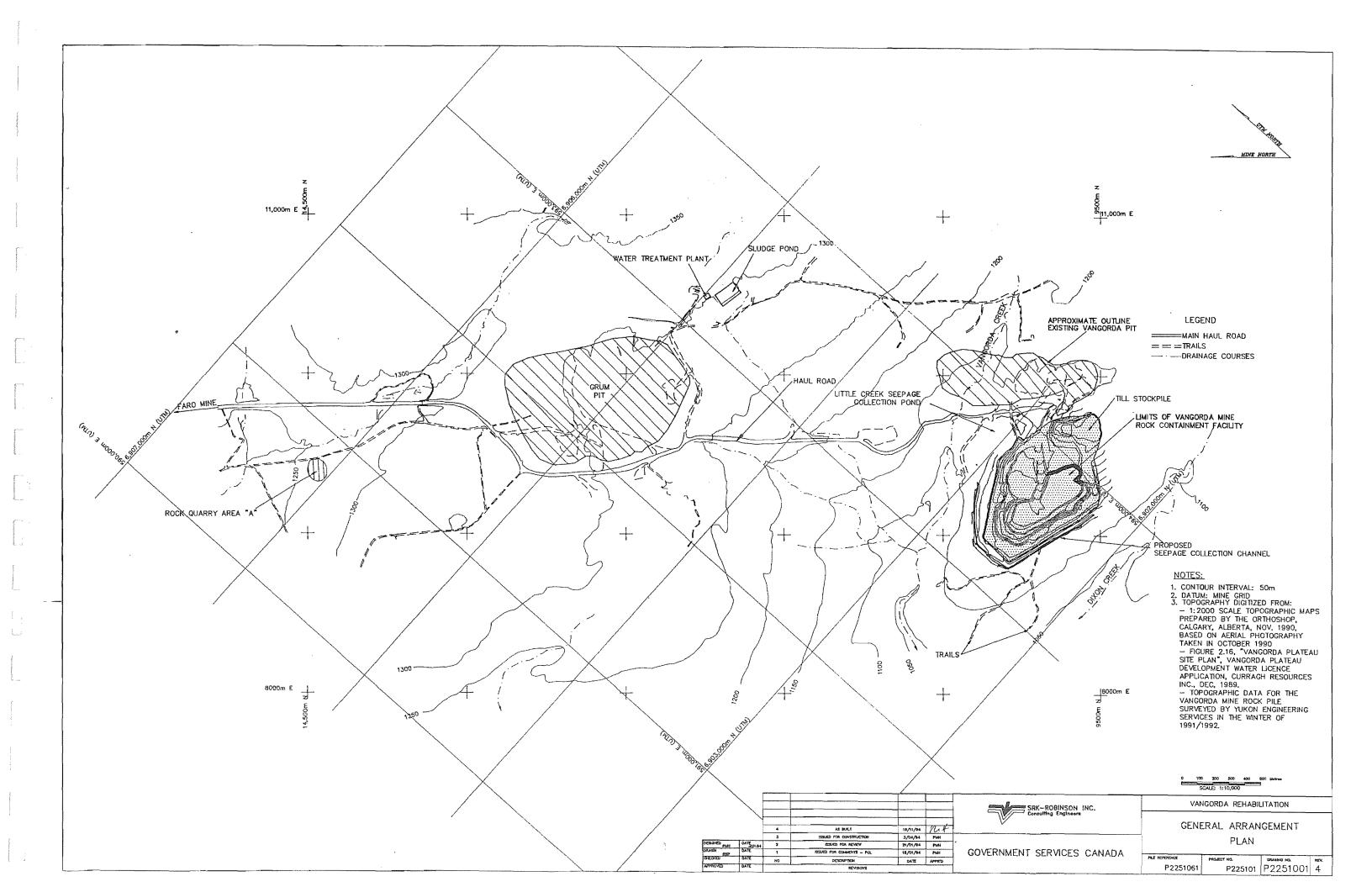
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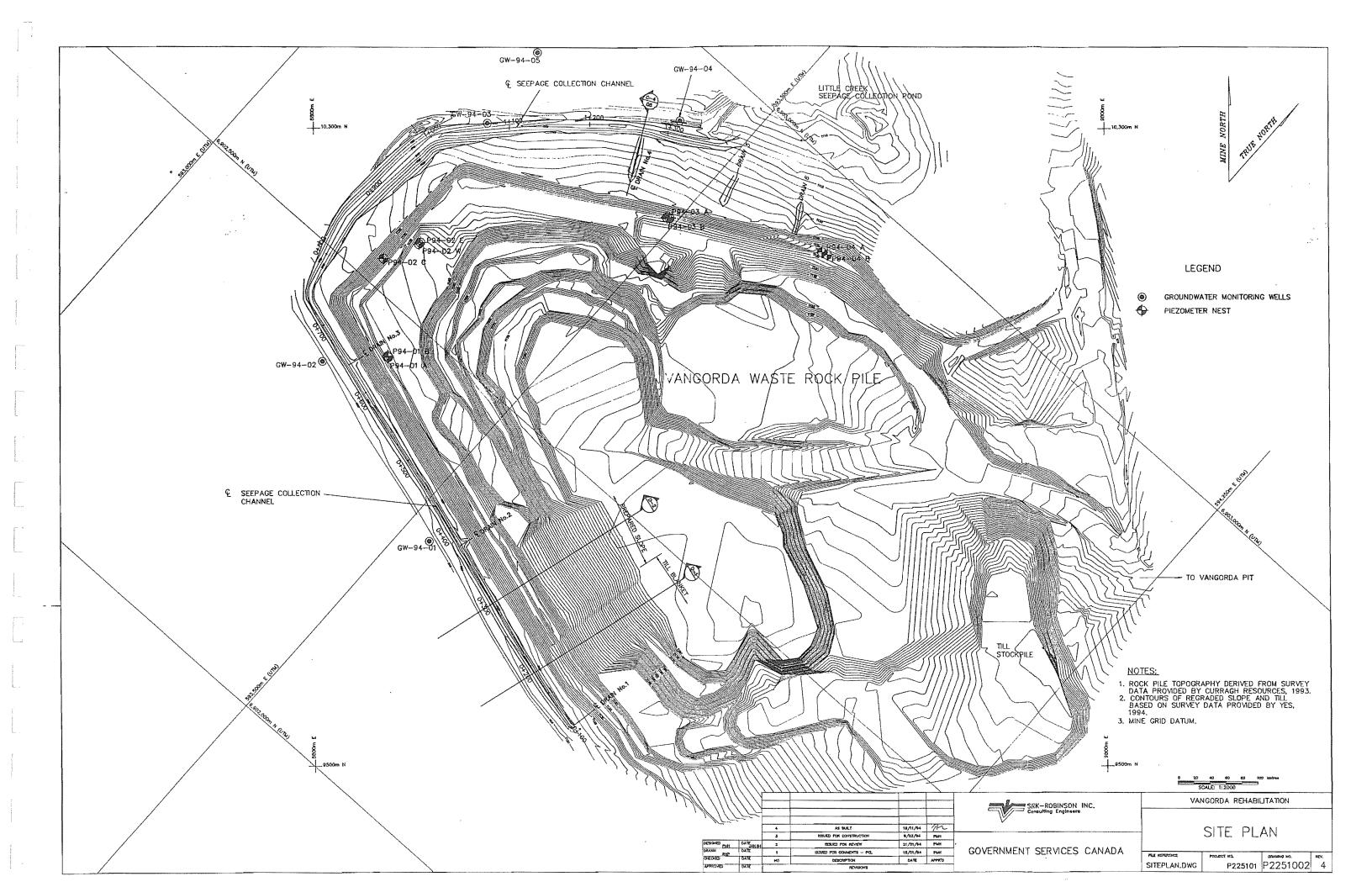
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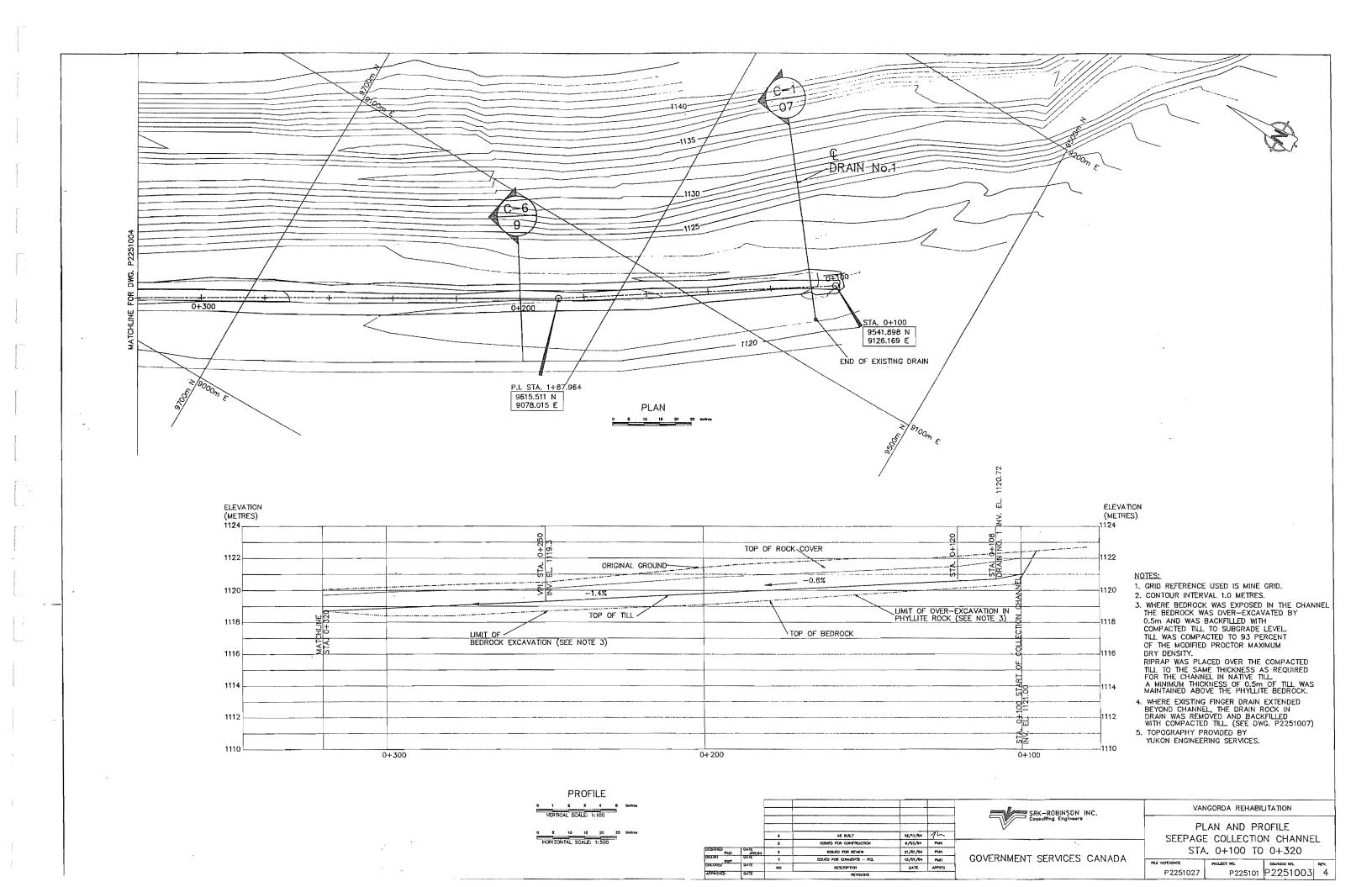
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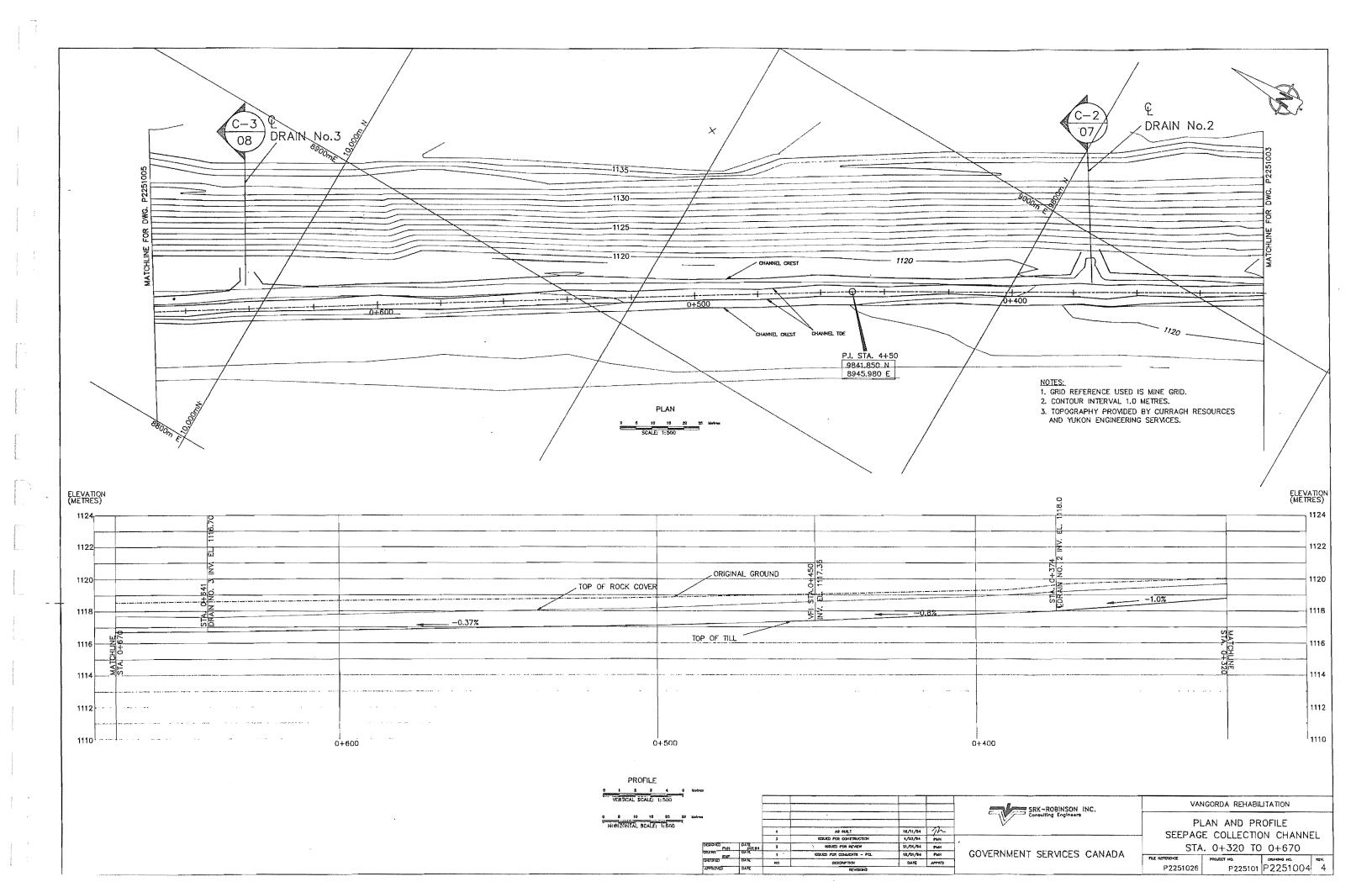
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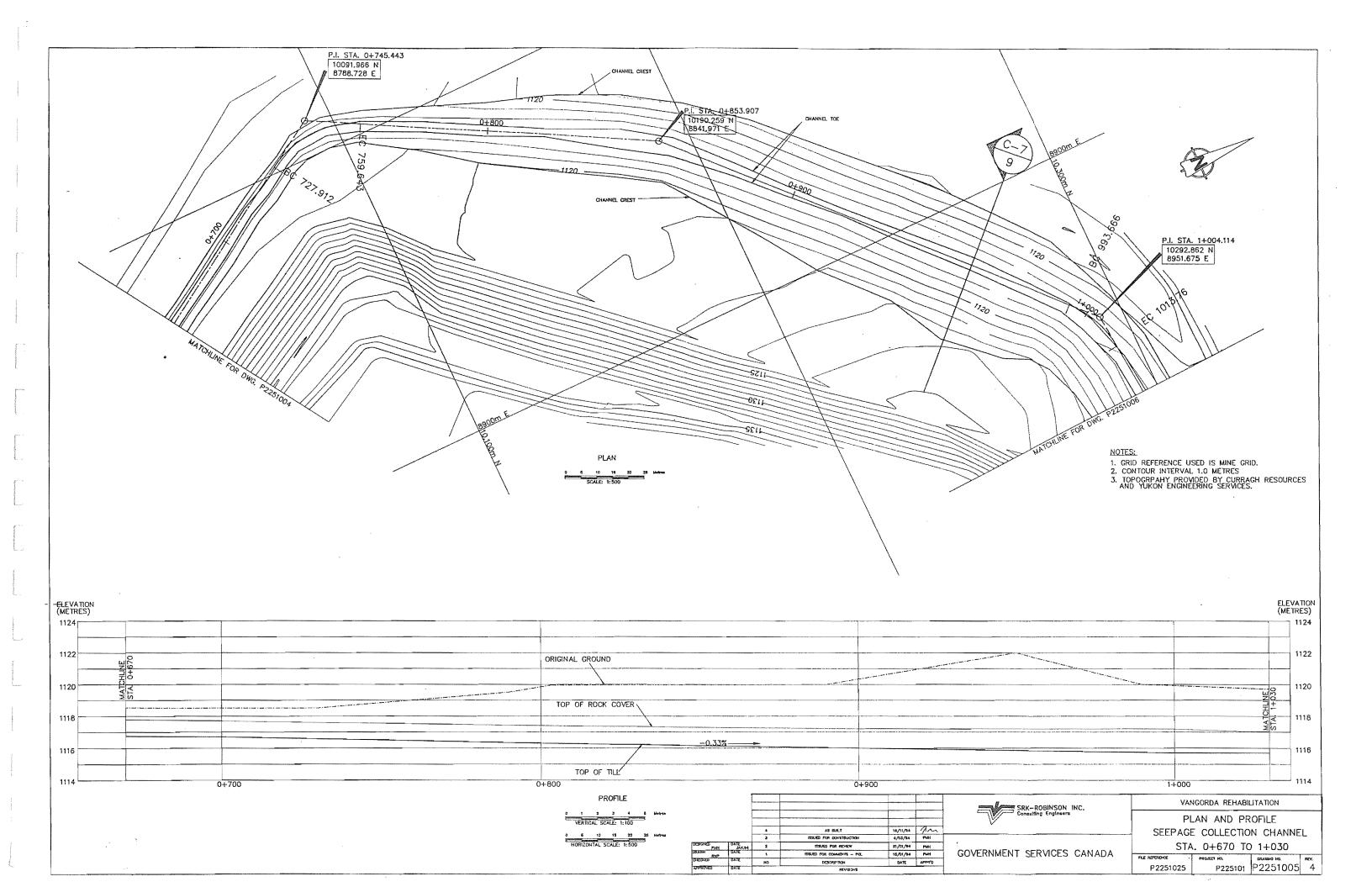
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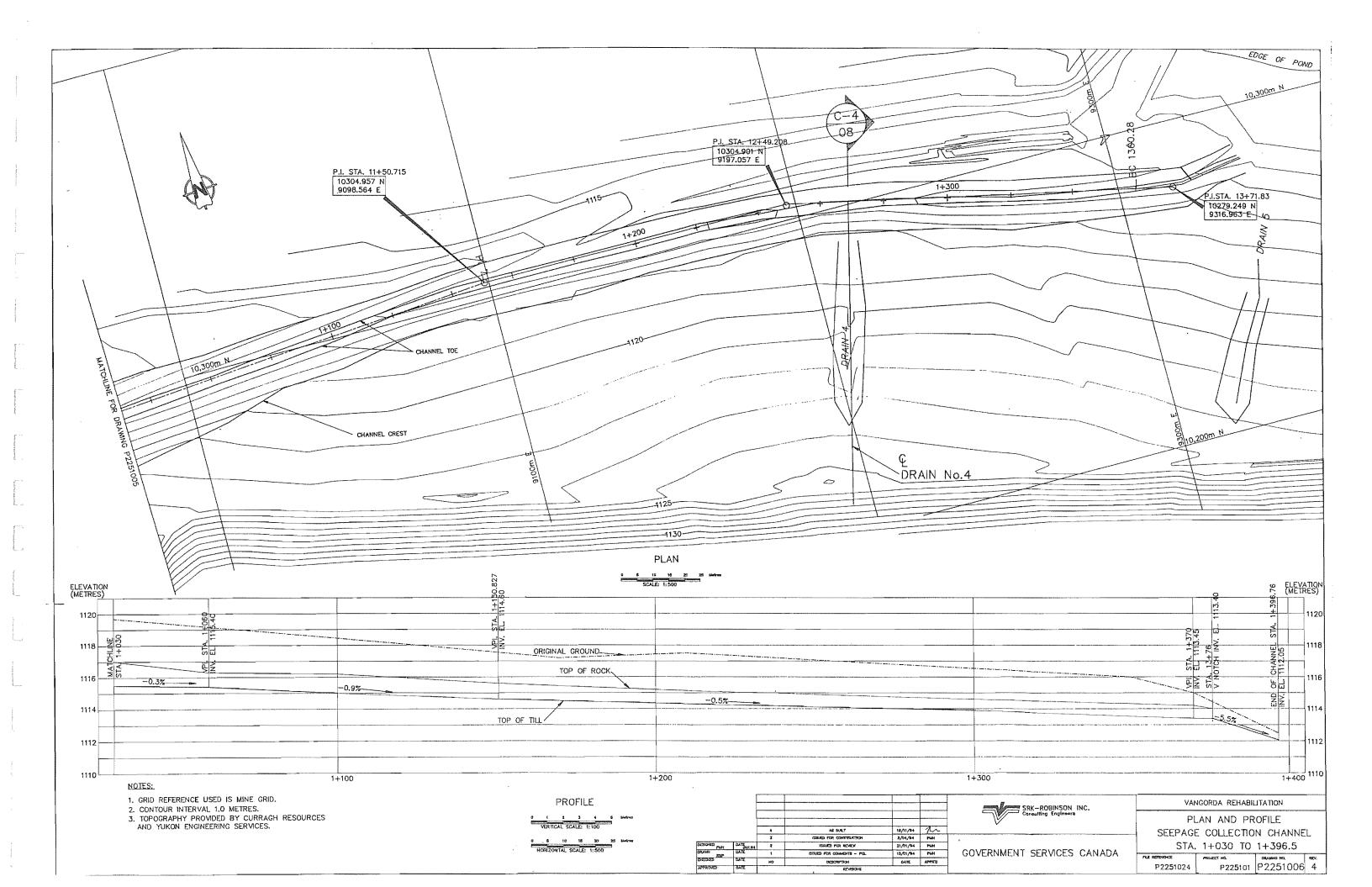


