DE BEERS
A DIAMOND IS FOREVER

PROVINCIAL RECORDING
OFFICE - SUDBURY
RECEIVED
AUG 0 1 2000
A.M. 10 P.M.
7 8 9 10 11 12 1 2 3 4 5 6

43B13SW2005 2.20497 527834 010

Victor 2000 Project

Preliminary Geotechnical Report

2.20497

Contributions

David Eichenberg

Deirdre O'Donohoe

RECEIVED
10:35am.
AUG 0 1 2000
GEOSCIENCE ASSESSMENT
OFFICE

INTRODUCTION **2**

Geological Setting **4**

1.1 Hudson Bay Platform 4

1.3.1 Structural Geology 4

1.2 Victor Kimberlite C Local Host Rock Geology 3

1.3.2 Lithostratigraphy 3

1.3.3 Precambrian Basement 3

1.3.4 Ordovician Formations 4

1.3.5 Silurian Formations 6

1.3.6 Quaternary Geology 7

1.3 Geotechnical Programme 9

Geotechnical Units **10**

1.4 Afm (Attawapiskat Formation) 11

1.5 EK/SR (Ekwan and Severn River Formations) 12

1.6 RH/CR (Red Head Rapids Fm and Churchill River Gp) 13

1.7 BCR (Bad Cache Rapids Group C Upper Formation) 14

1.8 BCR-SS (Bad Cache Rapids Group C Lower Formation) 15

1.9 Ga/Gn (Precambrian Basement) 15

Geotechnical Issues **17**

43B13SW2005 2.20497 527834 010C

INTRODUCTION

A drill programme consisting of five geotechnical diamond drill holes and one delineation diamond drill hole was completed between the 28th of January and the 10th of March, 2000. HQ3 (61mm) and HQ (63.5mm) size core was recovered using a Boart Longyear, LF-70 drill rig. Core orientation and geotechnical data were recovered from each hole. Geotechnical units were identified based on geological boundaries, fracture frequency, rock strength, and joint conditions. Rock mass ratings and rock mass strengths for each unit were calculated.

Victor Kimberlite

The Victor kimberlite is located in the James Bay Lowlands approximately 100km west of the community of Attawapiskat (Figure 1). Two kimberlite bodies, Victor Main and Victor Southwest, were delineated from 1989 to 1999 using air and ground magnetic surveys as well as two delineation drill campaigns. Both kimberlites are classed as pyroclastic having formed and filled craters.

Figure 1 Location of the Victor kimberlite in Ontario, Canada.

Victor Main is the larger of the two bodies and may consist of up to three separate crater events. Approximate surface dimensions are 575m north-south by 300m east-west. This kimberlite has been broken into three our areas based on kimberlite textures and grade (Figure 2). Victor Main remains the highest-grade area of the kimberlite and the most likely to form a mine.

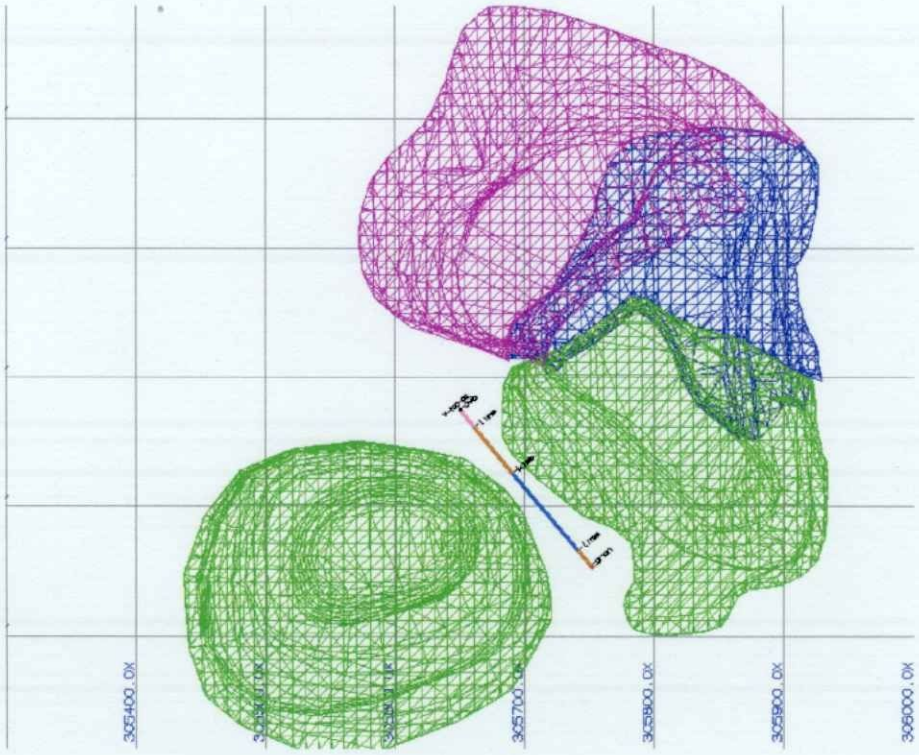


Figure 2: Major kimberlite areas of Victor main And Victor SW

Victor Southwest is located to the southwest side of Victor Main. It appears to be separated by a poorly delineated section of insitu country rock. Approximate surface dimensions of the Victor SW body are 225m north- south by 250m east-west (Figure 2).

Drilling campaigns have identified similar pyroclastic kimberlite in both Victor Main and Victor SW. The kimberlite is relatively competent and has undergone very little weathering.

The host rock around the kimberlites consists of the lower sedimentary sequences of the Moose River Basin. This Ordovician aged basin began forming ~450Ma. Its thickness at the time of kimberlite intrusion is estimated at 600m. Presently sedimentary formations of Ordovician and Silurian age are 270-275m thick locally around the Victor kimberlites. The sediments rest nonconformably on the Precambrian basement granitoids (See Stratigraphic Sections Appendix2).

GEOLOGICAL SETTING

1.1 HUDSON BAY PLATFORM

Kimberlites discovered by Monopros Limited, lie within the James Bay lowlands of the Hudson Platform. The platform is a vast low, flat coastal plain 160 to 420 km wide and extends 1350 km along Hudson and James Bay (Norris, 1993). Relief in the area consists of a low gentle gradient trending east-southeast towards James Bay.

The Geology of the Hudson Platform consists of Paleozoic rocks overlying Archean and Proterozoic terrain. Paleozoic rocks are the erosional remnants of a much more expansive cratonic cover that included Lower Paleozoic platform type areas in both the north and south (Grant & Sanford, 1998). Two Large Phanerozoic sedimentary basins are divided by a northeast trending Transcontinental Arch (formerly the Cape Henrietta Maria Arch). The Hudson Bay Basin is found to the north of this arch and the Moose River Basin lies to the south with the Victor kimberlite located on the southern flank of the arch (Figure 3).

The platform was first covered by marine sediments when the Tippecanoe Sea began transgressing over the Canadian Shield (~450Ma). Deposition of sediments continued until Late Ordovician time (~438Ma) when a minor sea regression caused a period of aerial erosion. By Early Silurian time two areas with active deposition and still inundated by water, underwent subsidence. Simultaneous uplift of the central Transcontinental Arch also occurred at this time (Norris, 1986).

Kimberlite intrusions between 155 and 180 Ma through the Transcontinental Arch met ~600m of pre-basin sediments. Since that time approximately 300m has been eroded away (Figure 4).

1.3.1 Structural Geology

On the large scale, the Hudson and James Bay Lowlands are intersected by a northeast and northwest KorthogonalL arch system. Uplift of these arches developed during the end of the Early Silurian period. The Attawapiskat region is bound by the Severn and Boothia Arch in the east and west, and by the Transcontinental (Cape Henrietta Maria arch) and Fraserdale Arches in the north and south respectively. This arch development allowed clastic and evaporite deposits to occur in the sub-basins (Sanford & Grant, 1990) (Figure 5).