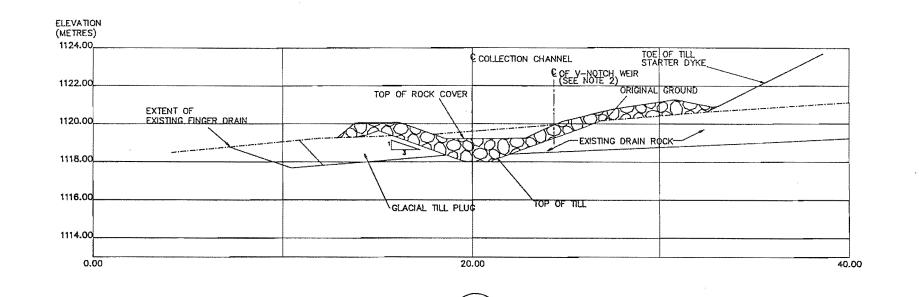




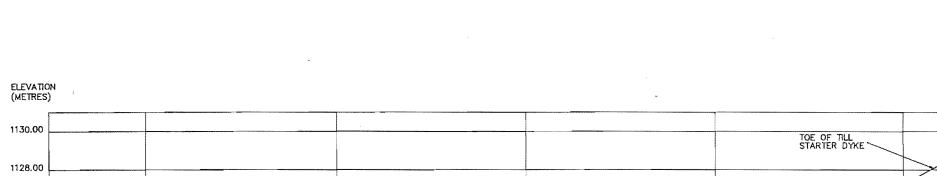


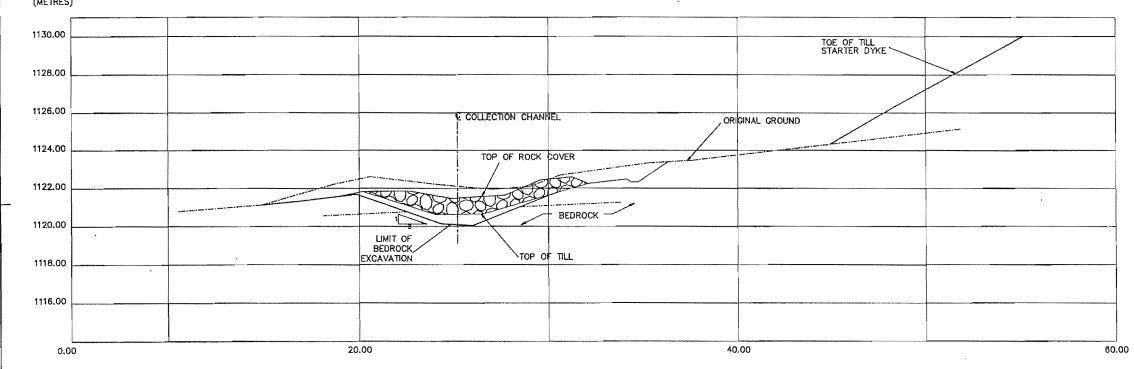






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NOTES:

- 1. DRAIN ROCK IN EXISTING FINGER DRAIN BELOW
 NEW CHANNEL WAS REMOVED AND REPLACED
 WITH GLACIAL TILL COMPACTED TO 93 PERCENT OF
 THE MODIFIED PROCTOR MAXIMUM DRY DENSITY,
 DRAIN ROCK REMOVAL AND REPLACEMENT WAS EXTENDED
 LEAST 5 METRES BELOW DOWNSTREAM CREST
 OF NEW CHANNEL.
- 2. V-NOTCH WEIR CONSISTS OF A 1.2 X 2.4 METRE STEEL PLATE EMBEDDED 900mm INTO GROUND, THE NOTCH HAS A 90° ANGLE AND IS 200mm DEEP.

STA. 0	+12	0	(<u>`</u>	1)
				03	
e	SCALE:	1.100	4	=	Motor
	SUME	11100			

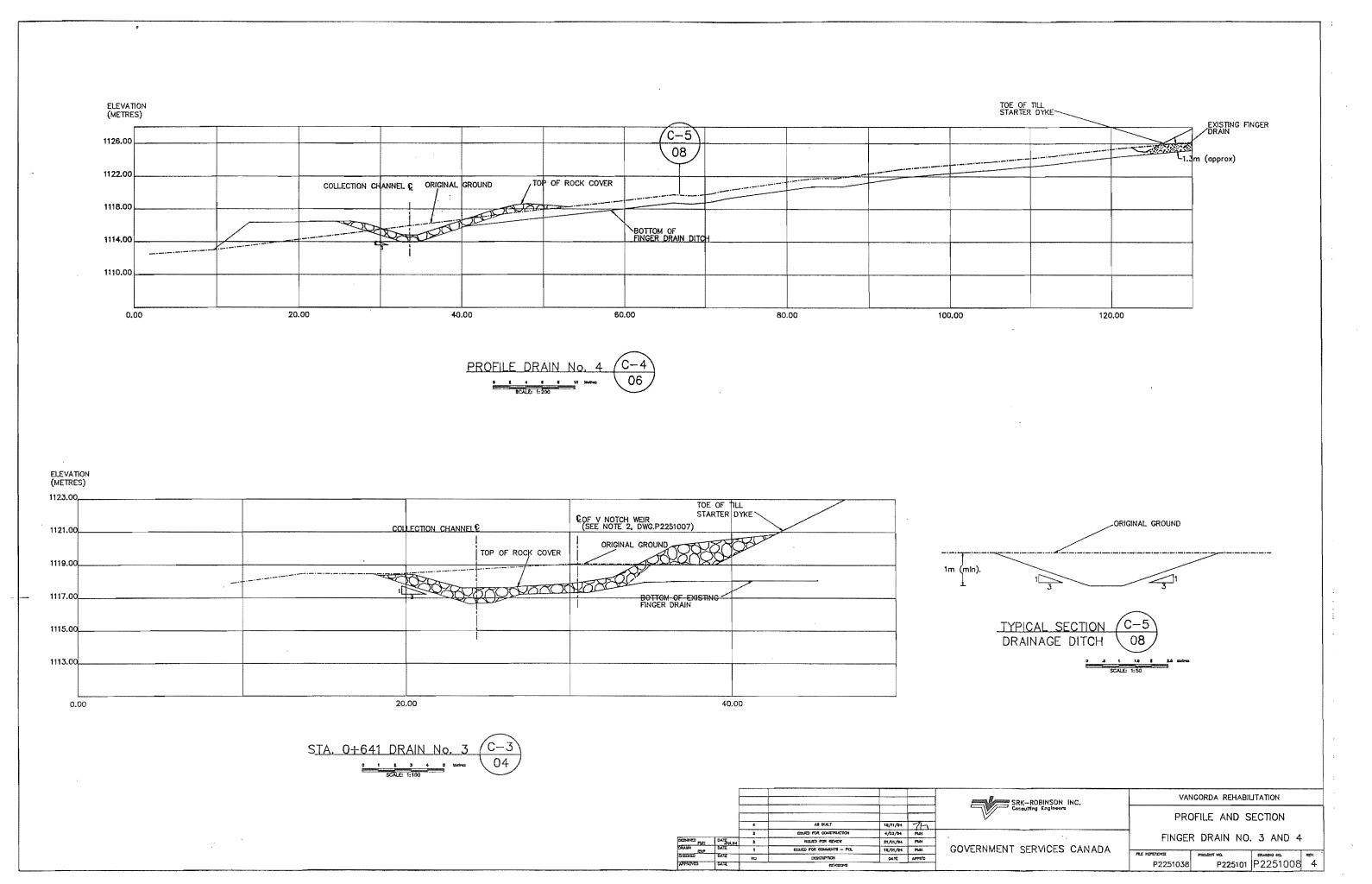
				1		
						1
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		4	AL BALT	19/11/04	11-	1
		,	CALED FOR CONSTRUCTION	4/02/64	PLOI	
DESIGNATE PART	OATE WEST	1	SECRED LOS MENSON	21/01/94	Pidi	1 '
GRAIN GTG	BATE	1	MOREO FOR COMMENTS - POL	15/01/04	PSPI	G(
G-40000	DAME.	160	CERCEPTION	BATE	MALE O	1
APPEND.	BANK		REVISORS .			1

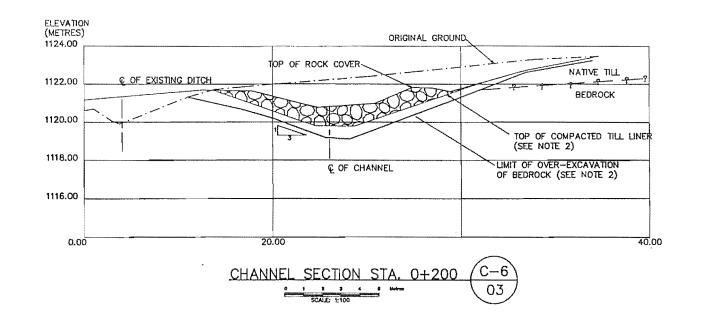
SRK-ROBINSON INC,

GOVERNMENT SERVICES CANADA

VAN	GORDA RE	HABILIT	ΑΠ	ON		
PRO	FILE AN	ID SE	СТ	ION		
FINGER	DRAIN	NOS.	1	AND	2	
PERMICE	PROJECT NO		CDAES	15 ISA	F 699	~

P2251037 P225101 P2251007 4

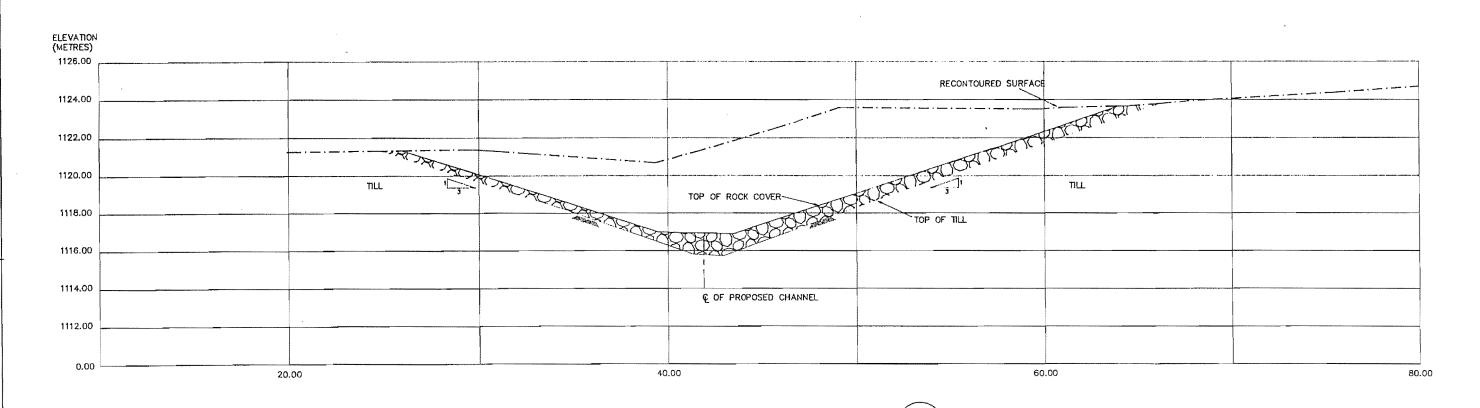




NOTES:

1. DEPTH OF TILL MAY VARY IN FIELD.

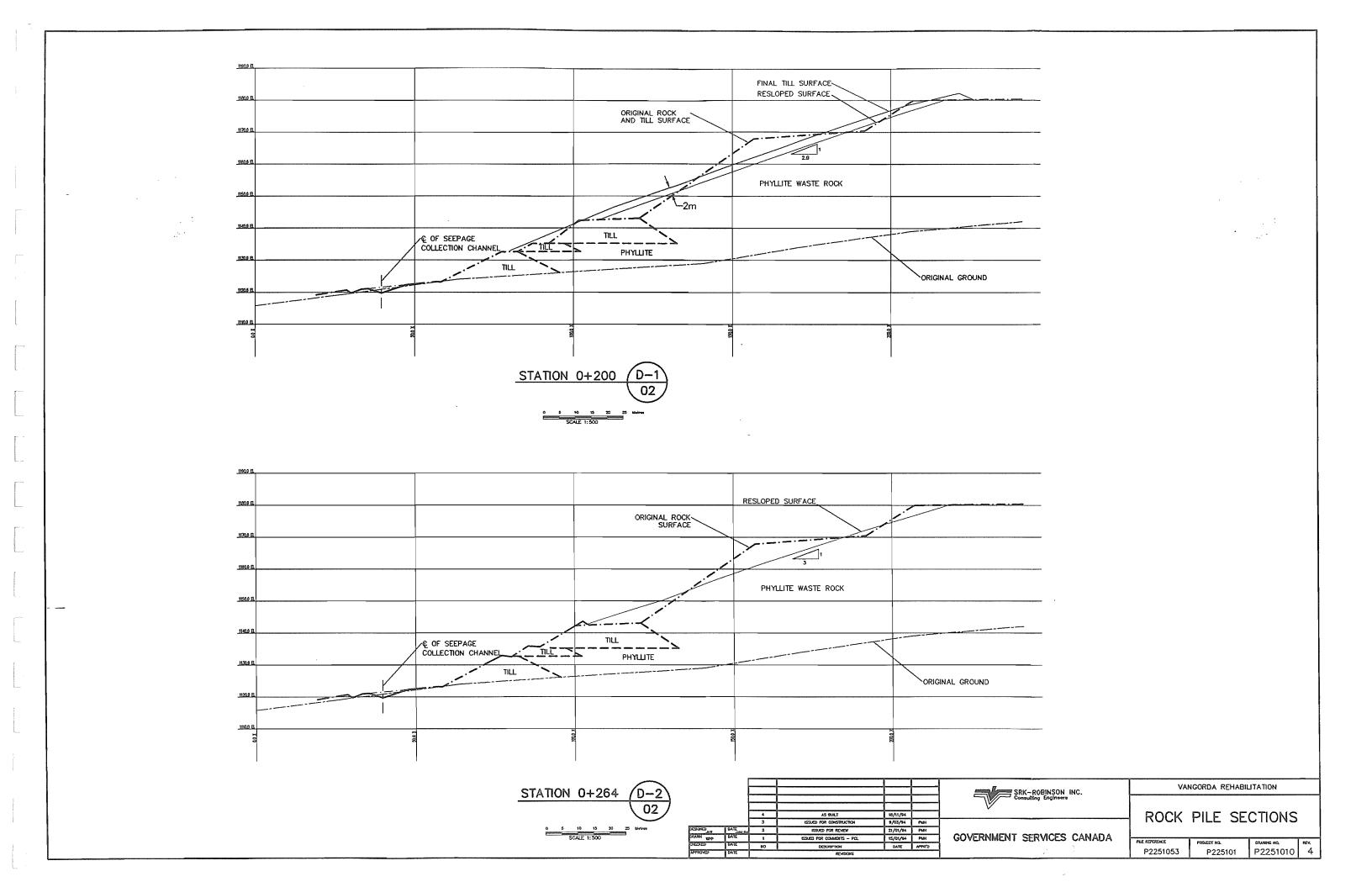
2. WHERE BEDROCK OR PERMEABLE SOILS WERE EXPOSED DURING CHANNEL EXCAVATION,
THE BEDROCK OR PERMEABLE SOILS WERE OVER-EXCAVATED TO A DEPTH OF AT LEAST 0.5m BELOW SUBGRADE AND BACKFILLED WITH GLACIAL TILL COMPACTED TO 93 PERCENT MODIFIED PROCTOR MAXIMUM DRY DENSITY.

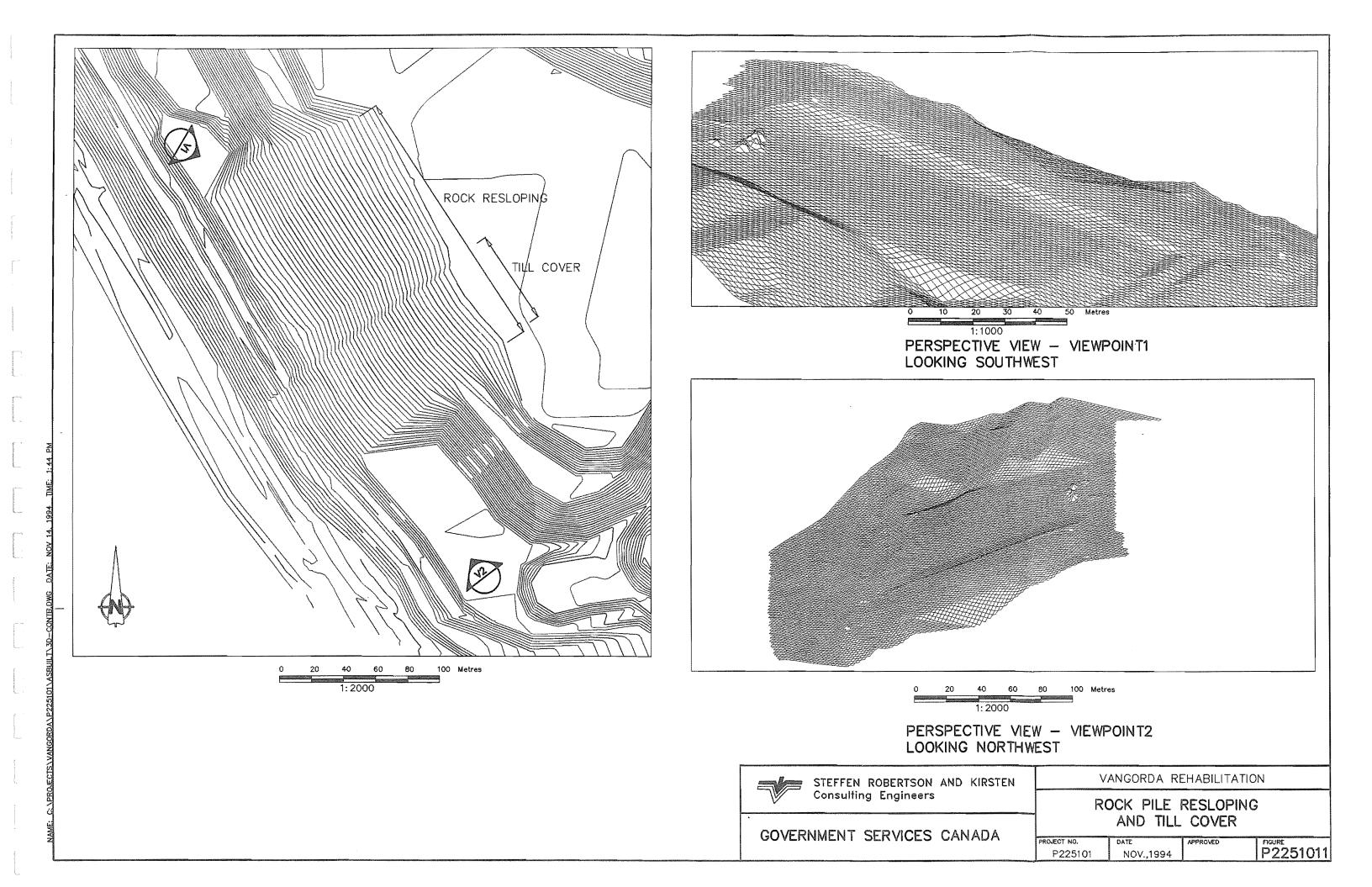


CHANNEL SECTION STA. 0+960

05







APPENDICES

APPENDIX A Borehole Logs from Piezometer and Groundwater Well Installation

APPENDIX B Results of Laboratory and Field Testing

APPENDIX C Photographs

APPENDIX A

Borehole Logs from Piezometer and Groundwater Well Installation

VANG	ORD	A WA	STE F	ROCK	CONTAINMENT FACILITY	CLIENT: PELLY CONSTR						BORE)-					
					LATION	DRILL: CME 750 - SOL						PROJE					
SAMP					ARO, YUKON B SAMPLE NO RECOVE	UTM ZONE: 8 N69097 RY STANDARD PEN.				IT SP.		elevat Rrel B				W COR	F
JAMI	Ī	1	- 200	John	1 SPAILE NO RECOTE	M BIMBARD I CH	<u>■</u> S	TANDA	RO PE	NETRA	TION III	Ţ	n Pl	RCENT	GRAVE	1 🛮	
E	SAMPLE TYPE	9	_	WELL INSTALLATION	90)IL	10	4	20	30	40	T		40 ERCEN			E
E		벌	SPT(N)	E)\							<u> </u>	20 PERC	40 ENT SII	60 TORI	80 Fines △	⊢
ОЕРТН (m)	d S	SAMPLE NO	ß	NSTA	DESCR	IPTION	PLASTIC	3	M.C	.	LIQUID	· L	20	40	60	80	
	S	,					10	2	20	30	40		GRUUN 20	40 40	060 60	PTION ∢ 80	1
0.0	Π				ORGANICS AND SILT, som	e moss and roots,									:		0.0
					SILT (TILL) — sandy, som	e aravel trace to	ᅫᆝᆘ										
 					some clay, stiff, l	ow plastic, fine			1								- 2.0
				3 7	grained sands, su	oangular particles											
1.0					brown				.			·	1			<u> </u>	<u></u>
					- seasonally frozen	(Nbn) to 1.2 m											- 4.0
-					- damp below 1.2				ļļ.						<u>.</u>	ļļ	<u> </u>
			}	i :													
- 2.0	1												<u>.]</u> j.			ļļ	6.0
																	<u> </u>
																	- 8.0
															1		
3.0							-									·	- 10.0
	17	1			 becomes softer, I colour changes to 												
}	IX		20		- some phyllite pied			اإا								ļļ	·
		1			(10%)	·											- 12.0
- 4.0								ļ	ļļ				<u>.ļļ</u>			ļļ	 -
																	- 14.0
																	14.0
																	1
																	- 16.0
- 5.0					— stiffer, harder dri	ling, drier			****				****			·	*****
								ļ									
}									ļļ.							ļļ	18.0
																	<u> </u>
- 6.0									ļļ.				<u>.</u> .			ļļ	
		7			- more phyllite rool	(20%), with some											- 20.0
L	IX		27		pieces of quartzite		9	<u></u>		a			<u>.ii</u>				<u> </u>
		4															- 22.0
- 7.0					- grinding rock										****		·
1																	- 24.0
- \\ \bar{\bar{\bar{\bar{\bar{\bar{\bar{									1				1			<u> </u>	_A
					— water at 7.6 m d 94/05/03	epth measured on		:									
8.0	_	D		B.E	<u> </u>	· · · · · · · · · · · · · · · · · · ·	LOGGED B	/· pr	<u>; ;</u>			100	MDI E	TION)EDTI	l: 12.5	- 26.0
	E,	ВA	Er	ıgır	neering Consul		REVIEWED		A					TE: 94			/ (11
94/05/27	45,21	DA.			Whitehorse, Yukon		Fig. No:								/		ge 1 of 2
are stated	(4)71	1 601															

—					CONTAINMENT FACILITY	CLIENT: PELLY CONSTI							BORE					4-01	
ļ					LLATION	DRILL: CME 750 - SC		************									1-11		
					ARO, YUKON B SAMPLE	UTM ZONE: 8 N6909 RY STANDARD PEN					PLIT SP.		elev RREL			- Landing	745 (NM/	m) CORE	
SAMP	Τ	T		GKA	B SAMPLE NO RECOVE	KI ZIANDAKO PER	<u>'· </u>	■ S	TANI	DARD	PENETRA	ATKN 📾	KKEL	8	PERC	ENT C	RAVEL	翠	
E	TYPE	일		2	97)]L	-	10)	20	30	40	+-	<u>20</u>	40 PERO		60 Sand €		(E)
) E	lu E	프	SPT(N)				ı						-	20	40 ROENT		60 Or Fin	80 IFS A	DEPTH (ft)
ОЕРТН (m)	SAMPLE	SAMPLE NO	ᅜ	WELL INSTALL ATION	DESCR	PIPTION	P	LASTI	IC	k	I.C.	LIQUI(' <u>L</u>	20	4()	60	80 110N �	
	S							10	0	20	30	40		20	4(60 60	80	
8.0																			_
																•			
_																			~ - 28.0
																			-
9.0																	·		- 30.0
					— drier, hard drilling	1													00,0
-	M		64						9		<u> </u>	 -				! .	+		
	\mathbb{N}	V			 grinding rock 														- 32.0
- 10.0					grillality rook	•		ļļ		ļ	.ļ . j	<u>ļļ</u> į.					<u>.ļļ</u> .		
																1			
																			- 34.0
									i	:									-
11.0					BEDROCK - phyllite		-				ļļ			····					36.0
					— very hard drilling, — fine, muddy cutti	nas with nieces of													-
-					phyllite	iga mai piooda oi	,	ļļ			ļļ						4		38.0
																			70.0
12.0										<u>.</u>	<u>.ii</u> ,	<u></u>				<u></u>			
123																			- 40.0
	X	1	95								•								
 	\mathbb{A}	4			END OF BOREHOLE		 	<u> </u>		···÷··							*		"
					NOTE:														- 42.0
- 13.0					- Hole sloughed to														
					be redrilled to 12.														
-					had broken off du pressure and hea			ļļ				ļļļ.					ļļ.		44.0
					bedrock	. n.v unining			1										-
- 14.0					MONITORING WELL INSTAL														400
17.0					- 0.15 m sand laye	r on bottom .2 m 50 mm PVC pipe													46.0
					- 8 bags sand to 5					•									-
-					- 0.5 bags bentoni	te to 4.3 m		<u> </u>		.				****	*		111	···•	- 48.0
					some water in homixed 3 bags gro									:		į			
15.0					for wells 94-01 of	nd 94-02					ļļ						.ļļ.		
					- top of PVC 0.58														- 50.0
-								ļļ			ļļ	ļļļ.			.ļļ		<u>.</u>		[
16,0																			- 52.0
	Ē	\overline{BA}	Er	gii	neering Consul	tants Ltd.	LOGGI											12.5 r	n
				Q T	Whitehorse, Yukon		REVIE Fig. N		DY:	<u>:</u>				UMP	LLIL:	94/	/ 04/3		2 of 2
94/05/27	12:42	PM			, , , , , , , , , , , , , , , , , , , ,		3, 1,				·····							90	

MONITO VANGO SAMPL			ELL	INST	AL				N LTD.									<u>-02</u>	
	RDA						DRILL: CME 750 - SC						PROJ						
SAMPL						RO, YUKON	UTM ZONE: 8 N6910						ELEV					<u> </u>	
1	<u>E T</u>	YPE		GR	AB	SAMPLE NO RECOVER	y 🔀 standard pe	٧. =	***		PLIT SP		RREL.				NW C		Υ
_	ر ليا			.					as STAI	ndard 20	PENETR 30	ALKON ESI 40		20	PERCEI 40	NIGH 60		1 30	
ОЕРТН (m)		SAMPLE NO	~	WELL		SO	II,								PERCE			2/1	1 E
피	믜片	띩	SPT(N)	国:	3							-	20 ▲ PER	CENT S	O TIL		30 S.∆	DEPTH	
<u>Б</u>	SAMPLE	₹	ŝ	-		DESCR	IPTION	PI	LASTIC		M.C.	LIQUID	,	20	40	6	} ;	30	벌
	क्ष	S							10	20	30	40	1	> CROU 20	IND IC 40	e des 6		ON � 30	-
0.0	\dashv			1.1	ī	ORGANICS AND SILT, some	moss and roots,		10	1	Ť		11	1	Π	TÌ	<u>, </u>	1	0.0
					[4	some white ash													F .
				ş-		SILT (TILL) — sandy, some	gravel, trace to											<u>}</u>	- 2.0
				:	1	some clay, stiff, lo	w plastic, fine												
1.0				[:]		grained sands, sub	angular particles					·			 			 	·[
				5	14	. brown — seasonally frozen	(Nhn) to 1.2 m												- 4.0
				-		- damp below 1.2 m				ļļ					ļļ			ļļ	+
						•													- 6.0
2.0				[•]		 grinding rock 			<u>.</u>	ļ <u>ļ</u>		.ļļļ.			ļļ			ļļ	. 0.0
				13	1														-
.				1	1.	•				ļļ		<u></u>			ļļ		ļ	ļļ	8.0
													.	:			*		
3.0					:					<u>.</u>		įįį			ļļ			įį	400
3.0	abla		85		1														- 10.0
	Ň		25	13					(9)										-
		1					(nnm) tu												- 12.0
				:	:	- more phyllite rock													
4.0				1	-4	- higher moisture co										***************************************	•••	1	ſ
						— colaur changes to	ddiket Otdali												- 14.0
		- 1							ļ <u>ļ</u>	.					<u> </u>			 	-
																			- 16.0
5.0								····	ļļ	ļļ		<u> </u>	‡		ļļ			 	10.0
																			<u> </u>
.								ļ	ļļ	ļļ		.ļļļ.			ļķ			ļķ	- 18.0
-		- 1																	
6.0										<u>.</u>		.ļļ.,ļ.,			ļļ			ļļ	
3.3	\square																		20.0
	ĂΙ		24						6										-
																			- 22.0
7.0		1																	
7.0																			<u> </u>
						— safter, higher clay	content low to												- 24.0
						medium plastic	50												-
						- colour changes to	darker brown,												- 26.0
- 8.0						almost black				} <u>}</u>		·•			ļļ	··i····à		†	20.0
														į					r
									<u> </u>			1			<u> </u>			 	28.0
		-												:					L
9.0									ļļ	ļļ					ļļ		ļ	∤∤.	
	\bigvee		D.C.			SILT AND CLAY - some so													- 30.0
	M		20			firm, low to med p		ļ	•	\$		ļļļ.			ļļ			ļļ	. -
						grained sands, sub	angular particles												- 32.0
10.0						some quartzite and				<u> </u>		<u> </u>						<u> </u>	
	ER	A	Er	ιgi	in	eering Consult	ants Ltd.	LOGGE			***************************************							5.5 m	<u> </u>
			4	-01		Whitehorse, Yukon		REVIEW		<u>Y:</u>			C	OMPL	LIE:	94/0			1 -60
4/06/01 1	0:57AH					umremorse, lukoll		Fig. N	U									ruge	1 of 2

					CONTAINMENT FACILITY	CLIENT: PELLY CONSTRU							BORE							
MONITORING WELL INSTALLATION DRILL: CME 750 - SOL													PROJECT NO: 0201-11365							
					ARO, YUKON	UTM ZONE: 8 N691000	28.16						ELEV			1116		<u>`</u>		
SAMPI	LE T	YPE		GRA	SAMPLE NO RECOVE	ry 🔀 standard pen.				SPLIT		لسلبلسا	RREL				_62;	W C	ORE	
	ليا	_						■ ST/ 10		O PEN	IETRAT 30	FION ₪ 40		20		CENT 40	GRAVI 60	ELE 8	0	_
ОЕРТН (m)	SAMPLE TYPE	8	<u></u>	WELL NSTALL ATTON	S)]L	PLASTIC M.C. LIQUID					● PERCENT SAND ●					1 ≇			
Ξ	щ	SAMPLE NO	SPT(N)							20 40 60 80 A PERCENT SILT OR FINES A				DEPTH (ft)						
	릊				DESCE	IPTION				LIQUIC)	20 40 60 80				日日				
	S	S		2	DIDOI	MIL 11011		-					•	◆ GROUND ICE DESCRIPTION ◆						
10.0				स्य ह	damp to moist, d	a-d- a-a-i		10	- 2	0 -	30 : :	40	+	20	:	40	60	. 8	0 :	<u> </u>
10.0					damp to moist, d	urk grey														~
		Ì						·								.ij				- 34.0
																				-
44.0																				36.0
11.0																	1			. 30.1
																				†
												••••					۔۔۔ؤ۔۔۔۔			- 38.0
																	:			
12.0																-			···	ſ
	\forall		,																	- 40.0
	IXI		33					9			3	ļļ.		ļ		ļļ				
					 higher clay conte 															
13.0					at 12.5 m, less g	ravel and very														- 42.0
13.0					fine silts															}
																				- 44.0
														••••				†···	•••••	1
Ā			*		1 1470	()		i												- 3
14.0					- water at 13.8 m	depth measured on										ļļ				46.0
					94/05/03												•		-	
																				.[
		Ì												-			į			- 48.0
4E A																	į			-
15.0				:日:															Ĭ	
	\square		47																	50.0
	M		47		— damp to moist, s	ame phyllite								····		1	·	·	****	+
					_ no water at this	depth	/													- 52.0
16.0					END OF BOREHOLE									<u>į</u>		-			·	. 021
		1			NOTE:															†
					 some yellowish b 						.JĮ					<u> </u>	<u>.</u>	. .		54.0
						between 9.1-12.2 m														
17.0					- water was notice			į												
17.U					about 10.7 m bel												1			- 56,0
					MONITORING WELL INSTAL			;												-
					- 0.15 m sand lay						1			<u>!</u>		11	·			-
						5.2 m 50 mm PVC pipe									-			1		- 58.0
18.0		ł			 - 10 bags sand to - 0.5 bags bentoni 	to the bolow grade								∤	}	ļļ.		·		ŀ
					- used grout mixed															60.0
					- top of PVC 0.53		[]	<u>ļ</u>			.ļļ.				ļ	ļļ.			<u>.</u>	
					10p 01 1 10 0.00	in aporo ground														
19.0																				- 62.0
1310								i												L
															į					
								····			1					-	<u>.</u>	-		64.0
10.5																				L
20.0	ᆜ	\perp		<u> </u>			DOOC	T. (7)	, no		<u> </u>	<u> </u>	15	01/5	1	111	<u>;</u>	<u>;</u>		
									OGGED BY: BCF EVIEWED BY:					COMPLETION DEPTH: 15.5 m COMPLETE: 94/04/30						
				J	Whitehorse, Yukon	Li.	ig. No		315				C	UMP	LLIL	: 94	/04/)~	2 of 2