Since deglaciation of the Kewatin ice sheet roughly 8000 years ago, the Hudson region has experienced 180m of isostatic rebound. At times, this rate of uplift is thought to have reached 7cm/year. Presently the basin rises at 1cm/year or

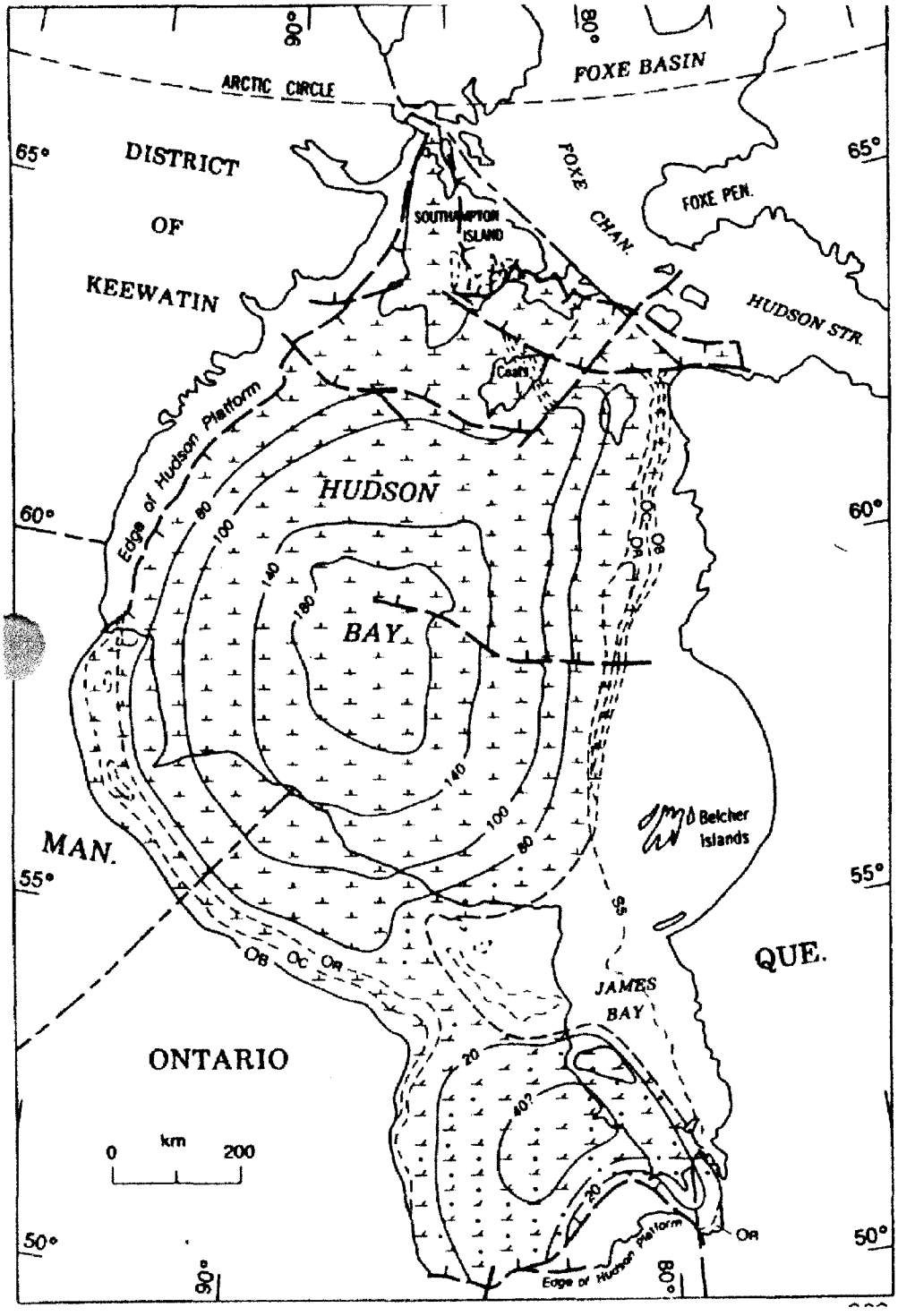


Figure 3 : Ordovician deposits of the Hudson Bay Platform

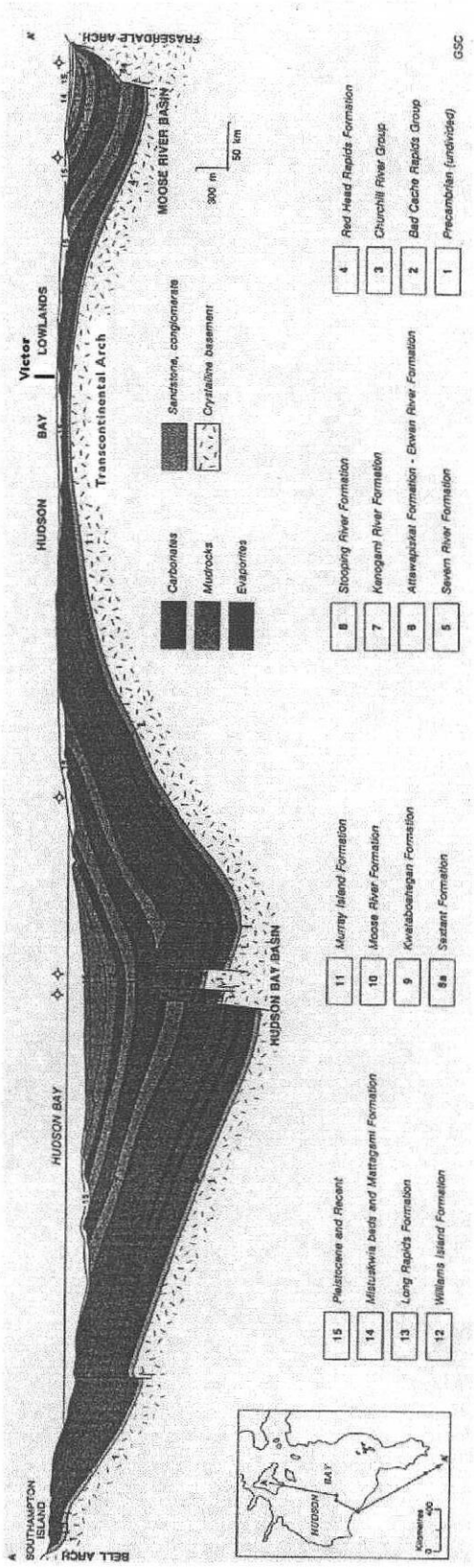


Figure 4: The Hudson Bay Platform and the relative location of the Victor kimberlite

1m/century. The quick rebound of the crust in this area has caused the reactivation of many basin faults.

Transecting the Attawapiskat area is a set of minor northwest-southeast and northeast-southwest striking faults, with the Winisk River Fault system creating a major structure in the Hudson Bay Lowlands.

Two sets of dykes (inferred from magnetic data by Kong, Boucher & Scott Smith, 1998) strike northwest-southwest and north-south through the Attawapiskat area and possibly belong to the Mackenzie dyke swarm and Matchewan/Hearst dykes.