				CONTAINMENT FACILITY	CLIENT: PELLY CONSTRU												4-0	3
	ORING V				DRILL: CME 750 - HOLL UTM ZONE: 8 N691030							PRO.				731 ·		
	LE TYPE			ARO, YUKON B SAMPLE NO RECOVE		6.67 F		mm S		. SD	ПС	RREL					CORE	
SAME	LE HIFE		UNA:	3 SAMPLE NO RECOVE	KI STANDARD FEN.	T						INNLL				CRAVEL		1
~			Z	a.	NTT	-	10	20		30	40		20	4	40	60 SAND	80	┵
DEРТН (m)	SAMPLE TYPE SAMPLE NO	SPT(N)	WELL INSTALL ATTON	50)IL								20		40 40	60 60	80	J T T T T T T T T T T T T T T T T T T T
늗	밀달	15	WELL	DECCE	IPTION	PI	ASTIC		M.C.		LIQUII	3				OR FI		占
E	SES	"	S	DESCI	IF HON	' '			-0-				<u>20</u> ⇔ (3R)		40 ICF D	60 FSCRIF	- 80 ◆ MOTF	-
~ ~						<u> </u>	10	20)	30	40		20		40 .	60	80	100
0.0			- :	SILT (TILL) — sandy, som	e clay, some													0.0
				gravel, very stiff,														+
			[<u>i</u>] -	plastic, fine graine subangular particl				- -			 -				· -			- 2.0
				- frozen to approx.			•											- 2.0
			[-] [:	ilozon to approx.	7.0 III, NOII 1X		İ											-
1.0			 1 :															"
			1															- 4.0
				;				ļļ.							ļļ.			
]														
] [-	•														- 6.0
2.0			 [:					 							·			
			1	- grinding rock, ver	y hard drilling													
									:									- 8.0
							1							1				***
				1					***									-
3.0								ļļ.					į .,		ļļ.			10.
			: -	 higher gravel con 	tent, some													··· - 10,6
	目	45		quartzite rock	ain and construction		•				闡							-
	目			 some medium graded sand depo 									<u>i</u>		-			
					sured at -0.2 deg. C													- 12.0
			: -	- more rock	Jaroa at a.z. aug. s													L
4.0				- becomes softer,	nigher moisture				••••							1		"
	11		3 :	content when that														- 14.0
			j.	— colour changes to	brownish grey			ļļ.							ļļ.			
				- very stiff till, less	rock													
				,														- 16.0
5.0		l			•			ļ					<u>.</u>		·			
																		+
				1														18.1
																Ť		ا.ما ۲۰۰۰
																		-
6.0							ļ	ļļ.							ļļ.			
				– temperature mea	sured at -0.2 deg. C		į											- 20.0
		70			· ···· - j · -		0		į									L
								1					····.		<u> </u>			
									:									22.
7.0																		
7.0												***				******		```
																		- 24.0
								ļļ.							. .			
									-									F
8.0																		00
0.0	11.12 V	_ הד		1	Lata III	GGF	D BY:	HCF	<u>:</u>	<u>: :</u>	<u> </u>	<u> :</u> c	OME	I FTI	<u>: :</u> 0N D	FPTH•	11.9	- 26.0 m
	FDA	ĽΓ	ıgır	neering Consul			VED B									/04/:		• • • • • • • • • • • • • • • • • • • •
				Whitehorse, Yukon		g. No												1 of :

VANG	ORD	A WA	STE I	ROCK	CONTAINMEN	IT FACILITY	CLIENT: PELLY CONS	TRUCTIO	N L	TD.										4-03	
					LLATION	., ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	DRILL: CME 750 - H												1-11		
					ARO, YUKON		UTM ZONE: 8 N691						<u>r-</u>						731 (
SAME	LE	TYPE		GRA	B SAMPLE	NO RECOVER	y Standard Pe	N. E	-			PLIT S			RREL				NW		7
	ابرا			_	-				■ 3 1(20 20	20 30	ration 4			20	4	0	GRAVEL 60	80	
DEРТН (m)	SAMPLE TYP	SAMPLE NO	2	WELL		S0	IL									20	PER 4		SAND @) 80	1 3
E	빚	급	PI	E S]				r ACT	0				LIÇVIE		A PE			OR FIN	ES A	DEPTH
	AM	₹	S	N N		DESCRI	PHON.		LASTI		R	l.C.		⊔Q01L 		20 ക രാവ	HNA.		60 Escript	80 nou a	핌
	L',			<u> </u>					11)	20	30	4	0 .		20		0	60	80	
8.0																					L
											į										
-											.										- 28.0
- 9.0								ļ	<u>, </u>	. į.		<u></u> j.									.[
""	H																				- 30.0
	ΙX		41							•											
†	\triangle	¥							·····												1
																					- 320
- 10.0								ļ	ļ			<u></u>									
																					- 34.0
Ā							andb		1	••••				1							Ā
ļ						ier at 10.6 m a '05/03	epth measured on				***										
- 11.0					i	007 00			····			·					<u>-</u>				36.0
]	***************	***************************************														L
							thick sand seam				۵										
						nd materials not nding rock, not															- 38.0
						750	armanie with														
120					END OF BO				ļļ								-				1
					NOTE:																40.0
						water level at 1]	<u>.</u>			<u> </u>				,					
						m water in hol G WELL INSTALLA	e at 1240 ms ATION — 1830 hrs														
						5 sand layer on					i										420
- 13.0					1.5	m screen+12.2	2 m 50 mm PVC pipe	,			•••										1
							5.3 m below grade														
-						oag bentonite to	4.8 m it + 25 gal. water		ļļ			ļļ.									- 44.0
						tall protective co															_
1440						of PVC 0.63 m															
- 14.0							•											*****			46.0
																					-
-									ļļ											 	
											į										- 48.0
15.0																					-
1520																					1
																					- 50.0
-									ļļ			1									+
16.0		<u> </u>	L	<u></u>	<u> </u>			11.5.5.5											<u> </u>	<u> </u>	- 52.0
	\mathbf{E}	BA	Er	ıgiı	neering	Consult	ants Ltd.	LOGGI											EPTH: /04/2	11,9 m	<u> </u>
				_	_	rse, Yukon		Fig. N		ונו	1	····			-	OMPL	LIL	34/	V4/ Z		2 of 2
94/06/01	10:594	W			,			<u> </u>													

					CONTAINMENT FACILITY	CLIENT: PELLY CONST											-04	
					LATION BO YUKON	DRILL: CME 750 - H							ROJEC					
SAMP					RO, YUKON SAMPLE NO RECOVERY	UTM ZONE: 8 N6910 STANDARD PE			9201. mm (SP.		LEVATI REL BAI) co		
SAMI	T			Ī		Markovio		■ STA	ANDARO	PEN	ETRAT	ION III		■ PER	CENT G	WEL I	1	
(E)	SAMPLE TYPE	9	_	WELL INSTALLATION	90	ſΤ	-	10	20		30	40	2	O PE	RCENT S		80	(£)
) H	II.	Ш	SPT(N)	금톡	S0	lL .							2	0 -	40	60	80) н
ОЕРТН (m)	MP	SAMPLE NO	Sp	STA	DESCRI	PTION	P	LASTIC		M.C.		LIQUID			IT SILT 40		:S ▲ 80	DEPTH
	SS	Ŝ		Z	171100141	1 11011		10	20		30	40	♦ G		ICE DE		ON 🔷 80	
0.0	+				SILT (TILL) — gravelly, sand	ly, trace of		10	1 1			10	1			1 1	1 1	0.0
				<u> :</u> ::	clay, roadway fill ma					Ì								-
-																		- 2.0
- 1.0																		- 4.0
				1 1														T 4.0
Ī																		
- 2.0								ļļ	<u>.</u> įį.				ļļ		ļļ	ļļ		- 6.0
1					SILT (TILL) — sandy, grave	ly, some clay,	_			i								-
_					frozen (Nbn), low plo	stic, fine		ļļ.,					ļ <u>.</u>		ļļ	<u>ļļ.</u> .		- 8.0
				11 -	grained sands, subar	igular particles,			•									- 1
3.0				1	brown — temperature measur	ad at0.2 dag C		ļ !							ļļ	ļļ		- 10.0
				8.	- temperature measur	ed dt -0.2 deg. C												
+								ļ <u>.</u>							ļļ	ļļ		
																		- 12.0
- 4.0							****	ii			- <u> </u>					ļļ		
	Ì																	- 14.0
-					- hole sloughed to 4.5	m - switched to		!	i							 		- [
5.0					hollow stem augers													- 16.0
- 5.0				1 :	- less gravel content,	higher moisture												
					content													- 18.0
																		- 10.0
- 6.0																		
"	E																	- 20.0
-															ļļ	ļļ	<u>.</u>	-
																		- 22.0
7.0							***	ļ <u>ļ</u>							<u> </u>	ļļ		-
					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1													- 24.0
-					— harder drilling			ļ <u>i</u>								ļļ		
																		00.0
- 8.0								<u>.</u>				!			ļļ			- 26.0
ľ							****									i i		- 28.0
- 9.0																		-
3.0					 higher silt and clay 	content	. ***	Ĭ			T							- 30.0
L					mgnac and and oldy			۵										_
	F																	- 32.0
10.0	L				 grinding rock 		1. 5 = =						1		<u> </u>			02.0
	$\mathbf{E}_{\mathbf{I}}$	BA	En	gin	eering Consulta	ants Ltd.	LOGGE								ON DE : 94/		14.1 m	
					Whitehorse, Yukon		Fig. N		21.				- COM	1 441	<u>. 54/</u>	134/ZC	Page 1	of 2
94/06/01	11:00A	J.											l				90 !	

MONIFORN WELL NISTALATION						CONTAINMENT F	ACILITY	CLIENT: PELLY CONST										34-(
SAMPLE TYPE																				
SOIL DESCRIPTION							NO RECOVER	I											E	
- 11.0 -	(m)	TYPE		- Salvon				IL		STA 10 ASTIC	NDARD 20	PENETR 30 u.c.	ATION ME 40	' <u> </u>	20 20 ▲ PER 20	40 Percei 40 Cent Si 40	60 IT SANI 60 LT OR I 60	80 80 FINES ▲ 80		DEPTH (ft)
- 11.0 grinding rock 38.0 - 38.0						61	- L (O 15)			10	20	30	40	+	20	40	60	80		-
- finish drilling today at 1900 hrs - continue on 94/04/24 at 0800 hrs - very dusty dry till, very hard - very hard drilling - broke down from 1030 – 1630 hrs - water at 13.9 m depth measured on 94/05/03 - very hard till with some phyllite END OF BOREHOLE MONITORING WELL INSTALLATION - 0.15 m sand layer on bottom - 1.5 m sacreen+14 m, 50 mm PVC pipe - 9.5 bags sand to 9.0 m below grade - 1 bog bentonite to 8.3 m - mixed 4 bags grout + 45 gal. water - installed protective casing + endcap - top of PVC 0.69 m above ground - 18.0 - 18.0 - 19.0 - 62.0 - 64.0	- - 11.0					·	, ,								***************************************					-
- finish drilling today at 1900 hrs - continue on 94/04/24 at 0800 hrs - very dusty dry till, very hard - very hard drilling - broke down from 1030 – 1630 hrs - water at 13.9 m depth measured on 94/05/03 - very hard till with some phyllite END OF BOREHOE MONTORING WELL INSTALLATION - 0.15 m sand layer on bottom - 1.5 m screen+14 m, 50 mm PVC pipe - 9.5 bags sand to 9.0 m below grade - 1 bag bentonite to 8.3 m - mixed 4 bags grout + 45 gal, water - installed protective casing + endcap - top of PVC 0.69 m above ground - 18.0 - 18.0 - 19.0 - 19.0 - 62.0	40.0					— grinaing	rock													- 38.0 -
- 13.0 - very hard drilling - broke down from 1030 - 1630 hrs - 44.0 - very hard drilling - broke down from 1030 - 1630 hrs - 44.0 - 44	- 12.0 -									•					*********					- 40,0 -
- 14.0 - 14.0 - 15.0 - 15.0 - 16.0 - 18.0 - 19.0 -	- 13.0					– very du – very ha	sty dry till, v rd drilling	very hard												· 42.0 -
94/05/03 - very hard till with some phyllite END OF BOREHOLE MONTORING WELL INSTALLATION - 0.15 m sand layer on bottom - 1.5 m screen+14 m, 50 mm PVC pipe - 9.5 bags sand to 9.0 m below grade - 1 bag bentonite to 8.3 m - mixed 4 bags grout + 45 gal. water - installed protective casing + endcap - top of PVC 0.69 m above ground - 18.0 - 18.0 - 19.0 - 20.0 - 48.0 - 48.0 - 48.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 50.0 - 60.0 - 60.0																				-
END OF BOREHOLE MONITORING WELL INSTALLATION - 0.15 m sand layer on bottom - 1.5 m screen+14 m, 50 mm PVC pipe - 9.5 bags sand to 9.0 m below grade - 1 bog bentonite to 8.3 m - mixed 4 bags grout + 45 gal. water - installed protective casing + endcap - top of PVC 0.69 m above ground - 17.0 - 18.0 - 18.0 - 19.0 - 20.0	- 14.oF	X		70		94/05/0	03	,)					*****					- 46.0 -
- 1.5 m screen+14 m, 50 mm PVC pipe - 9.5 bags sond to 9.0 m below grade - 1 bag bentonite to 8.3 m - mixed 4 bags grout + 45 gal. water - installed protective casing + endcap - top of PVC 0.69 m above ground - 17.0 - 18.0 - 19.0 - 20.0	- 15.0					END OF BORE! MONITORING W	HOLE 'ELL INSTALL	ATION												· 48.0 -
- 16.0 - mixed 4 bags grout + 45 gal. water						- 1.5 m s - 9.5 bag	screen+14 n is sand to 9	1, 50 mm PVC pipe .0 m below grade							••••					· 50.0 ·
- 17.0 - 56.0 - 58.0 - 60.0 - 60.0 - 62.0 - 64.0 - 6	- 16.0					— mixed 4 — installed	1 bags grout 1 protective	. + 45 gal. water casing + endcap							***************************************					- 52.0 -
- 18.0 - 58.0 - 58.0 - 60.0 - 62.0 - 64.0 - 64.0	-					- top or r	1 40 0:03 111	above ground												- 54.0
- 18.0 - 19.0 - 20.0	- 1/.0 -																			· 56.0
- 19.0 - 20.0	- 18.0								**************************************											· 58.0 ·
20.0	-																* * * * * * * * * * * * * * * * * * *			· 60.00 ·
20.0	- 19.0														,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					· 62.0 ·
FRA Engineering Consultants Itd LOGGED BY: BCF COMPLETION DEPTH: 14.1 m	20.0										ļ				***************************************					· 64.0 ·
EDA Engineering Consultants Ltd. Reviewed BY: COMPLETE: 94/04/25		$\overline{\mathrm{EB}}$	A	En	gir	neering (Consult	ants Ltd.											m	
Whitehorse, Yukon REVIEWED BY: COMPLETE: 94/04/25 Fig. No: Page 2 of 2					J	_					1.			U	UMPLI	1111 9	4/04/		ge 2	of 2

				CONTAINMENT FACILITY LLATION	DRILL: CME 750 - HOL			UGERS)LE NO: T NO:				_
				ARO, YUKON	UTM ZONE: 8 N691039							ON: 11				_
	LE TYPE			B SAMPLE NO RECOV				ım SPU	T SP		EL BAF			NW (<u> </u>	
JAMP	LL 1171	- 9	S OI W	I SAME VIOLEDAM	LII DIAMOTEIL	EDITIONNI		DARD PE		lander) and		PERC	ENT CR	AVEL 10		_
~	<u> 원</u> 0		Z	3	O I I		10	20		40	20	0 40		}	80	_
n.		3		S	OIL						21				80	
ОЕРТН (m)	SAMPLE TYP	SPT(N)	WELL INSTALL ATION	DECCI	ואסזייםוכ	PLAS	מור	M.C		LIQUID		ERCENT				
DEI	SAMPLE TYPE SAMPLE NO	(7)	NS		RIPTION	'					21 📤 CI	0 40 Round I			80 ∩W.⇔	-
	07						10	20	30	40	21				80	_
0.0			[<u>.]</u>	}ORGANICS AND SILT — si	ome moss, some roots,											
			[:] <u> </u> :	some snow cover		⅃ ┃									ļļ	
				SILT (TILL) — some grav trace of clay, stif												
- 1.0				fine grained sand												
1.0				greyish brown	2, 1110102 12 1121,											
_																
- 2.0 [™]				4												
- 2.0 -			3	- water at 2.0 m	depth measured after											•
				5 hrs		_]										
-				SAND AND GRAVEL - tro		1 1										
				fine grained, sub												
- 3.0				angular, domp, b	rowii ome sand trace			**********					[)	*****		
				to some clay, law				•								
-				(Vs) 15%, grey	F											•••
				 stiffer drilling 									- !- !			
4.0			9 1	 increasing clay c 	content					ļļ			····!····		4	
				- grinding rock												
-				1											ł	
- 5.0				 grinding rock 											1	٠.,
				= softer drilling												
}			1. 4											.	ļļ	
				4777 - 42707												
- 6.0	Ш			— stiffer drilling		1				- <u> </u>					- 	,,,
				- sample still froze			0									
L				- ice coatings sur		ļ <u>.</u>									ļļ	
				rounded gravels, not melt when he												
- 7.0				: not meit when he : - finish drilling today at		ļ				·					ļļ	
				— continue on 94/04/2												
L				— stiffer drilling, so											ļļ	
	,			- more grinding ro	- ock											
- 8.0				3											<u>.</u>	
														į		
-				– large rock											<u> </u>	
				- soft spot												
- 9.0				WATER LEVEL												
7.0				– more silt-till, so	mo avaganiva											
L				moisture, very co			•									
				frozen	ing, hossini)											***
10.0				- softer drilling												
	TD A	$\overline{\mathbf{r}}_{\mathbf{r}}$	بنست	* I Y	tanta Ita	OGGED	BY:	BCF	• •	·	СОМ	PLETIO	N DEF	TH:	15.4 n	<u>n</u>
	цDА	ĽH	rRm	neering Consul	italits Liu.	REVIEWE	D BY					PLETE:				
1				Whitehorse, Yukon	ı	ig. No:									Page	

MONE	TOR	ING Y	/ELL	INSTAL	LATION	DRILL: CME 750 - HOLL	OW S	STEW	AU	GERS			PI	ROJE	CT I	NO: 1	0201	-11	365	_
VANG	ORD	A MI	NE SI	TE, FA	RO, YUKON	UTM ZONE: 8 N691039	6.14	E58	3908	3.39			El	_EVA	TION	: 11	00.9	73 (r	n)	
SAME	LE PLE	TYPE		GRAE	SAMPLE NO RECOVER	RY STANDARD PEN.		75	mm	SPLI	T SP.	П	CRR	EL B	ARRE	īL .	Sections	NW	CORE	
DEРТН (m)	TYPE	2	SPT(N)	WELL INSTALLATION	SC)IL		■ S1		RD PE 20 -		TION ■ 40	i		20 20	40 PERC 40	ENT S	RAVEL I GO AND @ GO DR FIN	80 80	
DEPT	SAMPLE	SAMPLE	S.	WINSTA	DESCR	IPTION	PL	asti0 10		M.C 	30	ЦС 40	diuk H	*	20	40	E DES	iO	80 10N ◆ 80	4
10.0				30000000	— stiffer, some grind — hard drilliing — grinding rock	ling rock										· · · · · · · · · · · · · · · · · · ·				
- 11 <i>.</i> 0										******										
-					— some hard and so	ft layers														
- 12.0 -					– more very stiff till – sample is quite w				•											
- 13.0	lan manual				– softer drilling							· · · · · · · · · · · · · · · · · · ·								
_																				
- 14.0										ļļ.										
- 15.0																				
-					THE OF POPULAL				o							· · · · · · · · · · · · · · · · · · ·				
- 16.0					END OF BOREHOLE NOTE: - 5 m of water in h															
- - 17.0					- 10.4 m water in h MONITORING WELL INSTALL - 0.15 m sand layer	AΠON														
_					 26 bags sand to: some slough over 1 bag bentonite fr 	5.2 m below grade sand (2 m)														
- 18.0					— install protective of top of PVC 0.76 r	ut + 25 gal. water casing + endcap														
- - 19.0					(a) (b) (1 1 10 0.70)	ii dooro ground														
20.0		D A	ותד.	<u> </u>			OGGE	D R	γ· Βι	<u> </u>				Ico	MPI	FTIO	J DF	пΉ·	15,4 n	_ r
	F,	ВA	Ľľ	ngir	ieering Consult		EVIEW			1								04/2		11

						ONTAINMENT FACILITY	CLIENT: PELLY CONSTR								BORE							
PIEZO						A VIII/AN	DRILL: CME 750 - HO								PRO.							
			~~~~~			O, YUKON  SAMPLE NO RECOVER	UTM ZONE: 8 N69100					o SPLIT	SD	П	ELEV RREL			1100	CCO.			
SAMPL	<u> </u>	IFE	67	Gro	10 3	SAMILTE NO RECOVER	STANDARD PEN		-				IRATI	lust-lus	T T			CENT	CRAVI		INE	1
~	TYPE	9		2	5	αn	ΤT		1	0	20	3	0k	40		20		40	60 SANI	80	<u> </u>	<b>E</b>
DEРТН (m)		SAMPLE NO	SPT(N)	WELL NSTALL ATION	<u> </u>	S0	1L									20		40	60	80		
PTF	SAMPLE	굨	SPT	WELL		DESCRI	PTION	Р	LAST	ric .		M.C.		LIQUI	)	▲ PI 20		IT SIL 40	T OR . 60	Fines 80		DEPTH
끔	\$	ঠ	-	2	É	מוסטנות	I IIUIV		-										DESCR			7 25
0.0	$\vdash \vdash$					NIT (TILL)			1	0 :	20		0.	40	+	20	;	40	60	80	}	0.0
- 0.0					.   }	BILT (TILL) — sandy, some clay, low plastic, fir			ļ								<u>.</u>	ļļ				- 2.0
- 1.0						sands, subangular			ļ				}					j	<del>.</del>	<b>.</b>   .		
-				$[\cdot]$ :	:	to moist, brown			ļ				ļļ.					ļļ	<del>.</del>	<b>.</b>	ļ	- 4.0
- 2.0					:	— soft drilling			ļ	ļļ			<b>!</b> !.					ļļ		ļļ.		6.0
-					1				<u></u>	<u>;</u>			ļ					ļļ		.ļļ.		- 8.0
- 3.0					-				<u>.</u>	ļļ	ļ.		ļļ.					ļļ		ļļ.		10.0
-	X		9			<ul> <li>very little recovery</li> </ul>			•	Í			ļļ.					ļļ		ļļ.	ļ	-
- 4.0				$[\cdot]$		— softer, higher mois	ture content		ļ				ļļ.					ļļ	<del>ļ</del>	<u>.]</u> j.	<u>ļ</u>	12.0
-				:   :					<u></u>	ļļ			ļļ.					ļļ		ļļ.		14.0
- 5.0					1				ļ	ļļ			ļļ.					ļļ	ļ	.ļļ.		16.0
-					4	— harder drilling, mo	e rock		į	ļļ			ļļ.					ļļ		<b>.</b>   .		18.0
- 6.0									ļ	ļ			ļ <b>ļ.</b> .					ļļ		. <b></b> j.		20.0
_	$\boxtimes$		30	$[\cdot]$	:	<ul> <li>more gravel, stiff,</li> </ul>	dark brown with		٥	ļļ				ļ				ļļ		ļļ.	ļ	
- 7.0					. 1	some grey			ļ	ļļ	ļ.		ļļ.			ļ	ļ	ļļ		ļļ.		- 22.0
_					:1		*		<u></u>	į,			ļļ							j.		- 24.0
- 8.0					. [				ļ	ļ			ļļ							<u>.</u>		26.0
-						- more rock, stiffer	drillina		ļ	ļ	ļ.		ļļ.							<u>.</u>		- 28.0
- 9.0							- •		ļ	įj	<u>į</u> .		ļļ.					<u></u>	<u>į</u>	<u>.</u> ]j.	ļ	ŀ
	$\boxtimes$		35		200	— higher sand conter	t, still very		6	<b>.</b>								j		j.		- 30.0
- 10.0						stiff			<u>.</u>		٠إ.		ļļ.					<u></u>		<u>, [, ]</u> ,		32.0
_				目		- soft spot (0.15 m)			<u></u>	ļļ			ļļ.					įį		<u>.</u>		- 34.0
- 11.0									ļ	·			ļļ.					ļļ		ļļ.		36.0
_									<u></u>				ļļ.					ļļ		. <b>]</b> j.		- - 38.0
- 12.0									<u></u>	ļļ			ļļ.					<u></u>		<u>.ļļ</u> .	ļ	
-	$\square$		33			— higher silt and clay	content, more						圖					ļļ		. įį.		40.0
- 13.0				in the same	٦/	greyish in colour END OF BOREHOLE		_/	<u>.</u>				ļļ.							<u>.</u>		- 42.0
_					- 1	NOTE:			ļ				ļļ.							<u> </u>		44.0
- 14.0					ľ	- augers pulled out i	or use on			ļ,			ļļ.					ļļ		<u>.</u>		46.0
						P94-01B			į	įj			ļļ.							.įj.		-
- 15.0						- some slough in ho	le (0.6 m)		<u>.</u>				ļl.						<u>i</u>	<u>.</u> ]l		- 48.0
					1	PIEZOMETER INSTALLATION	b		<u>.</u>				<u>.</u>					<u>.</u>		<u></u>		50.0
- 16.0				1		<ul> <li>0.15 m sand layer</li> <li>1.5 m screen+12.1</li> </ul>	on bottom 2 m, 50 mm PVC pipe			ļ			ļį.					<u>.</u>		į <u>į</u> .		52.0
-						<ul> <li>6 bags sand to 9.3</li> </ul>			į				ļļ.							. <u>[</u> ].		- 54.0
- 17.0						- 0.75 bags bentonit			<u>.</u>		<u>i</u>		ļl.					ļļ		<u>.[[</u>		F
_ ,,,,						<ul> <li>used grout mixed</li> </ul>	from P94-01B			įį												- 56.0 -
- 18.0						- install protective c																- 58.0
- 1040						- top of PVC 0.61 m	above ground		<u></u>		]								Ī		Ī	60.0
- 19.0																			<u>i</u>			62.0
19.0																						-
20.0				L					<u> </u>				<u>.                                     </u>								Ĭ	- 64.0
	EF	3Ā	En	pi	ne	eering Consult	ants Ltd	LOGGE											EPTI		.8 m	
				0.,		hitehorse, Yukon		REVIE		BY	<u>':</u>		-		0	OMF	LETI	94	/04		· ·	4 . 6 4
94/06/01 1	1:01Ah				- 11	michorge, Iukull		Fig. N	0:											٢	age	1 of 1

VANG	ORD	A WA	STE I	ROC	K (	CONTAINMENT FACILITY	CLIENT: PELLY CONST	RUCTIO	N L	TD.				<del></del>						)1B	
PIEZO							DRILL: CME 750 - HO					S	-	J			): 02				
						RO, YUKON  SAMPLE NO RECOVER	UTM ZONE: 8 N6910 Y STANDARD PER					LIT SP.	. m	CRREL			1135	)./93		<u> </u>	
DEPTH (m) HT93	SAMPLE TYPE F	9	SPT(N)	WELL	T	SO  DESCRI	IL		annai .	STAND 0		ENETRA 30	· LILI \TTON ₪ 40 LIQU		21	PEPCE	RCENT 40 RCEN 40 40 NT SIL 40	GRAV 60 T SAN 60	ELE 8 (De) 8	0 0 5 A	ОЕРТН (#)
핌	SAN	SA	"	Server 6	SE	DESCI	.1 11ON		  1	n	20	30	40			ROUN	D ICE 40			N 💠	
0.0						SILT (TILL) — sandy, some clay, low plastic, fir	ne grained										Ì				0.0
1.0						sands, subangular   to moist, brown — soft drilling — EMBANKMENT FILL				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,											- 2.0
																					- 6.0
2.0										*******											8.0
3.0								.,	· · · · · · · · · · · · · · · · · · ·												10.0
4.0						— softer, higher mois -	ture content														- 12.0
																					- 14.0
5.0						— harder drilling, moi	re rock	****					, , , , , , , , , , , , , , , , , , ,								- 16.0
6.0			33			- color changes to b	rownish grey		<b>3</b>			<b>E</b>					*******				- 18.0
0.0					-	END OF BOREHOLE PIEZOMETER INSTALLATION - 0.15 m sand layer															20.0
7.0						<ul> <li>1.5 m screen+6.1</li> <li>5 bags sand to 3.</li> <li>0.75 bags bentonit</li> <li>mixed 6 bags ground</li> <li>install protective contents</li> </ul>	35 m below grade e to 2.89 m It + 80 gal. water									***************************************					22.0
0.8						for both holes P94 — top of PVC at 0.61	-01Å, P94-01B						<b></b>						,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		26.0
9.0																					- 28.0
.J.U																			***************************************		30.0
10.0																					- 32.0
	E	BA	Er	ıg:	in	eering Consult	ants Ltd.	LOGGI		_							ion ie: 9			.4 m	
				_		Whitehorse, Yukon		Fig. N		<u>:-</u>										Page	1 of 1

	E [	TE, F/	ARO, YUKON UTM Z B SAMPLE  NO RECOVERY [	, some	E5889	935.2 5 mm STANDA 0 :	1 SPLI	t Sp. Netrat 30	ON ⊠ 40	ELEV.	20 © 20	N: 113 EL PERCE 40 PERCI 40	37.70 NT GRA 60 ENT SA	NW C	ORE 1 80	- <del>-</del>
TYP	E [	GRA	SAMPLE NO RECOVERY  SOIL  DESCRIPTI  SILT (TILL) - sandy, some gravel clay, firm, low plastic, fine grained sands, subangular damp to moist, brown	STANDARD PEN.	PLASTI	5 mm Standa 0 :	n SPLI VRD PE 20	NETRAT 30	ON ⊠ 40		BARRE 20 20 20	EL PERCE 40 PERCI 40	NT GRA 60 ENT SA 60	NW C	CORE 1 80 80	- F
Τ		Ī	SOIL  DESCRIPTI  SILT (TILL) — sandy, some gravel clay, firm, low plastic, fine grained sands, subangular damp to moist, brown	ON , some	PLASTI	STANDA O :	NRD PE 20	NETRAT 30	ON ⊠ 40		20 20 20	PERCE 40 PERCI 40	NT GRA 60 ENT SA 60	WEL. IIII ) { .ND @ ) {	1 80 80	- F
SAMPLE NO	SPT(N)	WELL WELL INSTALL ATION	SILT (TILL) — sandy, some gravel clay, firm, low plastic, fine grained sands, subangular damp to moist, brown	, some	PLASTI	10					20	PERCI 40	ENT SA 60	ND 😂	80	- F
SAMPLE	SPT(N)	WELL WELL INSTALL AT	SILT (TILL) — sandy, some gravel clay, firm, low plastic, fine grained sands, subangular damp to moist, brown	, some	<del> </del>		M.C	:	\$ 1 m + v -	_	20	40	60	) (		
SAMPL	LdS SPT	WEINSTALL	SILT (TILL) — sandy, some gravel clay, firm, low plastic, fine grained sands, subangular damp to moist, brown	, some	<del> </del>		M.C			1						_ \
SAN		SN	SILT (TILL) — sandy, some gravel clay, firm, low plastic, fine grained sands, subangular damp to moist, brown	, some	<del> </del>		M.V		LIQUII	۱ I		CENT :				הבסדת (#)
7			SILT (TILL) — sandy, some gravel clay, firm, low plastic, fine grained sands, subangular damp to moist, brown		1	Α .		-		L	<u>20</u> ♦ GROU	40 UND IC	E DEC		BO ON A	ㅓ 본
A			clay, firm, low plastic, fine grained sands, subangular damp to moist, brown			<u>U</u> .	20	30	40		20	40	60		80	
A			grained sands, subangular damp to moist, brown													0.
7		1	damp to moist, brown	particles												-
			TADAMIZATE THE ASSTRACT				J		<b>.</b>			<u></u>			<u></u>	
				AI .												- 2.
		Bai H	THE WALLET	<b>1</b> ∟												
				Ì.	įį	<u>j</u>	<u>. j j.</u>					<u>.ii.</u>			<u>]</u>	<u>.</u>  -
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_	1															- 4.
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J	10			j	<b>6</b> 5											- 6
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			1				.ļļ.					<u> </u>			<u> </u>	11
/	_		– very soft, higher moisture	content												
V	7					0										-
4			1	ŀ			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					1				4
		1:														- 1:
			d													
			– firmer, higher plasticity				1					1	1		<b>†</b>	1
		[] [:														- 1
			1	,												] .
1		:   :	d	<b>]</b> "			1		1			1		****	1	· -
/	R		- sorter, dimost wet		ENG	és.										
V	"	:]  :			gan,											- 1
1		:    <u>:</u>		<b>]</b> "												
			- grinding rock													
		:   :	d								<u> </u>					1
		j     .														'
		<u> </u>  ;	 													-
		·   :	– naraer anlling				<u>.</u>					<u>.</u>				
₫			- more gravel, stiff, dark h	rown with												- 2
3		:   -	5		9											
		;   :	- very hard drilling									<u></u>			<u> </u>	
			<ul> <li>higher gravel content</li> </ul>													-2
			9 — 50 mm SS sample with 7	5 blows/foot												[2
	<u> </u>		<u> </u>		VACTO T	V. 7	<u> </u>	<u> </u>					I DEE	<u> </u>	<u>                                     </u>	_
<u></u>	1.3	ıgiı	neering Consultants				ut			160	JUMPI.	LHON	* UEP		.v./ m	1
L BA	LI	C3		1 (46 14 27)	(EWED	RY.					OMPL					
/		BA Er		- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark by same grey  - very hard drilling  - higher gravel content	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling - more gravel, stiff, dark brown with same grey - very hard drilling - higher gravel content - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling - more gravel, stiff, dark brown with same grey - very hard drilling - higher gravel content - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot  BA Engineering Consultants Ltd. LOGGED BY: BCF COMPLETION DEP	- softer, almost wet  - grinding rock  - harder drilling - more gravel, stiff, dark brown with same grey - very hard drilling - higher gravel content - 50 mm SS sample with 75 blows/foot	- softer, almost wet  - grinding rock  - harder drilling  - more gravel, stiff, dark brown with same grey  - very hard drilling  - higher gravel content  - 50 mm SS sample with 75 blows/foot

VANGOR PIEZOME					CONTAINMENT FACILITY	CLIENT: PELLY CONSTRU DRILL: CME 750 - HOL				ICFF	15								4-0 1136		
					ARO, YUKON	UTM ZONE: 8 N691015												.70			<del></del>
SAMPLE					B SAMPLE NO RECOVER		// <u>L</u> 3			m SP	IIT S	P.		REL I					M CO	RF	
	اند	2	<u> </u>	WELL INSTALL ATTON	<u> </u>	)IL	DI	-	TAND	ARD F 20		RATIC			20 20 20 ▲ PE	PER PEI	Cent 10 3Cent 10 17 Sil	GRAVI 60 SANI 60 T OR	EL BI 80 0 @ 80 FINES	) <u>A</u>	DEPTH (A)
٦	NA S	3	υ,	SN.	DESCR	IPTION		10		20	30	)	40	4	20 GRC 20	UND	10E ( 10	60 DESCR 60	28 4011918 28	10	씽
7.0				(																	- 24.0
8.0											**************************************								***************************************		- 26.0
				=	— softer with higher	moisture															- 28.4
9.0																					- 30.
10.0					— higher sand conte damp to moist, br — water at 10.0 m (	own										***************************************					- 32.
					94/05/03 - 50 mm SS sampl	a with 42 Nows ner															- 34.
11.0					foot END OF BOREHOLE	5 mm 12 0/0m0 por		•	<b>)</b>					***************************************							- 36. -
					NOTE:  - augers pulled out P94-02B - some slough in he	ole (0.46 m)									***************************************						- 38.
12.0					- 6 bags sand to 7	on bottom 4 m, 50 mm PVC pipe 62 m below grade															- 40.
13.0					<ul> <li>0.75 bags benton</li> <li>mixed 4 bags gro</li> <li>for both holes 94-</li> <li>install protective of</li> <li>top of PVC 0.53 r</li> </ul>	ut + 50 gol water -02A, 94-02B asing + endcap					***************************************										- 42.
		and the second s			139 5.7 10 0.30	<b>g</b> , ou.u				***************************************		***************************************			***************************************						- 44. -
14.0	<u></u>		77	<u> </u>		( ) T ) 7	OGGE	n p	y, n	ine Ine		<u> </u>			OMB	1 571	ONIF	)EIII	J. 10	17 =	
H	īΒ	A	Ľn	gli	neering Consult		REVIEW											/04 1/04		.7 m	
				~	Whitehorse, Yukon	1	ig. No		וום				<del></del>	-10	UMP		34	104		age :	2 24

OMETER INSTALLATION  ORDA MINE SITE, FARO, YUKON  ORDA MINE SITE, FARO, YU	910155 E PEN.	E58	389	33. 5 m	.3 m 8		T SP.	пп	El					201 - 7.63			
STANDARD  STANDARD  SOIL  SOIL  DESCRIPTION	PEN.	E	75 S	5 m	m S	SPLI	T SP.	ПП		LEV#	MIOITA	N: '	113	7.63	2 (n	1)	
SAMPLE TYPE SAMPLE TO SPIT(N)  SPIT(N)  WELL  MELL  ME			S S			SPLI	T SP.	1 11 1						-	<u>-</u>	<u> </u>	
				TANI				1111	CRF	REL 8						ORE	
			<u>-</u> -	)	JAKL 20		NETRA 30	TION ■ 40			20		rcent 40	GRA 60		i 30	l _
											•	» PE	RCEN	IT SAI	4D 👁		1 里
											20 A PF		40 VT 51	60 LT OR		80 S.A	DEPTH
		PU	asti(	C		M.C.		ЦQU	ID		20		40	60	;	80	一
		1	10	 )	20		30	40		•	>GR0 20		) ICE 40	DESC 60		ON � 80	
THE THE LABOUR CHILL TO SUNDA, SUITE UTUACION SULLE			1	Ī	1	1	Ť	i		I	Ť		1	Ť		ΪΤ	0.0
clay, firm, low plastic, fine					∤.	·					<b>.</b>		. į	·		<b>∤</b> ∤	··- 2.0
grained sands, subangular particles										ļļ.			.ļ	ļļ.		ļļ	<del> </del>
damp to moist, brown	L.			. İ											İ		- 4.0
- EMBANKMENT FILL MATERIAL				:													- 6.0
	"	····• Î		***	***					   	***						-
		į.	<u>.</u>		<u>i</u> .							- <del> </del>				<del>                                     </del>	8.0
		<mark>.</mark> .										j	.ļ			<b>.</b>	
- very soft, higher moisture content		<u>.</u>			<u>l</u>					<u> </u>	İ	<u>.l</u>	<u>.l</u>		<u>i</u>	<u>]].</u>	
	1	į			į										į		- 12.0
│ │ │ │ │	]"		••••					*****		1		·			···•	1	14.0
aption almost wet		····‡								···		- <del> </del>	·	<del> </del> -		<del> </del>	" -
- softer, almost wet		<b>.</b>			ļ.					<u>.</u>				<u>.</u>		ļļ	16.0
								]		ļ				ļ		<u>.</u> jį	18.0
hasder delling	,																-