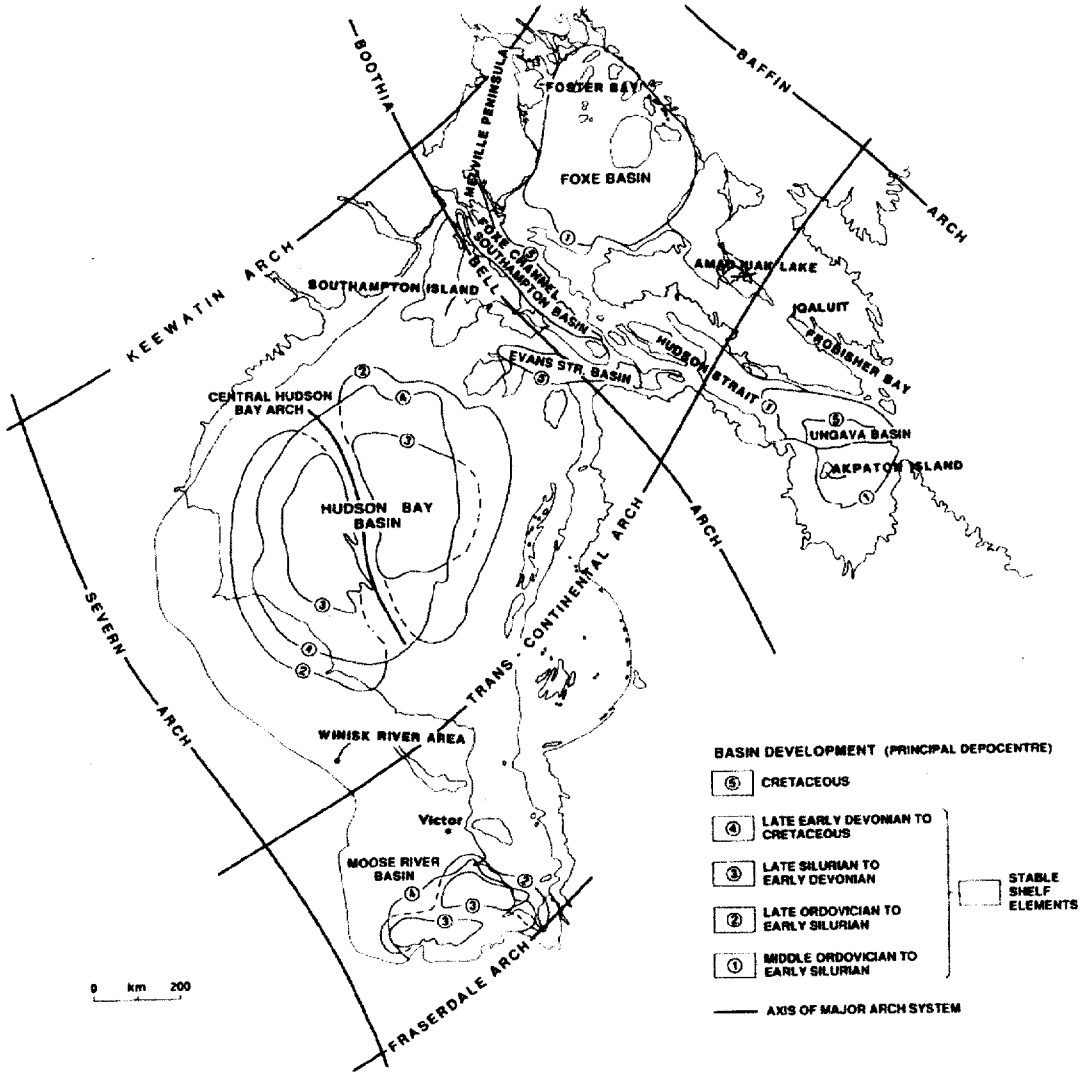


Figure 5: Tectonic elements of the Hudson Platform (Sanford et al 1990)

1.2 VICTOR KIMBERLITE – LOCAL HOST ROCK GEOLOGY

The Victor Kimberlite is found on the southwest flank of the Transcontinental Arch, located between the Hudson Bay Basin and the Moose River Basin, (Figure 4). The sedimentary cover is not part of either of the basins, but is part of the outlying pre-basin sediments.

Directly overlying the Precambrian granitoid and gneiss basement, are three units of later Middle Ordovician to Late Ordovician time. The units include the basal Bad Cache Rapids Group, which is overlain by the Churchill River Group and Red Head Rapids Formation. The upper surface of the Red Head Rapids Formation is disconformablely overlain by Silurian sediments of the Severn River Formation and Ekwan River Formation. This disconformity represents the 438 Ma Ordovician-Silurian boundary. Both the Ekwan and Severn River Formations represent open marine environments.

The Attawapiskat Formation outcrops locally around the Victor kimberlite and represents reef and inter-reef limestones conformably overlying the Ekwan River Formation.

1.3.2 Lithostratigraphy

The country rock surrounding the Victor kimberlite overlie the Transcontinental Arch, includes numerous sequences and various types of limestone, dolostone, shale and sandstone. Local orientation of the bedding is flat lying however, it has been observed that the bedding in the Attawapiskat Formation can dip up to 30° in areas adjacent to reef complexes.

1.3.3 Precambrian Basement

The Precambrian basement rocks are defined as a quartz-biotite, feldspathic gneiss of the Superior Province. Immediately above the solid cratonic basement is a zone of altered granite. This zone, depending on extent of the weathering can be observed as a discoloration (deep red-orange colour) to vuggy plucked granite or it is represented by very coarse sandstone due to selective weathering of the minerals. More often than not, all of these characteristics are noted in single drill hole. The zone between altered granitoid of the basement rocks and the Ordovician aged sediments is marked by a major 450 Ma nonconformity (Figure 6).

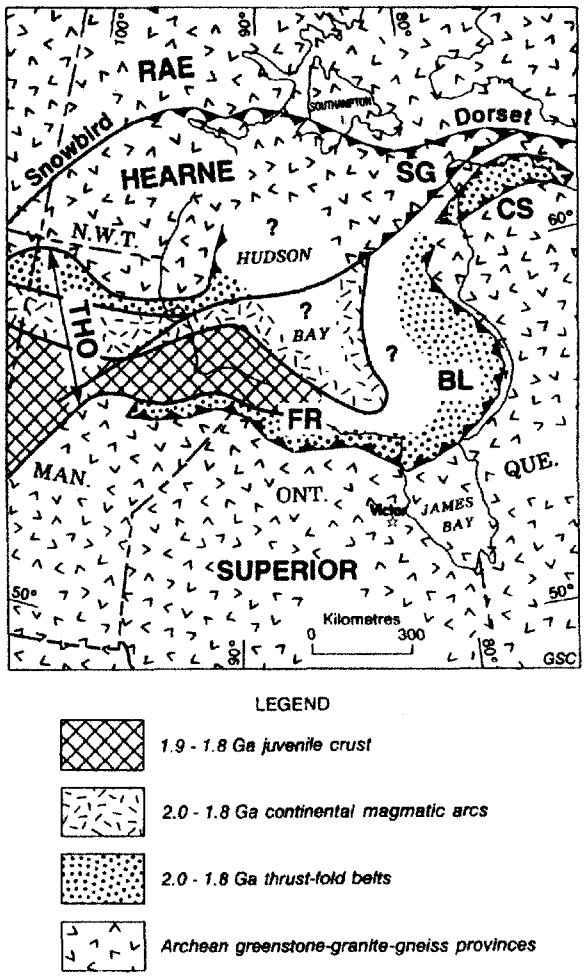


Figure 6: Basement Structure beneath the Hudson Platform

1.3.4 Ordovician Formations

Representing the early stages of basin formation, Ordovician Groups and Formations, lie nonconformably on the peneplained surface of the Precambrian basement. The Ordovician sediments represent numerous transgressive and restricted marine environments in the pre-subsidence history of the basins.

1. Bad Cache Rapids Group

Sediments of the Bad Cache Rapids Group are Mid-Ordovician in age, and represent the first marine transgression over the North American craton. This group is comprised of two distinct formations and are representative of a normal sub-tidal to intertidal marine environment. The lower member, Portage Chute Formation, is well-sorted and friable basal calcareous quartz sandstone that nonconformably overlies the Precambrian Basement. The second formation of the Bad Cache Rapids Group is the Surprise Creek Formation lying conformably

over the Portage Chute Formation. This formation is a finely crystalline, grey dolostone with abundant trace fossils and fine, black shale partings.

2. Boas River Formation

A thin, petroliferous black shale known as the Boas River Formation is found sporadically throughout the Hudson and James Bay platforms. This remnant of a formation is thought to be part of the Bad Cache Rapids Group. An erosional hiatus between Mid and Late Ordovician is the likely cause of its uneven distribution. Continual sea inundation of the land allowed for the deep-water marine depositional environment.

Figure 7 : 5-7 cm bed of petroliferous shale C Boas River Shale

3. Churchill River Group and Red Head Rapids Formation

Disconformably overlying the Bad Cache Rapids Group are the mixed sediments of a second transgressive sequence, the Churchill River Group. This Group is comprised of a series of minor transgressive and regressive-type subsequences. At the base of the Group are beds of well-sorted sandstone alternating with limestone. As the transgression experienced slight dissipation, some areas of deposition experienced a minor regressive period. The depositional environment of these sediments then became restricted, and deposited a locally continuous unit of finely bedded light grey mudstone, and evaporite.

The common strength characteristics and the relatively small vertical extent of the Churchill River Group and the overlying Red Head Rapids Formation allowed these two units to be grouped together for geotechnical purposes.

Within Churchill River Group and Red Head Rapids Formation are three distinct Fe-rich packstone units. These deposits represent the minor transgressive to regressive periods of deposition. Grading of sediments as well as minor units of mudstone breccia were observed. The mudstone/packstone units are linked with

the Churchill River Group, while dolomitic, calcareous limestones are descriptive of the upper Red Head Rapids Formation.

1.3.5 Silurian Formations

Marking the 438 Ma Ordovician-Silurian boundary, is a sharp disconformable contact between the Red Head Rapids mudstone and fossiliferous, mottled limestone of the Severn River Formation. Three Silurian aged formations make up the remainder of the country rock of the area. The Severn River Formation, Ekwan River Formation, and the Attawapiskat Formation represent reef to near reef depositional environments.

4. Severn River Formation and Ekwan River Formation

The first Silurian rocks of the Hudson Platform above the Ordovician-Silurian contact are those of the Severn River Formation. The limestone that overlies the unconformity is ~ 10m thick and is comprised of a fossiliferous mottled limestone. Sedimentary rocks of the Severn River and overlying Ekwan River Formations are represented by fine grained, thinly bedded limestones that alternate with 3-6m beds of mottled, cherty and fossiliferous limestone. Dolostone is rare occurring as thin 1-1.5m beds.

Both the Severn and Ekwan Formations were deposited in shallow sub-tidal zones of an open marine environment. The Ekwan River Formation is similarly a laminated, mottled limestone unit, and contains fossil, nodular chert, and areas of micro-karst limestone.

With respect to geotechnical issues, the Severn River Formation has been linked with the overlying Ekwan River Formation due to its close resemblance in sediment rock types and therefore common strength characteristics.

5. Attawapiskat Formation

An important structural and lithological feature of the Attawapiskat Formation is that it is a partially circumferencing, reef structure of both the Hudson Bay and Moose River Basins. The Attawapiskat Formation is the last of the Phanerozoic host rocks in the Attawapiskat River area. These represent an open marine, sub-tidal depositional environment of mid-Silurian age.

Reef complexes of the Attawapiskat Formation outcrop along the Attawapiskat River. These features are tens of metres wide and up to 10 metres in height. The Attawapiskat Formation is actually made up of two lithofacies of reef and inter-reef deposits (Norris, 1993). The Inter-reef deposits are made up of uniform beds of mudstone and dolomitic limestone that flank and overlie the reefs. The reef or bioherm units however, are abundant in large fossils and reef

building calcareous algae, corals and stromatolites. Calcite filled karsts, pinpoint porosity, as well as nodular chert are also abundant in the limestone.

1.3.6 Quaternary Geology

Overburden in the James Bay Lowlands predominantly consists of Pleistocene till sheets overlain by thin marine Holocene deposits (Kong, Boucher, Scott Smith, 1998). The till sheets were deposited by the glaciers flowing north to south with a northeast to southwest flow direction in the eastern part of the area, (Martini, 1998, in Kong, Boucher & Scott Smith, 1998).

The thickness of the Quaternary sediments is commonly between 30 and 60 m (Karrow, 1989 in Barnett, 1992). In the area of the Victor Kimberlite, the maximum thickness of overburden drilled was 64m, north of the lobes. This thickness is found to decrease to 14.6m in a southerly direction over the kimberlite. Thickness over the kimberlites themselves, however, is at its minimum (Figure 16 and 17).

Figure 8: A 4m section of organics and overburden above Victor SW

Figure 9 : Victor Main Trench with exposed kimberlite

In 1998, a more descriptive log of the Quaternary sediments was recorded due to availability of visible sections in a trench over Victor Main. Observations showed that immediately above the kimberlite body is a thin (~3.5m), basal till deposited during the last glaciation in the area. This grey-brown unit is clay rich, with a low to moderate clast content of subrounded to subangular pebbles and cobbles. Absence of structures and high compaction, prove the till to be that of a true basal till. The matrix consists of very fine clay and silt, with some minor fine, grained sand. Clast composition is made up of both proximal limestone and chert clasts, while distal clasts include granitic and mafic source rocks. (Plouffe & McCrae, 1999)

Overlying the basal till layer are marine clays deposited as the Tyrell Sea inundated the land during deglaciation. Between these to Quaternary units, however, is a thin (~5cm), poorly defined mixed contact zone. This area is rich in small pebbles and fossil debris.

The last unit of the Quaternary period sediments prior to surficial organics is a unit of marine sediments. The marine clays contain two sub-units of slightly different lithologies. The sub-unit lying directly over the till and mixed zone consists of a clay and silt rich deposit. Dropstones of pebble size , shell debris,

and fine laminations are descriptive of this unit. Above the clay unit is the second sub-unit consisting of light brown fine grained, well-sorted sand. Fluvial features such as ripples, laminations, storm related lag deposits and fining upward sequences are found in this section.

1.3 GEOTECHNICAL PROGRAMME

Previous Victor drill campaigns, concentrated on delineation of the kimberlites and recovered only a small glimpse of the sedimentary strata of the host rock. The majority of host rock intersections did not extend outside what has developed into a substantial pre-contact zone of broken sediments. Due to the lack of country rock data, this geotechnical programme was designed to capture a broad range of information, thereby filling many of the gaps in the geological, geotechnical and hydrogeological database.

All drill holes of the 2000 program, were drilled into the sedimentary formations surrounding the Victor kimberlites to a depth intersecting the Precambrian basement. Two holes, V-100-00 and V-111-00 (planed as a delineation hole) intercepted substantial amounts of kimberlite. Geotechnical and hydrogeological data was recovered from each hole.

- Drill hole V-97-00 was a vertical hole drilled north-northwest of Victor Main. This hole was designed to recover a representative section of the sedimentary sequence that could be compared with each of the other holes in the programme. This hole was drilled down to the Precambrian basement. Packer permeability testing of this hole was completed.

- Drill hole V-98-00 was designed to test the northwest side of the two kimberlites. Structural, geotechnical and hydrogeological data were recovered.

- Drill hole V-99-00 was designed to test the southern host rocks. Structural, geotechnical and hydrological data were recovered.

- Drill hole V-100-00 was planned to test a poorly delineated section of sedimentary material between the kimberlite craters. A substantial section of kimberlite that is thought to be part of Victor Southwest was intercepted. Structural and geological data was recovered from insitu sedimentary units resting above and below the kimberlite.

- Drill hole V-101-00 evaluated the pre-contact and contact sedimentary rock adjacent to the kimberlite. The kimberlite contact zone was solid and formed a sharp contact with the initial sedimentary unit. However on the country rock side of the contact a wide zone of highly broken sediments was intercepted. This zone stretches out form the body ~15-45m and has become a prominent geotechnical mining issue.