\ harder drilling END OF BOREHOLE		····	····								i	Ï					~- 20.0
END OF BOILDINGE	"	····•	{-										·}	<u> </u>		<u> </u>	- 22.0
NOTE:										<del> </del> -			· [	ļ		<del>.</del>	}-
- some slough in hale (0.15 m)										ļ		.j	.ļ	ļļ.	ļ	ļļ	_ 24.0
PIEZOMETER INSTALLATION																	26.0
- 0.15 m sand layer on bottom																	F
- 6 bags sand to 3.05 m below grade	"		**	***	***						·	·	·	***		†	·· <del> -</del> 28.0
- 1.5 m screen+6.09 m, 50 mm PVC p	pipe  -	<u>.</u> .		<u>.</u>						····		<b>;</b>				<b></b>	30.0
- 0.75 bags bentonite to 2.59 m		<del>!</del> .								ļļ.		.ļ	.į,		ļ	ļļ	
- mixed 4 bags grout + 50 gal water										ļ <u>.</u>			.]	<u></u> j.			- 32.0
for both holes 94-02A, 94-02B - install protective casing + endcap																	- 34.0
- top of PVC 0.56 m above ground		****		****			···										" <u> </u>
top of the diagram above greater													ļ				
													.ļ	<b>.</b> .		ļķ	- 38.0
														<u>,</u> ,		<u></u>	
												į					- 40.0
	"									"   "						1	42.0
	.,	· <del>}</del>			<u>i</u> .				•	<del> </del> -	<del>.</del>		<del></del>	<u>-</u>		<u></u>	" <b> </b> -
						<b>]</b>				ļ <u>ļ</u> .		. <u>i</u>	. <b></b> .	<del> </del> -		<b>  -</b>	44.0
												. <b>.</b> j	. <b>į</b>	ļ		ļļ.	46.0
																	+
	ľ		-										-				- 48.0
						····				"			· [·····				- 50.0
		<u>‡</u> .	<u>.</u>							ļ <u>.</u>				<del> </del> -		<b>  -</b>	·· -
										ļ <u>.</u> .			. <b>.</b>	ļ <u>ļ</u> .		ļļ	520
		<u>Ì</u>			<u>į</u> .					<u> </u>			į		<u>.</u>	<u>i</u>	54.0
	ľ						-							ľ			-
EBA Engineering Consultants Ltd.	LOGO									Ţċ	OMP	LET	<u>i</u>	DEPI	ዝ: 5	.6 m	
	REVI	IEW	ED								-			4/04			
Whitehorse, Yukon	Fig.	No	:													Page	1 of 1

VANGO	ORDA	\ WA	STE F	ROCK	< C	CONTAINMENT FACILITY	CLIENT: PELLY CONSTR	UCTIO	N L7	ΠD.					BORE	HOL	E NO	):	P92	1-(	)2C	
PIEZO							DRILL: CME 750 - SOL								PROJ						65	
						RO, YUKON	UTM ZONE: 8 N69101								ELEV					·		
SAMP	LE ]	IYPE		GR/	AB	SAMPLE NO RECOVER	y Standard Pen.	E				UT S	P. [] RATION	<u></u>	REL			L.,	GRAVE	W C	ORE	T
~	닖			=	2	~~	**		10		20 20	30 30	40 40			20	4	0	60	8	0	
ОЕРТН (m)		SAMPLE NO	≘	{	NSIALATION	S0	<b>IL</b>									20	PER 44		SANE 60	(a) (3)	٥	ОЕРТН (Ң)
Ħ	님	교	SPT(N)	딣	7	עבממחו	יייים אין		LASTI	n	11	.c.		IQUID		▲ PEI	RCENT	SILT	ORI	TNES	5 <b>A</b>	1
DEI	SAMPLE TYPE	S	υ,	5	2	DESCRI	PHUN	'	—— ——			.v. \$		1401D -		<u>20</u> ≽∩270	4HND		60 ESCR		0 N 🐟	님
8.8				4					10	)	20	30	40	<u>.</u>	<u> </u>	20	4		60	8		
0.0				۱۱	:   :	SILT (TILL) — sandy, some																0.0
L						clay, firm, low plast			įį			ļļ								į		
Ì					4	grained sands, subo damp to moist, bro		-										•				2.0
- 1.0						- EMBANKMENT FILL				l.												-
- 1.0						partition of the second of the second	17 17 19 19							Ī								- 4.0
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-					- 1				Ĭ					Ī								<b>T</b>
0.0					٠,													i				- 6.0
- 2.0					: }						1			1		····						-
				•	. 1																	- 8.0
-					•										Ì				<u> </u>			
7.0					:																	
- 3.0						- some pieces of ph	yllite rock		*****			1			1							10.0
	H																					-
-	IXI		13	•							1			1	1				<u> </u>			- 12.0
	H			<b>)</b> .	• ]																	
- 4.0					-				†····													
																						- 14.0
L-				-	:]				†**** <b>†</b>		··•		****	***	1				· <del>-</del>	-	·····	}
					- 4									:								- 16.0
- 5.0					:1				1-1		<del></del>							••••	·		<del> </del>	1
					•																	
-									ļļ			ļj								į		- 18.0
					:																	-
- 6.0					:				-							<del> </del>						- 20.0
				1.	: ]	- higher moisture co	ntent, softer															
-	M		13			- 15 - 20% phyllite			ļļ.			<b></b>										
	$\triangle$		10	:	:}					HESS:												- 22.0
- 7.0						— color changes to li	aht beaug		<del> </del>  -		******	ļļ.,			·		-		<del>.</del>			+
				Ì.	:	- very hard drilling -																24.0
-						- too hard to penetr			ļļ		<u></u>	ļļ.								ļ		
						on auger drill																
- 8.0						— softer, color chang	es to reddish	ļ	ļļ.			ļļ										- 26.0
						brown	D1											:				-
-					:	Original Ground Surface at — color changes to y					. <u>†</u>	<u> </u>			.		- <del> </del>		ļ			28.0
					[]	color chundes to A	CHOMISH DIOMH				:											L
- 9.0									ļļ		إ	ļļ.,					ļļ		<u>į</u>			
																						- 30.0
-						– light brown, higher	maisture		ļļ	ø :	. <b>ļ</b>	ļļ			-  <del> </del>		ļļ		<u></u>			<u> </u> -
						ngite brown, mgnet	TIMOLOGO															- 32.0
10.0	╚							1000				<u> </u>	<u> </u>	<u>:</u>		1						
	EE	3A	En	gi	n	eering Consult		Logge Reviev			CF										2.7 m	
				J		Vhitehorse, Yukon	Ľ	Fig. N		ונט					- -	UMPL	LIL	94	/04/		Onne	1 of 2
24/06/01	11:044	1					J'									····					-30	

PIEZO					N RO, YUKON	DRILL: CME 750 - SOL UTM ZONE: 8 N69101								PRO. ELEV						35	
SAMP					SAMPLE NO RECOVER	-l					PLIT	SP.	ПС	RREL			123		W C	DRE	
DEPTH (m)		SAMPLE NO		WELL	<b>F</b>	)IL		LAST	STAN 0	DARD 20	PEN	ETRATI SO	ليدليلييا	)	20 20 <b>a</b> Pf 20	PER PER PER PER PER PER PER PER PER PER	40 RCENT 40 IT SIL 40	GRAM 60 SAN 60 T OR 60 DESCR	EL IIII 8/ 8/ 8/ FINES 8/	0 0 5 <u>A</u> 0	рертн (rt)
10.0									(*****)								<b></b>		******		- 34.0
- 11.0					— grinding rock																- 36,0
- 12.0																					- 38.0
_ <u>Ā</u>					— water at 12.5 m c 94/05/03	lepth measured on			٩	,											- 40.0 <u>*</u> - 42.0
- 13.0					END OF BOREHHOLE NOTE:  - hale sloughed and	had to be re-															- 44.0
- 14.0					drilled to 13 m PIEZOMETER INSTALLATION — 0.15 m sand layer	on bottom		· · · · · · · · · · · · · · · · · · ·							,						- 46.0
- 15.0					<ul><li>0.5 bags bentonite</li><li>mixed 1 bag grow</li></ul>	2 m, 50 mm PVC pipe to 8.85 m t with mixture				***************************************											- 48.0
					remaining from GW — install protective c — top af PVC 0.61 n	asing + endcap		•		*************							<b>.</b>				- 50.0 - - 52.0
- 16.0																					54.0
- 17.0								***************************************													- 56.0
- 18.0								····											(2222)		- 58.0
																					- 60.0
- 19.0				**************************************																	- 62.0 - 64.0
20.0																***************************************					-
	EF	3A	En	ıgir	eering Consult		Loggi Revie											)EPT)  /04,		2.7 m	
	11:05Ak				Whitehorse, Yukon		Fig. N	_									v I	, - '		^J age	2 of 2

VANGO	ORDA W	aste i	ROCK	( C	ONTAINMENT FACILITY	CLIENT: PELLY CONST	RUCTIO	N L	īD.				f	30RE)	IOLE	. NO	: F	94	-03	4
	METER					DRILL: CME 750 - SC								PROJE						
		-			RO, YUKON	UTM ZONE: 8 N6910								LEVA			33.6	-	<u> </u>	
SAMP	LE TYP	Ł 📓	GR/	AB :	SAMPLE NO RECOVER	y Standard Pen	<u>'. E</u>				PLIT S	P. [[ RATION	لسف	REL B		PERCE			CORE	
$\sim$	出。		=	2		w.w.		10		20	30 30				20	40		60	80	
ОЕРТН (m)	SAMPLE TYPE SAMPLE NO	12	75	NSIALLAIDIN	S0	11.									20 20	PERC 40		sand 60	® 80	DEPTH (#)
표	빌급	SPT(N)	E S	7	בוממח	DWIAN	0	LASTI	r.	1	I.C.	1	IQUID		PER	CENT	SILT	OR FI	NES A	
B	景ま	"	2	2	DESCR	IPHUN	ľ	J			۱ ن		-		20 CROU	ND IO		SCYRIE	<u>80</u> TION �	- 님
								10	)	20	30	40	)		20	40		60	80	100
0.0			$ \cdot $	: ] :	SILT (TILL) — sandy, some															0.0
			$ \cdot $	:	clay, firm, low to n fine grained sands,															<u> </u>
-				1	particles, brown an		-	<b>†</b>		••••				<del></del>	••••••			·		- 2.0
			3		paraologi bronn an	4 9,0)														2,0
- 1.0								įį			<u>.</u> ]],			<u>                                     </u>		<u>.</u>		. <u>.</u>		
1.0																	i			- 4.0
			$ \cdot $	:						i										7.0
-		İ	[:	:				<b>†</b>  -						<del> -</del>				·‡		
				:4-	– seasonally frozen (	Nbn) to 1.7 m							i							- 6.0
- 2.0					- damp to moist	(11011) 10 117 111				<u> </u>							<u>.</u>	<u>.ii</u>		
2.0				:	,,															-
		1	$ \cdot $	:																
-				:1	•			ļļ						·		<b></b>		·		8.0
					•				:				į							-
- 3.0								<u>.</u> j												
- 3.0	$\square$		$[\cdot]$	:	- softer															10.0
	IXI	8							<b>a</b>								į			-
-	$\square$		]]	1				ļļ					<u>į</u> ,	.  <u>.</u>		ļļ.				
				-											:					- 12.0
- 4.0																				
4.0			:	:}																
			$ \cdot $														Ì			- 14.0
-				:1									<del>.</del>	ļ <u>.</u>		ļļ.		·		
			4	:																
- 5.0									:											15.0
- 2.0			[:]				*14>									}		1		***
				:	<ul><li>stiffer</li></ul>															
-			3	:1				ļļ.						ļ		ļļ.		ļ		
				:4																
				ا																
- 6.0	H		:]	-																20.0
	ΙΧΙ	11	<u> :</u>																	
~	$\square$			."]				ļ						ļ <u>ļ</u>		<b></b>		ļļ		[
			4																	- 22.0
- 7.0			<b> -  </b>	:																
7,0				: ]			1													
			:	-					•								i			- 24.0
-			3	.4				ļļ			ļļ.,		<del>į</del>	ļ <u>.</u>		ļļ.		ļļ		
			4	:																t
8.0			-							:										- 26.0
	ERΔ	Er	ισi	n/	eering Consult	ants Ltd	LOGGE												13.5	
	د ع السند السيد	. الليات	6"		Whitehorse, Yukon	WILLOW TIOM.	REVIE		BY:	:				CO	MPLI	ETE:	94/	04/2		1
				11	THINGHOLDE, LUXUH		Fig. N	O:						L_					rag	e 1 of 2

SAMPLE	RDA M E TYP	INE S	ITE, F.	ON ARO, YUKON B SAMPLE  NO RECOVER	DRILL: CME 750 - SOI UTM ZONE: 8 N69101		AFT	AU	GER	RS			PRO	NEC	T N	0: 0:		-113	365	
DEPTH (m) PERMISSION CANADISTRACT	E TYP	E 🖺			UTM ZONE: 8 N69101	00 74														
DEPTH (m)	1 2		GRA	B SAMPLE   / INO RECOVER	.)							min .				113	3.67	<u> </u>		
DEPTH	PLE NO			1 3 WILLE	y Standard Pen.	<u> </u>	_			PLIT		Lulled	RREL				L CD		CORE	T
DEPTH	YE IY		2	:	- T- T-		國 S [1]		20	PENE 3	0	NN 201 40			0.	RCEN 40	6	)	80	
0	취료	2	1	SC SC	)iL									2	<b>⊜</b> F !0	ERCEI 40	VT SA 19		80	T.
0	-13	SPT(N)	WELL NSTALL ATION	DESCR	TOTTON	PI	.asti	IC.		M.C.		LIQUI	$\Gamma$			ENT S				DEPTH (ft)
8.0	3 3	"	N N		IF HON	'-	<u> </u>						-		roun	40 ID ICE	DES		80 ON �	
0.0		-	<del> </del>				11	0 :	20	- 3	0	40	_		0	40	61		80	<b>-</b>
				<ul> <li>– softer</li> <li>– higher moisture or</li> </ul>	ontent, color															-
_				changes to brown	our our our or															
•			<u>:</u>   -	Original Ground Surface a	t 8.5 m															28.0
			<u>:</u>																	-
- 9.0				4							ļļ				<b>!</b>  -	<u>ļ</u>		∤	<b></b>	70.0
7	7																			- 30.0
_  )	XI	24						9			<u> i.</u>			<u>.</u>	<u>[]</u> .		<u>.</u> į	[	<u>.jj.</u>	. -
- 1	4			1																70.0
				,		-  -														32.0
- 10.0			<u>'</u>	1			.,,,,		<u>.</u>		 			 !	 				1	+
																				- 34.0
-											ļļ				ļļ.		ļļ		ļļ	. 34.0
	-																			-
44.0																				36.0
- 11.0									***		}(					(	!***			30.0
																				-
-											ļļ			ļ	ļļ.					. 38.0
				- more stiff																L 20'0
- 12.0																				-
- 12.0			目																	40.0
Λ	$\sqrt{}$																			10.0
-  /	Λ	22						•		1	ļļ			ļ						+
-	_																			42.0
- 13.0											ļļ				į <u>į</u> .				.j	
																				-
																				44.0
-						}								š	<u>.</u> .					1
1				END OF BOREHOLE		-														<b> </b>
- 14.0				NOTE:													ļ		.ļļ	46.0
				- 0.15 m slough to	13.6 m															
				PIEZOMETER INSTALLATION  - 0.15 m sand layer	an hattam															<u> </u>
					2 m, 50 mm PVC pipe				··· <b>?</b>				***							48.0
				- 3 bags sand to 11	1.0 m below grade															
- 15.0				- 0.5 bags bentonite	to 10.5 m						<u>.</u>				<u>i</u> .				ļļ	1
				- used grout mixed																- 50.0
				<ul><li>install protective c</li><li>top of PVC at 0.6</li></ul>										į	<u>j</u> .		<u></u> j		<u></u>	
				10p 01 1 10 dt 0.0	aboto ground															Γ
16.0								į												- 52.0
	<u>,                                    </u>	T _r ,	1011	neering Consult		LOGGE				:	: :	: :	- 10	COM	PLE	TION	DEP	: TH: 1	13.5 m	 
Г	HUננ	Lil.	ıRıı		ants Ltu.	REVIEW	ŒD									TE: 9			}	
94/06/01 11:0	OSAM			Whitehorse, Yukon		Fig. No	): 												Page	2 of 2

VANGO	)RD/	A WA	STE F	ROCK	CONTAINMENT FACILITY	CLIENT: PELLY CONSTR	UCTIO	V L	.TD.					BORI	EH0l	ΕN	10:	P9	4-	03B	
PIEZ0						DRILL: CME 750 - SOI								PRO							
					ARO, YUKON	UTM ZONE: 8 N69101								ELEV			1133		<u> </u>		<b>"</b>
SAMP	LE	TYPE		GRA	B SAMPLE NO RECO	very 🔀 standard pen	· , E	-			PLIT			RREL				لسائلسا	NW C		
_	ابيا		Ì	_	-				SIAN O	10aku 20		EIKAI 30	TЮN ₪ 40		20		rueni 40	GRA 60	/El 🛮	30	
ОЕРТН (m)	SAMPLE TYPE	SAMPLE NO	9	WELL		SOIL									20		RCEN 40	IT SAI 60		30	<b>E</b>
王	띨	딢	SPT(N)	E S										-					FINE		DEPTH
ED.		₹	22	7.2	DESC	RIPTION	PI	AST	nc		M.C.		LIQVID	L	20		40	60		30	出
lI	S	0,		Negati de tana				1	0	20		30	40	•	♦ CRO 20		ICE 40	DESC 60		XN � 303	
0.0			1		SILT (TILL) - sandy, sa	ome gravel, some			Ì	Ī	T	T			T	ī		Ĭ			0.0
<del>.</del>				1	clay, firm, low t	o medium plastic,					ļ	ļļ			ļļ					ļļ	
				4	fine grained sar																2.0
- 1.0					particles, brown	and grey		·			<u> </u>	·····						····		ļ	t.,
				[:] [	1											i					4.0
•				-						Ĩ	i					Ī					-
- 2.0				4		en (Nbn) to 1.7 m						ļļ				ļ				ļ <u>i</u>	- 6.0
					- damp to moist																
•										••••	·	1				- <del> </del>		***		<u> </u>	8.0
- 3.0																<u>. į</u>					J.,,
3.0					- softer																10.0
-									·····								·			<b>}</b>	1,,,
																					12.0
- 4.0												1				·		····		****	14.5
_							[		ļļ	ļ.		ļļ						ļ.		ļļ	- 14.0
					4	_										į					- 16.0
- 5.0													···				•		<del> </del>	<del></del>	[10.0
					- stiffer																18.0
-				3	4			••••													10.0
- 6.0									ļļ			ļļ								ļļ	- 20.0
																					7 20.0
-					<u>*</u>							1								<u> </u>	- - 22.0
- 7.0																					[ 22.0
7.0					<u> </u>					- ;											- 24.0
-					– softer				į <u>į</u>											ļķ	. 24.0
					— sorter — higher moisture	content colour										!					- 26.0
- 8.0				1:1	changes to brow						[	*****								····	20.0
-									<b></b>			ļļ				ļ				ļļ	- 2B.0
					Original Ground Surfac	e at 8.5 m															20.0
- 9.0					₹ \$				ļļ			-							<u>.</u>	<u> </u>	- 30.0