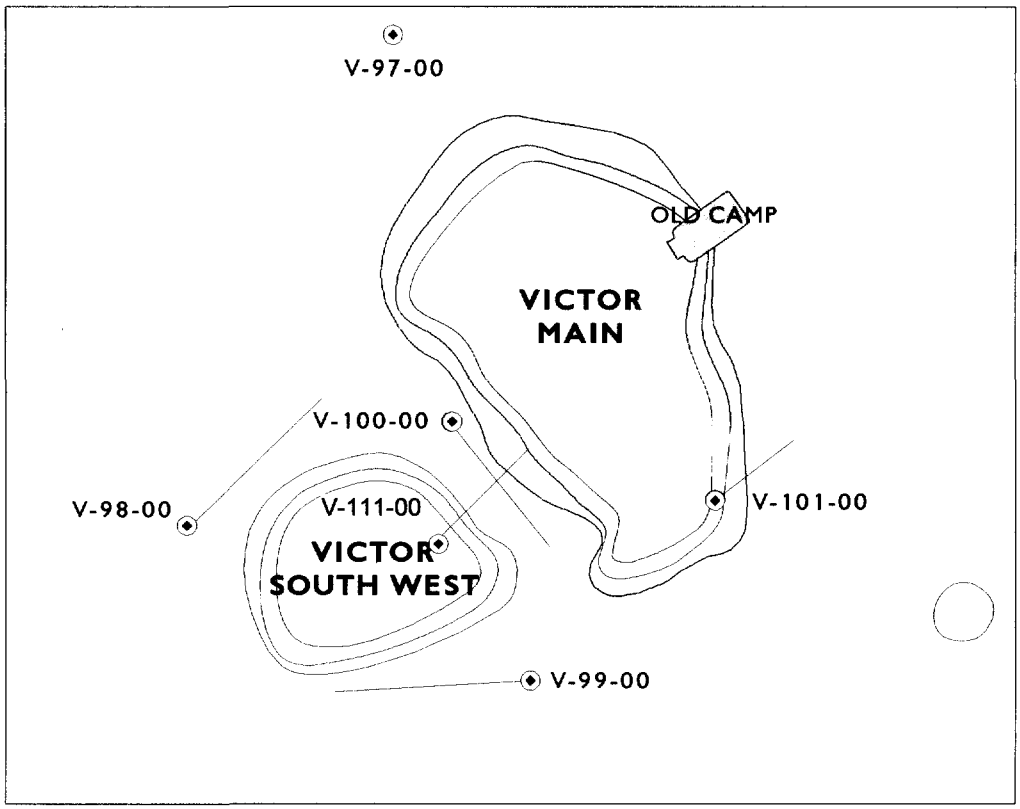


Figure 10: Geotechnical Drill Hole Locations

- V-111-00 was a delineation hole added to the programme to reevaluate the region between the kimberlites and attempt to assess the potential of finding sedimentary sequences. Insitu sedimentary units were intercepted at about 220m vertical depth.

- One thermistor string and two piezometer strings were successfully installed. One thermistor string was lost during installation.

GEOTECHNICAL UNITS

Geotechnical logging was completed for each of the five drilled holes. The accomplished primary objectives of the programme are as follows:

- A baseline stratigraphy was identified and correlated throughout all drill holes. Geotechnical logging of core from past drilling campaigns has been correlated to the known stratigraphy.

- Sedimentary units were determined to be flat lying and of consistent thickness locally around the Victor kimberlites.

Formation/ Group Name	Age	Vertical Depth	Vertical thickness
Attawapiskat Fm	Silurian	15 C 135m	71 - 119m
Ekwan/Severn River Fm	Silurian	135 C 220m	85 - 88m
Red Head Rapids Fm Churchill River Gp	Ordovician	220 C 261m	40 - 43m
Bad Cache Rapids Gp	Ordovician	261 C 270m	11m
Bad Cache Rapids Gp Sandstone	Ordovician	270 C 273m	2 C3m
Altered Granitoid	Precambrian	273 - 274	1m
Granite	Precambrian	274+	Basement

Table 1 : Geological Formations and Groups - Local thickness

1.4 AFM (ATTAWAPISKAT FORMATION)

AFM - A geotechnical unit corresponding to the Attawapiskat Formation, which outcrops throughout the area. This flat lying unit has a Formation thickness of 71m to 119m and a common base at approximately 135m vertically. This unit is comprised of relatively massive mottled limestone. Micro-karst features occur where fossils become abundant.

The intact rock strength is typically 47 to 60 Mpa and was measured up to 120 Mpa. RQD within this unit is high averaging between 81-97%. Overall joints are rare and sub-vertical. Joint conditions are good. Small-scale surface conditions are stepped rough to undulating rough.

Locally flat lying around the Victor kimberlite, bedding surfaces have undulating rough surface conditions. The bedding strength is relatively strong, however disjointed bedding planes were observed (Figure 7). This unit showed little to no susceptibility to weathering.

Figure 11 : Attawapiskat Formation C Mottled Limestone

Figure 12 : Disjointed bedding plains

1.5 EK/SR (EKWAN AND SEVERN RIVER FORMATIONS)

EK/SR C A moderately strong geotechnical unit that correlates with the Ekwan River Fm and Severn River Fm. Locally around the Victor Kimberlites these formations have flat lying bedding planes. The EK/SR unit is comprised of alternating beds of dominantly finely laminated limestone, mudstone, mottled limestone and rare dolomite. Micro-karst and karst sections are more common and are typically associated with areas of water movement.

Figure 13: EK/SR unit C Alternating beds of various limestone types

RQD of this unit is high ranging from 80% to 93%. The intact rock strength is typically 40 Mpa for finely laminated limestone, 40-70Mpa for mottled limestone, and up to 170 Mpa for dolostone. Rock strengths vary from 40 C70 Mpa in mottled limestone to >40 Mpa in micro-karst and finely laminated limestone.

The overall joint conditions are good. Joints are spaced 1-3m and are sub-vertical with small-scale surface conditions of step rough to step smooth. The EK/SR unit has a fair strength with RMR of 42 to 58 and RMS of 14 to 20.

1.6 RH/CR (RED HEAD RAPIDS FM AND CHURCHILL RIVER GP)

RH/CR C A weak geotechnical unit that correlates with the Red Head Rapids Gp and the Churchill River Gp. Locally around the Victor kimberlites these beds are flat lying and are comprised of weakly consolidated mudstones, sandstones, limestones, and strong dolomites. Mudstone makes up approximately 50-60 percent of these units and in areas is finely bedded with occurrences of evaporite. The mudstone units are highly susceptible to weathering.

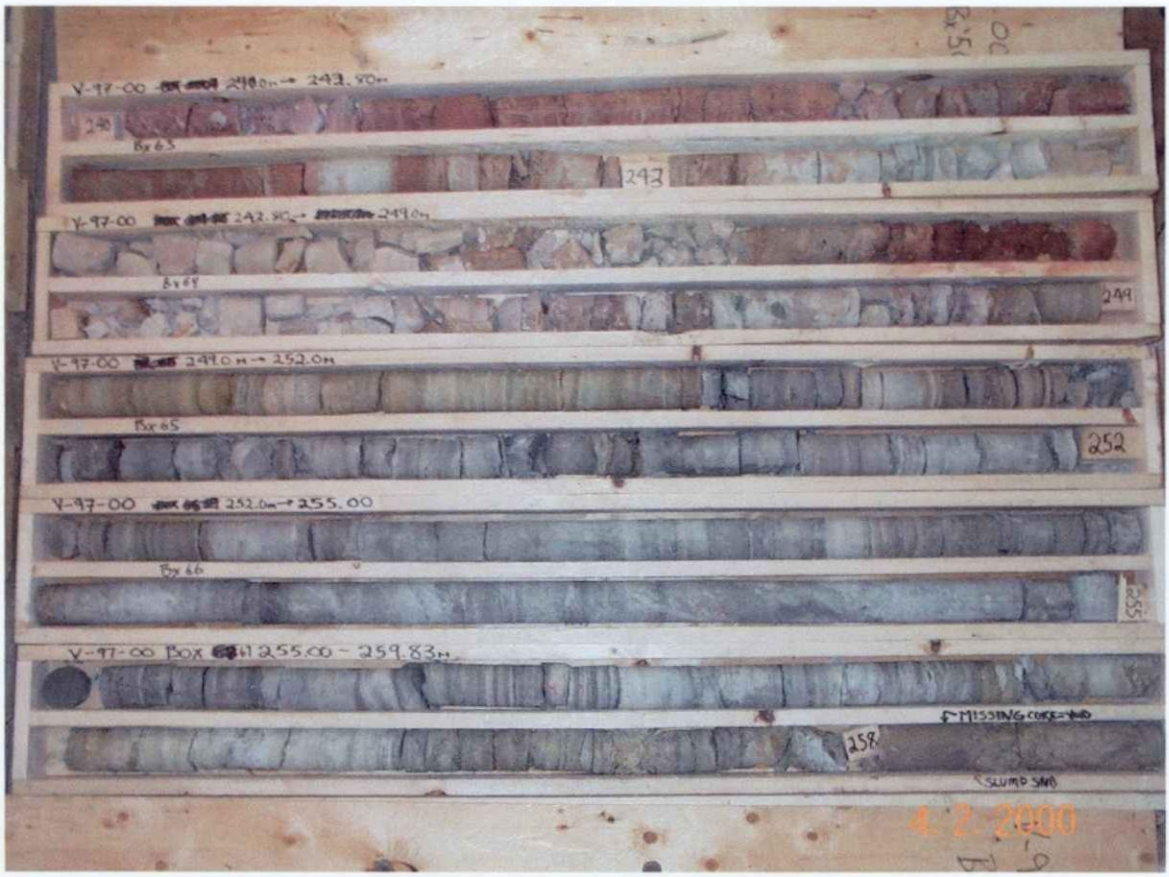


Figure 14: RH/CR Unit C Red Mudstone beds and finely bedded grey mudstone and evaporite sections. Very Weak Geotechnical units.

RQD is high 90%-100% due to the low number of joints observed. The intact rock strength is variable from the incompetent mudstone with a maximum of 20 Mpa to finely bedded limestones averaging 60Mpa to strong dolomites that reach strengths of 150+ Mpa. Overall joint conditions are good. Small-scale surface conditions are stepped smooth. This unit has a fair to poor rating with RMR 36 to 57 and RMS 6-15.

1.7 BCR (BAD CACHE RAPIDS GROUP – UPPER FORMATION)

BCR-DS C A strong geotechnical unit corresponding to the upper formation of the Bad Cache Rapids Group. This unit is comprised of a relatively strong intertidal dolostone.

RQD is a high 90%-100%. Intact rock strength is also high, averaging 71 Mpa and was tested up to 100 Mpa. Overall joint conditions are good with few joints being observed. All joints observed were sub-vertical with small-scale surface conditions that were smooth undulating. This unit has a good RMR of 47to 67 and a RMS 28 to 42.

Figure 15: Upper two core boxes show the BCR dolostone and the fourth box shows the BCR basal sandstone.

1.8 BCR-SS (BAD CACHE RAPIDS GROUP – LOWER FORMATION)

BCR-SS C A weak geotechnical unit corresponding to the lower formation that makes up the Bad Cache Rapids Group. This weakly consolidated, calcareous quartz sandstone is the source of an artesian aquifer.

RQD for this unit was high, 95-100%, because few joints were observed. Intact rock strength averaged 10 Mpa for the pieces that were testable. A large percentage of this material was not testable using the field point load system. Over all joint conditions were difficult to observe due to the friability of the core. This unit has a poor RMR of 19-32 and a RMS of 2-3.

1.9 GA/GN (PRECAMBRIAN BASEMENT)

Ga C A strong geotechnical unit representing the weathered upper 1-1.5m of Precambrian basement (an Ordovician aged erosion surface). IRS values are high but fall short of typical granitoid values. This unit shows that jointing and joint conditions are strong.

Gn C A strong geotechnical unit representing Precambrian basement granitoids. This unit under lies the basin sediments.

RQD is high, 90-100%. Intact rock strength averaged 170 Mpa with a maximum of 200 Mpa. Overall joint conditions were high with small scale joint conditions of stepped rough to stepped smooth. All joint sets but one, were observed to be sub-vertical. This odd set was flat lying and is attributed to glacial rebound pressure release. This unit has a strong RMR 60 C81 and a RMS of 72-107.

Figure 16: Basal sandstone C Altered Granite C Granite basement

INTACT ROCK STRENGTH POINT LOAD TESTS				
Unit	Orientation of test	MAX. IRS (Mpa)	Avg. IRS (Mpa)	Min. IRS(Mpa)
Afm	Parallel	120	60.3	10
	Perpendicular	170	71.6	20
EK/SR	Parallel	68	48	18
	Perpendicular	85	65	23
RH/CR	Parallel	65	23	0
	Perpendicular	175	87	155
RH/CH Dolomite	Parallel	50	26	0
	Perpendicular	174	130	100
BCR	Parallel	110	85	10
	Perpendicular	110	100	10
SS	BOTH	10	5	0
Gn	Parallel	200	190	80
	Perpendicular	210	174	140

Table 1 : Intact Rock Strength Tests from point load data

GEOTECHNICAL ISSUES

WEAK ORDOVICIAN UNITS

Seven geotechnical units have been identified in the host rocks surrounding the Victor kimberlites. Two of the lower Ordovician units (RH/CR, BCR-SS) show fair to poor RMR and RMS values. The weathering properties of these muddy Ordovician formations will create slope stability problems.

Geological formations are consistent in thickness and occurrence locally around the Victor kimberlites and are of locally consistent thickness.

The Precambrian basement in the local area of the Victor kimberlite is comprised of competent granitoid material. Contact of the kimberlite with sedimentary units occurs at a relatively consistent depth of 270-275m.

PRE-CONTACT ZONE

A thick pre-contact zone has been observed on the east side of Victor Main stretching around to the southern side of Victor SW. The sediments between the two kimberlites also have a similar pre-contact zone. This zone may encircle both kimberlites.

The pre-contact zone is characterized by a low number of sub-vertical joints that cut an area of disjointed bedding plains. Geological formation boundaries appear continuous even through these broken units. Therefore the major structural weakness of the pre-contact zone is thought to be the result of a large number of disjointed bedding planes rather than jointing. In small sections, like drill core, it may appear as broken core but as a rock mass may still retain some strength (reference a phone conversation with Jarek Jakubec SRK).

The vertical extent of this zone may continue as far as the Precambrian basement, however, there is no evidence showing that this unit proceeds into the granite. It is also more pronounced in the Silurian sedimentary units and is thought to thin with depth The horizontal extent of this zone was observed as far as 40m from the kimberlite contact on the east side of Victor Main. The 1998 and 1999 delineation drill holes, ended before drilling through the pre-contact zone, and therefore, show a minimum horizontal thickness of 7 to 27m around Victor Main and Victor SW (Figure 9&10).

Pre-contact Zone **Vertical and horizontal extent from kimberlite contact**			
Drill hole ID	**Vertical Depth of Kimberlite Contact (m)**	**Vertical Extent (m)**	**Horizontal Extent (m)**
V-105-00	57	27.7	16
V-37-98	58	16	9.5
V-42-98	87	21.3	21.3
V-36-98	97.5	14.2	14.2
V-90-99	102.8	7.5	18.7
V-43-98	130.8	12.7	12.7
V-87-99	188	0	0
V-88-99	195.6	23.9	14.4

Table 2: Pre-contact zone C Vertical and Horizontal extent.