					END OF BOREHOLE																
					PIEZOMETER INSTALLATI	ON															- 32.0
- 10.0					- 0.15 m sand lo				ļ)			ļļ								ļķ	
					- 1.5 m screen+	9.14 m, 50 mm PVC pipe				ì											- 34.0
-					- 3 bags sand to	6.55 m below grade		****		*****		1 1								ļ <u>†</u>	
- 11.0					- 0.5 bags bento				ļ <u>.</u>											<u> </u>	36.0
						grout + 50 gal. water													i		-
-						e casing + endcap )3A and P94—03b	ļ		ļļ			<b>!</b>				.,.				ļ <del>.</del>	38.0
. 12 ^						1 m above ground				;											
- 12.0					100 011 100 010	soors ground						*****								<b></b>	40.0
_							ļ		ļļ			ļį					ļ	ļ		ļļ	+
																			i		- 420
	ויקן דיקן	D A	T7~~	. : س	againa Canas	ltonta Ita	LOGGE	D F	<u>: :</u> 3Y:	BCF	;	<u>;                                    </u>	1 1		OMP	LETI	ON I	DEPT	: H: 9	.1 m	J
	Ll	IJΑ	L1	ığı.	neering Consu	manus Liu.	REVIEW								OMP						
K278271	17 KM7				Whitehorse, Yuko	Ω	Fig. No	o:											***************************************		1 of 1
4/06/01	1 12/A	ali.																			

VANG	ORDA 1	WAST	E RO	CK	CONTAINMENT FACILITY	CLIENT: PELLY CONSTRU	CTIO	N L	TD.					BOI	REHO	)LE	NO:	PS	<del></del>	04A	
PIEZO	METER	RINS	TALL	OITA	N	DRILL: CME 750 - SOLI								-					-113		
					RO, YUKON	UTM ZONE: 8 N691014	2.2						F-37-3					***************************************	9 (m	<del></del>	
SAME	LE TY	PE		GRAE	SAMPLE NO RECOVE	ry 🔀 standard pen.	Ļ		5 mi				KON 🔯	CRRE				Annual Property	NW C		Т
	H c			z	Q.(	\ T.T.		11		20		O O	40 40			0	40	60	) {	30	
ОЕРТН (m)	SAMPLE TYPE	SAMPLE NO	2 -	WELL INSTALLATION	SC	)] <u>L</u>									2	<b>⊜</b> P 0	ERCEI 40	NT SA 60	ND @	30	оертн (п)
P.H.	밀	<u>ا ا</u>	SPT(N)	国	DEGCD	IPTION	P	LAST	IC	1	A.C.		ЦQU	ID					RFINE	S & 30	良
님	SA	5		£	DESCI	IL HOM	'	<b> </b>			<b>\$</b>		-	<u> </u>		<u>o</u> Roun	40 D ICE	60 DESC	CRIPTIC		
0.0		-		T 7.	CUT (TILL) agady com	a gravel some		11	0	20	3	0	40	-		0	40	60	1 8	30	0.0
0.0			:		SILT (TILL) — sandy, som clay, low plastic, b																0.0
			;		some rock pieces	3.07,			i												
Γ					- EMBANKMENT FILL																- 2.0
			:		<ul> <li>seasonally frozen</li> </ul>	to approx. 2.4 m															
- 1.0			<b>b</b> .								·-				·		·	1 **		<del> </del>	•
				1:			1														- 4.0
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			-																		
			-[:																		- 6.0
- 2.0			ľ.				****			···					1		· · ·			1 1	1
			:																		
-			:		— softer drilling, hig	her moisture		ļ								ļļ.		ļ <del>ļ</del>		ļ <b>ļ</b>	- 8.0
			:	i																	-
- 3.0																				<u> </u>	
3.0	$\square$		:	:] [:																	10.0
	IXI		13						45												ļ.
-	H																	1 1		<del>  </del>	100
																					- 12.0
4.0				(				ļ								ļļ.		ļļ		ļļ	ŀ
			-																		- 14.0
																					14.0
			:																		+
			:																		- 16.0
- 5.0			1.															-		ļķ	
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L			;					<u>.</u>												<u>.</u>	- 18.0
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			ŀ																		r
- 6.0			[:												1			11			20.0
	IXI		15						<b>*</b>												
F	$\square$															<u> </u>		ļļ	<u>.</u>	<b></b>	.[
																					- 22.0
7.0			ļ.					ļ													
			:																		
										:											- 24.0
<u> </u>			:				-	<u></u>												<u> </u>	-
			:																		
8.0			<u>.</u>				0005	T	y. r	100	<u>:</u>		ļ			(D) C	TION.	DC-	<u> </u>	0.4	- 26.0
	EB.	A ]	Ľng		eering Consult		ogge Eviev					3.							TH: 1 4/28	2.1 m	<u> </u>
					Whitehorse, Yukon	<u></u>	ig. N		<u> </u>			_			UVIF	11 L-L-		. 1/ V			1 of 2
94/06/01	11:0844																			<del></del>	

					CONTAINMENT FACILITY	CLIENT: PELLY CONSTR										1-04	A
PIEZON					ARO, YUKON	DRILL: CME 750 - SOL UTM ZONE: 8 N69101									3.909	11365 (m)	***************************************
SAMPL					B SAMPLE NO RECOVER					PUT SP		REL B				W COR	-
	1	SAMPLE NO	$\overline{}$	WELL	SC DESCR		PL	STA 10  ASTIC	20	PENETR 30 I.C.	ATTON B 40  LIQUID 40		20 20 20 PERC 20	40 Percei 40 Ent Si 40	60	80	OEPTH (ft)
8.0					— stiffer drilling, obv color, higher sond Original Ground Surface A	content											- 28.0
- 9.0	X				<ul> <li>quite stiff, almost</li> <li>dry silt powder wite</li> <li>phyllite rock</li> <li>grinding rock</li> </ul>		 •										- 30.0
- 10.0				300000000000	— very stiff drilling								# # # # # # # # # # # # # # # # # # #				- 32.0
- - 11.0					— herd dry till, light	grey											- 34.0 - - - 36.0
- <u>Ā</u>					– water at 11.6 m a 94/05/03	lepth measured on											- 38. <del>V</del>
- 12.0 -	X		80	31-1	END OF BOREHOLE									*****			- 40.0
- 13.0					PIEZOMETER INSTALLATION  - 0.15 m sand layer	2 m, 50 mm PVC pipe											- 42.0
- 14.0					- 0.5 bags bentonite - mixed 3 bags grown for both P94-04A - install protective of the top of PVC 0.61 m	e to 9.1 m ut + 40 gal. water and P94—04B asing + endcap											- 44.0 - - - 46.0
- 15.0						,											- 48.0
- -																	- 50.0
16.0						,	0000	m m.	<u> </u>				117	71611			- 52.0
	EΒ	A	En	giı	neering Consult Whitehorse, Yukon	ants Ltd.	LOGGE REVIEW	(ED) B							DEPTI 4/04,		
94/06/01 1	HARO: I				"HITCHOLSE, TUKOH		Fig. No	X							····	Pag	je 2 of 2

					CONTAINMENT FACILITY	CLIENT: PELLY CONSTRU	JCTIO	N LTI	).									-04B	
PIEZO						DRILL: CME 750 - SOL											-11:		
			SIT	_	RO, YUKON	UTM ZONE: 8 N69101											26 (r		
SAMPL	LE TY	PE.		GRA	SAMPLE NO RECOVERY	STANDARD PEN.	<u> </u>				T SP.	اسالسا	REL			والقاربيا	NW (		<del></del>
_	ے ابیا							■ ST.		OD PE O	NETRAT 30	TЮN <b>⊠</b> 40		20	PERC 4(		RAVEL E	80 80	
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10.0					- 0.5 bags bentonite												ļļ	ļļ	[_
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.					<ul> <li>install protective co</li> </ul>	sing + endcap											ļķ		34.0
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11.0												<u> </u>	·-	<u>.</u>			ļļ		36.0
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	11171			٥	Whitehorse, Yukon	Ľ	REVIEW Fig. No		3Y:					OMPI	ETE:	94/	04/29		1 of 1

# APPENDIX B Results of Laboratory and Field Testing

## CONTENTS:

B-1	Proctor Compaction Test Results Channel Base Seal
B-2	Proctor Compaction Test Results Rock Pile Cover
B-3	Gradation Test Results Shot Rock Cover
B-4	Density Test Results Channel Base Seal
B-5	Density Test Results Till Cover

Proctor Compaction Test Results Channel Base Seal EF

	SITY RELATIONSHIP nation D698, D1557
Project Number: 0201-11365	Sample Number:
Project: Vangorda Waste Dump Rehab.	
Address: Faro, YT	
Date Tested: March 31, 1994 By: JSB	Sample Description: SILT (TILL)-sandy.
Client: Pelly Construction	some clay, some gravel
Attention:	
	Maximum Dry Density: 2020 kg/m ³
	Optimum Moisture Content: 12.0 %
2400	Natural Moisture Content:%
	Standard Proctor (ASTM D698)
2500	☐ Modified Proctor (ASTM D1557)
	Hammer Weight: 2.494 kg
2200	(10.4.0
	3
2100	
	No. of Blows/Layer: 25
2000	Diameter of Mold: 101.4 mm
A WINCIPLE TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TO THE TOTAL TOT	Height of Mold: 116.3 mm
	Volume of Mold: 0.000938 m ³
£ 1900 # 1900	Compactive Effort:iu/m³
1900 (P) - 1800 (P) (O) (S) (P) (O) (S) (P) (P) (P) (P) (P) (P) (P) (P) (P) (P	Reviewed By: R. Trimble P.Eng
	To Marine
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1800	
1500	
1400	
1300 Effects 111111111111111111111111111111111111	25 30 35 40

Moleture Content - (♥)

Dain presented hereon is for the sole use of the attpulsted dient. FRA is not responsible, not can be held liable, for use made of this report by any other party, with or without the knowledge of EBA.

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**Proctor Compaction Test Results Rock Pile Cover** 

#### MOISTURE - DENSITY RELATIONSHIP

ASTM Designation D698, D1557, or D2049

Project No.: 0201-11365	Sample No.:
Project: Vangorda Waste Rock Containment	_ Sample Location:
Address: Faro, YT	Sample Description: SILT - gravelly, some
	sand
Date Tested: June 8/94 By: PJM	_ Minimum Dry Density:kg/m ³
Client:	Maximum Dry Density: 2115 kg/m ³
Attention:	0.0
2300	Natural Moisture Content:
	Compaction Standard: Standard Proctor
2200	
2200	
	Hammer Weight: 2.494 kg
2100	Hammer Drop:mm
	No. of Layers:3
2000	No. of Blows/Layer:56
	Diameter of Mold: 152.4 mm
100	Height of Mold: 116.5 mm
E 1900 CE 2 S	Volume of Mold:
y	Surcharge Weight:kg
1800 Separate 1800	Vibratory Amplitude: mm
Dens.	Vibratory Frequency:vib./min.
1700	Vibratory Time: min.
1700	Compactive Effort: 590.3 kJ/m ³
	0117.11
1600	Reviewed By WWW.Eng.
1500	
1400	
1300	
0 5 10 15 20 Moisture Conte	25 30 35 40

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#### MOISTURE-DENSITY RELATIONSHIP

ASTM Designation D698, D1557

Project Number: 0201-11365	Sample Number:
Project: Vangorda Waste Rock Containment	Date Sampled:
Address: Faro, YT	Sample Location
Date Tested: June 8. 1994 By: PJM  Client: Pelly Construction	
Attention: Mr. Bill Dunn	
	Maximum Dry Density: 2230 kg/m ³
2400	Optimum Moisture Content: 7.5 %
	Natural Moisture Content:%
2300	☐ Standard Proctor (ASTM D698)
2500	☑ Modified Proctor (ASTM D1557)
	Hammer Weight: 4.5 kg
2200	Hammer Drop: 457 mm
	No. of Layers: 5
2100	No. of Blows/Layer: 56
	Diameter of Mold: 152.4 mm
2000	Height of Mold: 116.5 mm
	Volume of Mold: 0.00212 m ³
2 1900	Compactive Effort: 269.3 kJ/m ³
1900 - (kg/H) - (kg/H) - 1800 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700 - 1700	Reviewed By: Miled Jimble P.Eng.
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1500	
1400	
1300 0 5 10 15 20	25 30 35 40

Moisture Content - (%)

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Gradation Test Results
Shot Rock Cover

## **FBA** Engineering

			LAT	RGE AGGR	egate anai	YSIS REPO	RT			
	ongorda Was Turo Minesite	ate Rock Cont e, YT	. Fac.				?Station O			ide slope
Project Nur	nber: 0201-	-11365			,					
Date Sampl	led: 94/04/	/29 By	r BCF		Tim	et 1000		7	emp:	
-	ly. Construct						4/05/08			
							Content:			
				** ******************************						
			<del></del>					'		
Attention:	Mr. Bill Duni	n. P.Eng.			1					
A		RIED ROCK -	RIPRAP	****						
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Kemorks:		or exchange								
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		90				2	5 (1)			1 /
300 150 75	100.0 59.7 15.0	90				2	5 C2 Z3			1 /
300 150 75 50	100.0 59.7 15.0 12.2	90				7	5 (1)			1 /
300 150 75 50 20	100.0 59.7 15.0 12.2 7.8	90 80				2	13			1 /
300 150 75 50 20 12.5	100.0 59.7 15.0 12.2 7.8 6.6	90 80				2	12 5			1 /
300 150 75 50 20 12.5	100.D 59.7 15.0 12.2 7.8 6.6 5.7	90 80 70	······			2	13			1 /
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300 150 75 50 20 12.5 10 5 2 1.25 0.8 0.4 0.25 0.16	100.0 59.7 15.0 12.2 7.8 6.6 5.7 4.0 3.0 2.2 1.7	90 80 70 SIESSAI INDEAN 30 30 30 30 30 30 30 30 30 30 30 30 30	······			2	13			1 /
300 150 75 50 20 12.5 10 5 2 1.25 0.8 0.4 0.25	100.D 59.7 15.0 12.2 7.8 0.6 5.7 4.0 3.0 3.0 2.2 1.7 1.4	90 80 70 Shirsted Hedden 30 20	······			2	13			1 /
300 150 75 50 20 12.5 10 5 2 1.25 0.8 0.4 0.25 0.16	100.0 59.7 15.0 12.2 7.8 6.6 5.7 4.0 3.0 2.2 1.7	90 80 70 SNESSAU 11630234 40 30 10	······			2	13			1 /

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Density Test Results Channel Base Seal

#### ASTM Designation D2922 & D3017, or D1556

Project No.: 02	01-11365	Test Apparatus: _	Nuclear	Mach. N	lo.: <u>7866</u>		
Project: Vangorda Waste Dump Faro, YT		•					
Client: PELLY	CONSTRUCTION LTD.		Specified Compaction: 98.0				
111 I	ndustrial Road						
Whitehorse, YT							
		· · · · · · · · · · · · · · · · · · ·					
Y1A 2	<u> </u>	Maximum Dry De	nsity:20	20			
MR. B	ILL DUNN	Optimum M.C.: _					
			•				
Test No./	1	F11'	% Moisture	Dry Density	%		
Probe Depth	Location	Elevation	Content	Kg/m³	Compaction		
1 /300	0+240 - Base of Trench		11.7	1951	96.6		
2 /300	0+240 - Left Bank		11.7	1933	95.7		
3 /300	0+240 - Right Bank		11.2	1961	97.1		
4 /300	0+220 - Base of Trench		10.6	2062	102.0+		
5 /300	0+220 - Left Bank		10.9	2011	99.8		
6 /300	0+220 - Right Bank		10.6	2034	100.7		
7 /300	0+200 - Base of Trench		13.2	1948	96.4		
8 /300	0+200 - Left Bank		12.5	1946	96.3		
9 /300	0+200 - Right Bank		12.5	1977	97.9		
10 /300	0+180 - Base of Trench		10.4	1997	98.9		
11 /300	0+180 - Left Bank		11.3	1967	97.4		
12 /300	0+180 - Right Bank		10.9	2002	99.1		
13 /300	0+160 - Base of Trench		11.4	2007	99.4		
14 /300	0+160 - Left Bank		10.5	1995	98.8		
15 /300	0+160 - Right Bank		10.2	1992	98.6		
16 /300	0+140 - Base of Trench		11.6	1930	95.5		
Remarks:							
		<b>/</b> .	cc				
Reviewed By: _	Willed Mintel	P.Eng.	PELLY CO	NSTRUCTIO	N LTD.		
		`	FILE COP	<u>Y</u>			
	NTION: MR. BILL DUNN						
	Y CONSTRUCTION LTD.						
	Industrial Road		<del></del>				
	ehorse, YT						
Y1A	2T7 ·						

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15700

Project No.: 020	01-11365	Test Apparatus:	Nuclear	Mach. N	lo.: <u>7866</u>		
Project: Vangorda Waste Dump		Soil Description: SILT (TILL)- sandy, some					
·		gravel; some clay					
( MATTER F I					**		
		Temperature Ai	r:	_°C Soil:	°C		
Client: PELLY	CONSTRUCTION LTD.	Specified Compa	ction:9	8.0			
111 Industrial Road		Compaction Standard: Standard Proctor					
Whitehorse, YT							
	T7						
<u> </u>	ILL DUNN	Optimum M.C.: _	1	2.0			
		Date Tested:	94,04,27	Ву: <u>В</u>	CF		
				•			
Test No./ Probe Depth	Location	Elevation	% Moisture Content	Dry Density Kg/m³	% Compaction		
17 /300	0+140 - Left Bank		11.8	1929	95.5		
18 /300	0+140 - Right Bank		11.8	1963	97.2		
19 /300	0+100 - Base of Trench	-	0.0	1934	95.8		
20 /300	0+120 - Base of Trench		8.1	2019	99.9		
21 /300	0+120 - Left Bank		7.8	2017	99.8_		
22 /300	0+120 - Right Bank		8.9	2002	99.1		
23 /300	0+140 - Base of Trench		8.8	2010	99.5		
24 /300	0+140 - Left Bank		9.1	2021	100.0		
25 /300	0+160 - Base of Trench		10.2	2038	100.9		
26 /300	0+160 - Left Bank		9.9	2032	100.6		
27 /300	0+160 - Right Bank		9.8	2021	100.0		