Figure17 : Pre-contact zone Drill hole V-101-00

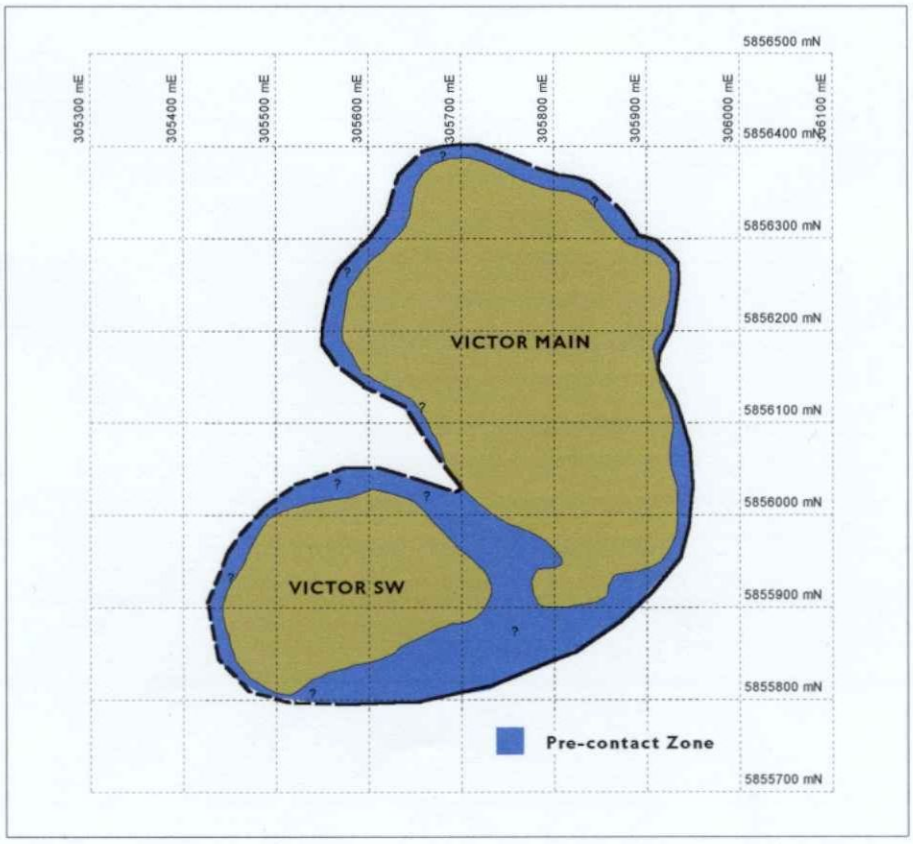
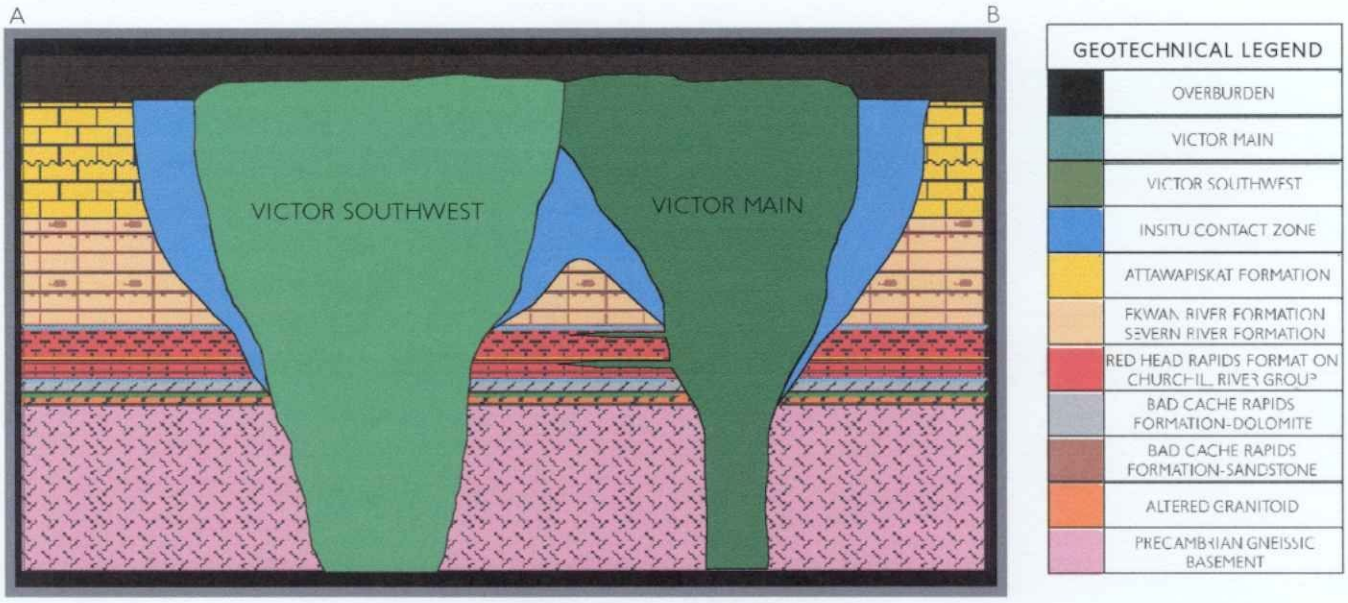


Figure 18 : Conceptual diagram of Pre-contact zone. Dashed boundary on North and West sides of the body assumed due to lack of drill data.

CONCEPTUAL SECTION SHOWING THE RELATIONSHIP BETWEEN GEOTECHNICAL UNITS SURROUNDING AND INCLUDING THE VICTOR MAIN AND VICTOR SOUTHWEST BODIES