28 /300	0+280 - Base of Trench		8.8	1990	98.5		
29 /300	0+280 - Left Bank		8.4	1992	98.6		
30 /300	0+300 - Base of Trench		9.2	1992	98.6		
31 /300	0+180 - Base of Trench		8.6	1941	96.1		
32 /300	0+200 - Rase of Trench		9,4	1936	95.8		
Remarks:							
	3						
Reviewed By:	Whater hint	P.Eng.	PELLY CO	NSTRUCTIO	N I Th		
1101.01104 By	10	1	FILE COP				
	NTION: MR. BILL DUNN						
	Y CONSTRUCTION LTD.						
	Industrial Road	***************************************					
	ehorse, YT						
Y1A	2T7						



Project No.: 02	01-11365	Test Apparatus:	Nuclear	Mach. N	No.: <u>7866</u>			
Project: Vangorda Waste Dump		Soil Description: SILT (TILL)- sandy, some						
Faro,	YT	·						
		Temperature Air: °C Soil: °C						
Client: PELLY	CONSTRUCTION LTB.	Specified Comp						
111 Industrial Road		Chamber of Chamber						
Whitehorse, YT								
	T7	Maximum Dry Density:						
	ILL DUNN							
	•							
		Date rested:		Бу				
Test No./ Probe Depth	Location	Elevation	% Moisture Content	Dry Density Kg/m³	% Compaction			
33 /300	0+220 - Base of Trench		8.0	1944	96.2			
34 /300	0+240 - Base of Trench		8.5	1977	97.9			
35 /300	0+260 - Base of Trench		9.5	1978	97.9			
	•			2412.0	= 98.2			
				35				
					average			
				,				
Remarks:								
	·							
	Males Minister Minister Minister Mr. BILL DUNN	P.Eng.	CCFELLY COFILE COP	NSTRUCTIO Y	N_LTD.			
	Y CONSTRUCTION LTD.							
	Industrial Road ehorse, YT			·				
Y1A								



Density Test Results
Till Cover

Project No.: 02	01-11365	Test Apparatus: <u>Nuclear</u> Mach. No.: 4004				
Project: Vangorda Waste Dump		Soil Description: SILT - gravelly, some sand.				
Faro,	YT	some clay				
		Temperature Air		_°C Soil:	°C	
Client: PELLY	CONSTRUCTION LTD.	Temperature Air: °C Soil: °C  Specified Compaction: 98.0  Compaction Standard: Standard Proctor				
111 I	ndustrial Road					
	horse, YT	Minimum Dry Density:				
Y1A 2		Maximum Dry De	-			
	ILL DUNN	Optimum M.C.: _				
		•				
		Date Tested:	74, VD, 1V	By: <u>fi</u>	.,r	
Test No./ Probe Depth	Location	Elevation	% Moisture Content	Dry Density Kg/m³	% Compaction	
36 /200	STA 0+160 - 10 m Below Crest	-0.45	10.9	2014	95.2	
37 /200	STA 0+190 - 10 m Below Crest	-0.45	11.2	2037	96.3	
38 /200	STA 0+210 - 10 m Below Crest	-0.45	11.0	2058	97.3	
39 /200	STA 0+205 - 30 m Below Crest	-0.45	11.4	1965	92.9	
40 /200 41 /200	STA 0+170 - 30 m Below Crest	-0.45	12.1	1980	93.6	
42 /200	STA 0+155 - 30 m Below Crest STA 0+165 - 70 m Below Crest	-0.45 -0.45	11.0	2032	96.1 98.2	
43 /200	STA 0+180 - 70 m Below Crest	-0.45	8.2	1888	89.3	
44 /200	STA 0+200 - 70 m Below Crest	-0.45	14.2	1951	92.2	
45 /200	STA 0+200 - 105 m Below Crest		10.1	2017	95.4	
46 /200	STA 0+185 - 100 m Below Crest		11.5	2025	95.7	
47 /200	STA 0+160 - 110 m Below Crest		11,4	1983	93.8	
Remarks:						
	9					
Reviewed By:	Whited mindle	P.Eng.		HSTRUCTIO	N LTD.	
ATTF	NTION: MR. BILL DUNN		FILE COP	Y		
	Y CONSTRUCTION LTD.					
	Industrial Road				——————————————————————————————————————	
	ehorse, YT					
Y1A					<b>1</b>	



Client: PELLY CONSTRUCTION LTD.  111 Industrial Road  Whitehorse, YT  Y1A 2T7  MR. BILL DUNN		Test Apparatus:  Soil Description:  Some  Temperature A  Specified Compa  Compaction Star  Minimum Dry De  Maximum Dry D  Optimum M.C.:  Date Tested:	SILT - gr clay  ir: action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:9 action:	ravelly,  °C Soil:  B.0  andard Pro  15	some sand,
***************************************		Date Fested:	74. VO. 13	ву:	<u>LF</u>
Test No./ Probe Depth	Location	Elevation	% Moisture Content	Dry Density Kg/m³	% Compaction
48 /200	STA 0+160 - 20 m Below Crest	-0.45	8.8	2073	98.0
	Retest From June 10				
49 /200	STA 0+180 - 20 m Below Crest	-0.45	9.0	2072	98.0
	Retest From June 10				
50 /200	STA 0+200 - 30 m Below Crest	-0.45	7.8	2089	98.8
por 3 + 201 55 m	Retest From June 10				-
51 /200	STA 0+190 - 60 m Below Crest	-0.45	9.1	2103	99.4
52 /200	Retest From June 10				
32 /200	STA 0+160 - 80 m Below Crest Retest From June 10	-0.45	8.3	2080	98.3
53 /200	STA 0+160 - 100 m Below Crest	t -0.45	9.6	2071	07.0
00 / 200	Retest From June 10	0 -0,40	7.0	2071	97.9
	The dead of the defined and				1
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Remarks:					
, 10111211101 <u></u>	ì				
	While Judle ENTION: MR. BILL DUNN	P.Eng.	cc FELLY CO FILE COP	NSTRUCTIO Y	N LTD.
	Y CONSTRUCTION LTD.		***		
	Industrial Road		-		
	ehorse, YT				
Y1A	217				



Project: Vango	01-11365 rda Waste Dump YT	•				
Client: FELLY CONSTRUCTION LTD.  111 Industrial Road  Whitehorse, YT		Temperature Air: 14.0 °C Soil: °C  Specified Compaction: 98.0  Compaction Standard: Standard Froctor  Minimum Dry Density:				
Test No./ Probe Depth	Location	Elevation	% Moisture Content	Dry Density Kg/m³	% Compaction	
54 /200 55 /200 56 /200 57 /200 58 /200 59 /200 60 /200 61 /200 62 /200 63 /200	0+180 - 40 m from Crest (Retest #54)  0+160 - 40 m from Crest  0+165 - 80 m from Crest  0+185 - 80 m from Crest  0+205 - 80 m from Crest (Retest #59)  0+180 - 110 m from Crest (Retest #61)  0+208 - 110 m from Crest	+1.1 +1.1 +1.1 +1.1 +1.1 +1.1 +1.1 +1.1	9.4 9.1 8.4 10.1 8.4 9.5 7.8 7.9 8.6 8.7	2021 2108 2073 2079 2104 1984 2083 2053 2137 2118	95.6 99.7 98.0 98.3 99.5 93.8 98.5 97.1 101.0 100.1	
PELL 111	Mailed multicontion: MR. BILL DUNN Y CONSTRUCTION LTD. Industrial Road ehorse, YT	P.Eng.	cc PELLY CO FILE COP	NSTRUCTIO Y	N LTD.	



Project No.: <u>02</u>	01-11365	Test Apparatus:	Nuclear	Mach. N	lo.: <u>7866</u>
Project: Vangorda Waste Dump		Soil Description: SILT (TILL)			
Faro,		Con Decemption,			
		Temperature Ai	г:	°C Soil:	°C
111 Industrial Road Whitehorse, YT		Specified Compa	ction:9	5.0	
		Specified Compaction: 95.0  Compaction Standard: Standard Proctor			
		Minimum Dry De	-		
<u> </u>	T7	Maximum Dry De	ensity:21	15	
<u> </u>	ILL DUNN	Optimum M.C.: _		9.0	
		Date Tested:	94.06.24	Ву:В	CF
Test No./	Location	Elevation	% Moisture	Dry Density	%
Probe Depth			Content	Kg/m ³	Compaction
64 /250 65 /200	STA 0+200 - 25 m From Crest STA 0+175 - 25 m From Crest	-0.3	8.8	2048	96.8
66 /200	STA 0+173 - 25 m From Crest	-0.3	9.1	2010	95.0 94.9
67 /250	STA 0+190 - 40 m From Crest	-0.3	9.8	2122	100.3
68 /250	STA 0+170 - 45 m From Crest	-0.3	8.6	2108	99.7
69 /250	STA 0+155 - 45 m From Crest	-0.3	9.2	2109	99.7
70 /250	STA 0+160 - 30 m From Crest	-0.3	9.5	2103	99.4
71 /250	STA 0+180 - 80 m From Crest	-0.3	9.8	2122	100.3
72 /250	STA 0+200 - 80 m From Crest	-0.3	7.0	2137	101.0
73 /250	STA 0+190 - 110 m From Crest	-0.3	8.6	2073	98.0
74 /250	STA 0+170 - 110 m From Crest	-0.3	8.4	2106	99.6
75 /250	STA 0+155 - 110 m From Crest	-0.3	8.9	2102	99.4
Remarks:					
Reviewed By: _	Micher pro-6	P.Eng.	PELLY CO	NSTRUCTIO Y	IN LTD.
	ENTÍON: MR. BILL DUNN				
	Y CONSTRUCTION LTD.				
	Industrial Road				
	ehorse, YT	***************************************			
YIA	217				



## **DENSITY TEST RESULTS**

## ASTM Designation D2922 & D3017, or D1556

Faro, YT  Temperature Air:oC Soil:oc Specified Compaction:95_0  111 Industrial Road	Project No.: 0201-11365  Project: Vangorda Waste Dump					
Temperature Air:						
Temperature Air:	Faro.	ΥT				
111   Industrial Road   Compaction Standard:   Standard Proctor			Temperature A	ir:	_°C Soil:	°C
Whitehorse, YT	Client: PELLY CONSTRUCTION LTD.		Specified Compaction: 95.0			
Whitehorse, YT	111 Industrial Road		•			
Maximum Dry Density:   2115						
Date Tested: 94.06.28   By: BCF	•		,			
Date Tested: 94.06.28   By: BCF	<u>Y1A. 2T7</u>					
Date Tested: 94.06.28   By: BCF	MR. BILL DUNN		Optimum M.C.: 9.0			
Test No./   Compaction						
Probe Depth			Dato 100toa			
T7 /250		Location	Elevation			% Compaction
T8 / 250	76 /250	STA 0+195 - 10 m Below Crest	Grade	10.3	2022	95.6
Reviewed By:	77 /250		<u>Grade</u>	8.9	2068	97.8
80 /250	78 /250	STA 0+175 - 70 m Below Crest	Grade	9.6	2140	101.2
81 /250	79 /250	STA 0+163 - 95 m Below Crest	Grade	9.7	2023	95.7
82 /250	80 /250	STA 0+155 - 115 m Below Crest	t Grade	11.1	2062	97.5
### Reviewed By:  ### ATTENTION: MR. BILL DUNN PELLY CONSTRUCTION LTD.  ### 111 Industrial Road Whitehorse, YT  ### 150 STA 0+199 - 60 m Below Crest	81 /250	STA 0+175 - 115 m Below Crest	Grade	10.1	2079	98.3
Reviewed By:	82 /250	STA 0+195 - 100 m Below Crest	t Grade	10.4	2058	97.3
Reviewed By:  ATTENTION: MR. BILL DUNN PELLY CONSTRUCTION LTD.  111 Industrial Road Whitehorse, YT  ATTENTION: MR. BILL DUNN PELLY CONSTRUCTION LTD.	83 /250	STA 0+199 - 60 m Below Crest	Grade	9.7	2139	101.1
Reviewed By:  Attention: MR. Bill DUNN  PELLY CONSTRUCTION LTD.  111 Industrial Road  Whitehorse, YT	84 /250		Grade		2047	96.8
Reviewed By:  ATTENTION: MR. BILL DUNN  PELLY CONSTRUCTION LTD.  111 Industrial Road  Whitehorse, YT	85 /250	STA 0+157 - 15 m Below Crest	Grade	9.5	2102	99.4
Reviewed By:  ATTENTION: MR. BILL DUNN  PELLY CONSTRUCTION LTD.  111 Industrial Road  Whitehorse, YT			,			
Reviewed By:  ATTENTION: MR. BILL DUNN  PELLY CONSTRUCTION LTD.  111 Industrial Road  Whitehorse, YT						
Reviewed By:  ATTENTION: MR. BILL DUNN  PELLY CONSTRUCTION LTD.  111 Industrial Road  Whitehorse, YT						
Reviewed By:    Construction Ltd.   File Copy	Remarks:					
Reviewed By:    Construction Ltd.   File Copy						
Reviewed By:    Construction Ltd.   File Copy	- Want					
Reviewed By:    Construction Ltd.   File Copy						
FILE COPY ATTENTION: MR. BILL DUNN PELLY CONSTRUCTION LTD. 111 Industrial Road Whitehorse, YT		White of by A	6		UCTEULCTTO	ti i rr
ATTENTION: MR. BILL DUNN PELLY CONSTRUCTION LTD. 111 Industrial Road Whitehorse, YT	Reviewed By: _	There and Iston	P.Eng.			N L.III.
PELLY CONSTRUCTION LTD. 111 Industrial Road Whitehorse, YT	ΔΤΥΕ	NTTON ME RILL TUNN		FILE COP	1	
111 Industrial Road Whitehorse, YT						
Whitehorse, YT						
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APPENDIX C

Photographs



**Photo C-1** Excavation of snow from existing drainage ditch at STA 0+900.



**Photo C-2** Snow clearing from area above proposed channel and snow removal from existing channel.



Photo C-3 Backfilling of existing ditch with spoil from original stockpile (STA 0+900).



Photo C-4 Recontoured area after existing ditch was backfilled (STA 0+800 to 1+000).



**Photo C-5** Snow clearance along proposed channel alignment from STA 0+100 to 0+700.



Photo C-6 Snow removal from existing ditch on the north side of the Vangorda Waste Dump from STA 1+000 to 1+200.



Photo C-7 Excavation of existing bedrock at STA 0+140.



**Photo C-8** Shaping of channel on north side of waste pile from STA 1+260 to 1+000.



**Photo C-9** Final grade in excavation of channel from STA 0+300 to 0+600 prior to riprap placement.

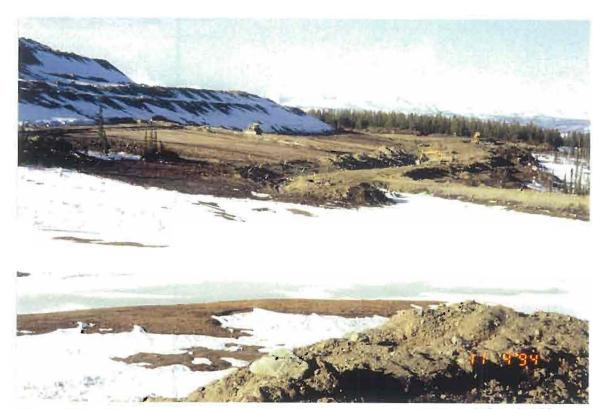


Photo C-10 Riprap placement along end section of channel from STA 1+360 to 1+100.



Photo C-11 Riprap placement along channel section (STA 1+200).

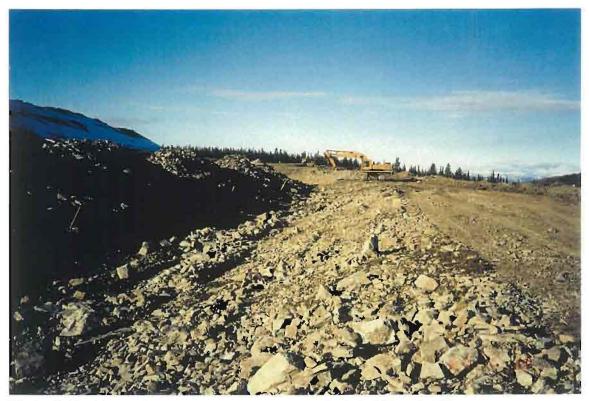


Photo C-12 Riprap placement along channel from STA 1+300 to 1+100.



Photo C-13 View looking south over the waste pile. Vangorda Pit is shown in the left hand corner with Little Creek Pond and Dam in the foreground. Riprap placement is in progress in the channel on the north side of the pile.



Photo C-14 View north of the waste rock pile and the channel under construction.



Photo C-15 Borrow area for riprap.



Photo C-16 Riprap borrow pit.



Photo C-17 Excavation to final grade of the channel on the north side of the waste pile.



Photo C-18 Removal of peat zones on the west bank of the channel at STA 0+900.



**Photo C-19** Completed section of the channel with riprap protection (STA 1+340 to 1+100).



Photo C-20 Compaction of glacial fill seal along bottom of channel from STA 0+220 to 0+100.



**Photo C-21** Compaction of initial lift of fill to seal bedrock at bottom of channel. (STA 0+100 to 0+150).



Photo C-22 Glacial till seal over bedrock from STA 0+100 to 0+220.



**Photo C-23** Over excavation of frozen organic soil on the east side of channel from STA 0+880 to 0+920.



Photo C-24 Over excavation of unsuitable material along east side of channel from STA 0+880 to 0+920.



**Photo C-25** Channel excavation to final grade along southern leg of channel from STA 0+430.



Photo C-26 Channel excavation to final grade at STA 0+900.



Photo C-27 Shotrock stockpiled on south side of channel prior to placement at STA 0+400.



Photo C-28 Typical shotrock protection at STA 0+830.



Photo C-29 Aerial view of completed channel along the north side of the pile (STA 1+100 to 1+350). Little Creek seepage collection pond is shown in the background.



Photo C-30 Riprap placement in channel at western end of pile from STA 0+800 to 1+000.



Photo C-31 Completed channel from station 1+200 to outlet into Little Creek Pond.



Photo C-32 Completed channel at STA 0+900.



Photo C-33 Aerial view of south side of the waste rock pile. Riprap protection of channel section from 0+100 to 0+600 is in progress. Resloping of rock pile from STA 0+170 to 0+220 is seen in top left hand corner.



Photo C-34 Ground view of the channel section shown in Photo C-27.



Photo C-35 View of the north side of the waste pile and the channel with Little Creek Pond in the middleground and Vangorda Pit in the foreground.



Photo C-36 View looking north of the channel and the waste rock pile.



Photo C-37 Groundwater well. GW-94-03 with bailer.



Photo C-38 View looking south from GW-94-03 of completed channel.



**Photo C-39** Groundwater well GW-94-05. Water inside protective cap spills over lip as a result of artesian conditions.



Photo C-40 Completed channel along STA 0+150 to 0+700.



Photo C-41 V-noted weir at fingerdrain No. 3.



**Photo R-1** Resloping of waste rock pile from STA 0+170 to 0+220.



Photo R-2 D-10 resloping waste on south side of pile.



Photo R-3 Resloping of waste pile looking down.



Photo R-4 Resloping slopes on Vangorda waste rock pile looking up.



Photo R-5 View looking north of fill placement over recontoured area of waste rock pile.



Photo R-6 Initial lift of the fill cover placed over recontoured rock.