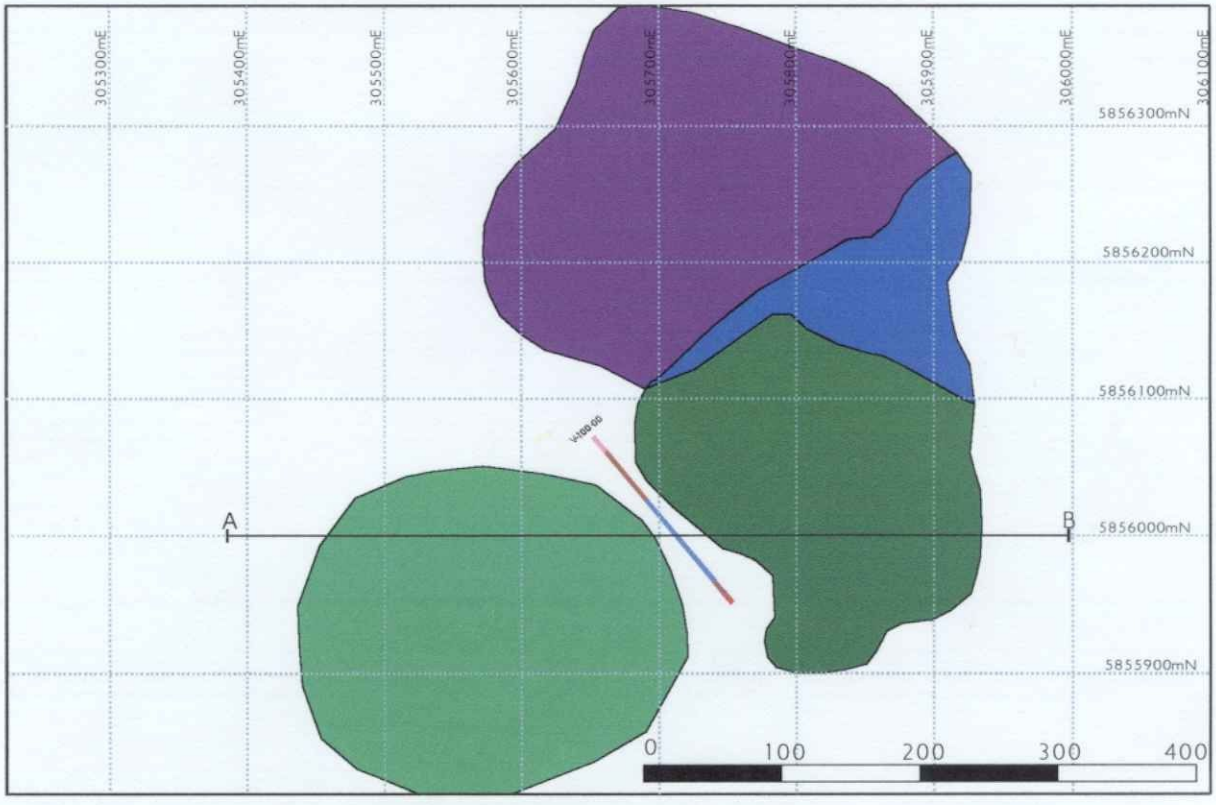


Figure 10: Conceptual cross-section along the 585600mN, through the Victor SW and Victor Main Kimberlites.

BEDDING OF SEDIMENTARY UNITS

Although joints were used to calculate Rock Mass Ratings and Rock Mass Strengths bedding presents a weakness that was not quantified by this number. Therefore calculations were made by combining fracture frequency per metre and the count of open beds per metre. Open beds per metre gives a relative view of the strength of bedding plains within the geotechnical units (Table 4).

Geotechnical Unit	RMR	RMR with bedding	RMS	RMS with bedding
Afm	42-58	39-47	18-24	14-22
EK/SR	42-58	32-50	42-58	32-50
RH/CR	36-57	34-50	36-57	34-50
BCR	47-67	47-59	47-67	47-37
SS	19-32	20-32	2-3	2-3
Ga	58-66	50-66	22-25	18-25
Gn	68-81	60-76	72-107	72-98

Table 3: RMR Comparison C RMR values from joint data only Vs RMR data from Joint and Bedding data.

JOINT SETS

Fracture frequencies are low (1-2 per metre), within the country rock as a whole. Bedding appears to have a greater influence in areas of broken core.

Horizontal jointing and some disjointed bedding plains within kimberlite, sedimentary host rocks and the Precambrian basement have been observed. These features are likely the result of caused by isostatic rebound.

One dominant and several minor sub-vertical joint sets with similar northwest C southeast orientations were observed in all units of sedimentary, Precambrian basement and inferred from observations for units of kimberlite.

Figure 20: Sub-vertical joint in the kimberlite of Trench 1

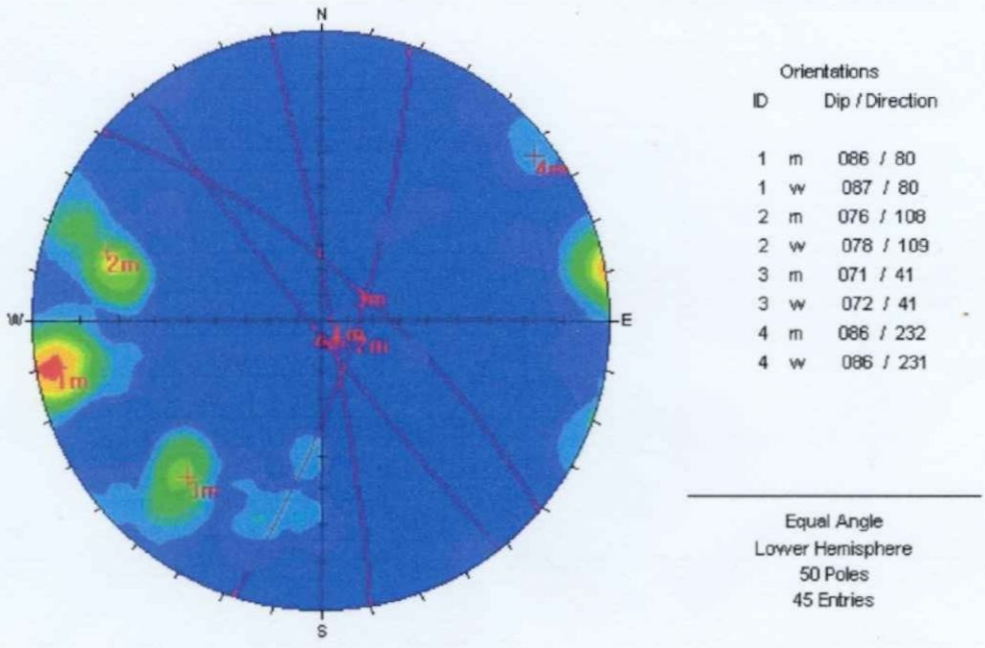


Figure 21: V-98-00 Stereonet C Joint sets

Joint Set Orientations				
Drill Hole	Azimuth	Joints Set ID	Dip	Dip Direction
V-98-00	45	JS1	85	229
			90	3
V-99-00	240	JS1	86	226
			75	105
		JS2	90	89
		JS3	63	12
V-100-00	140	JS3	61	7
		JS4	86	336
			70	254
V-101-00	45	JS1	89	247
		JS4	76	160
			81	188
			50	325
			77	237

Table 4: Recorded Joints sets

WEATHERING

Weathering tests revealed that the mudstone occurring in the Ordovician sediments are highly susceptible to erosion, with exposure to water. The depths of these units are from 220m to 261m vertical.

APPENDIX 1

GEOLOGICAL LOGS

STRATIGRAPHIC SECTIONS

MONOPROS LIMITED
VICTOR 2000 KIMBERLITE PROJECT
GEOLOGICAL DRILL HOLE LOGS

HOLE NUMBER: V-97-00	Page 1 of 3

DATE STARTED:	28 January 2000
DATE COMPLETED:	05 Feburary 2000
COLLAR LOCATION:	5856446 N 305595E
NTS SHEET:	43B/13
DIP ANGLE:	90°
AZIMUTH:	0°
DRILL TYPE:	LF-70
CONTRACTOR:	Boart Longyear
DRILL BIT:	HQ3
CORE DIAMETER:	61.1 mm
FINAL DEPTH:	282m
LOGGED BY:	DE/DO/JB
COMMENTS:	Geotechnical data was recovered

SUMMARY

FROM(m)	TO(m)	DESCRIPTION
0	63.9	Overburden
63.9	135.2	**Attawapiskat Formation** C Massive barrier reef carbonates
135.2	220.2	**Ekwan/Severn River Formations** C Reef to Inter-reef sediments
220.2	261.6	**Red Head Rapids Formation and Churchill River Group** C Transgressive-Restricted marine mudstones sandstones and evaporites
261.6	271.9	
271.9	273.4	**Bad Cache Rapids Group** - Massive Inter- tidal dolostone
273.4	274.8	**Bad Cache Rapids Group** C Transgressive basal sandstone
274.8	282.0	**Altered Granitoid**
	282.0	**Gneiss**
		EOH

DESCRIPTION

FROM(m)	TO(m)	DESCRIPTION
0	63.9	**Overburden** Two sequences of marine sediments grading from mud to course gravel.
63.9	135.2	**Attawapiskat Formation** Massive Pale brown to tan coloured mottled limestone. Bedding plains are rough and break irregularly because of boiturbation. Bedding is flat lying in the section sampled, however bedding can tilt up to 35 degrees near reef complexes in this formation. It is thought that isostatic uplift has affected some of the bedding plains. These affected beds appear disjointed forming gaps up to 6.0mm. Fossils are common to abundant throughout this unit. Areas

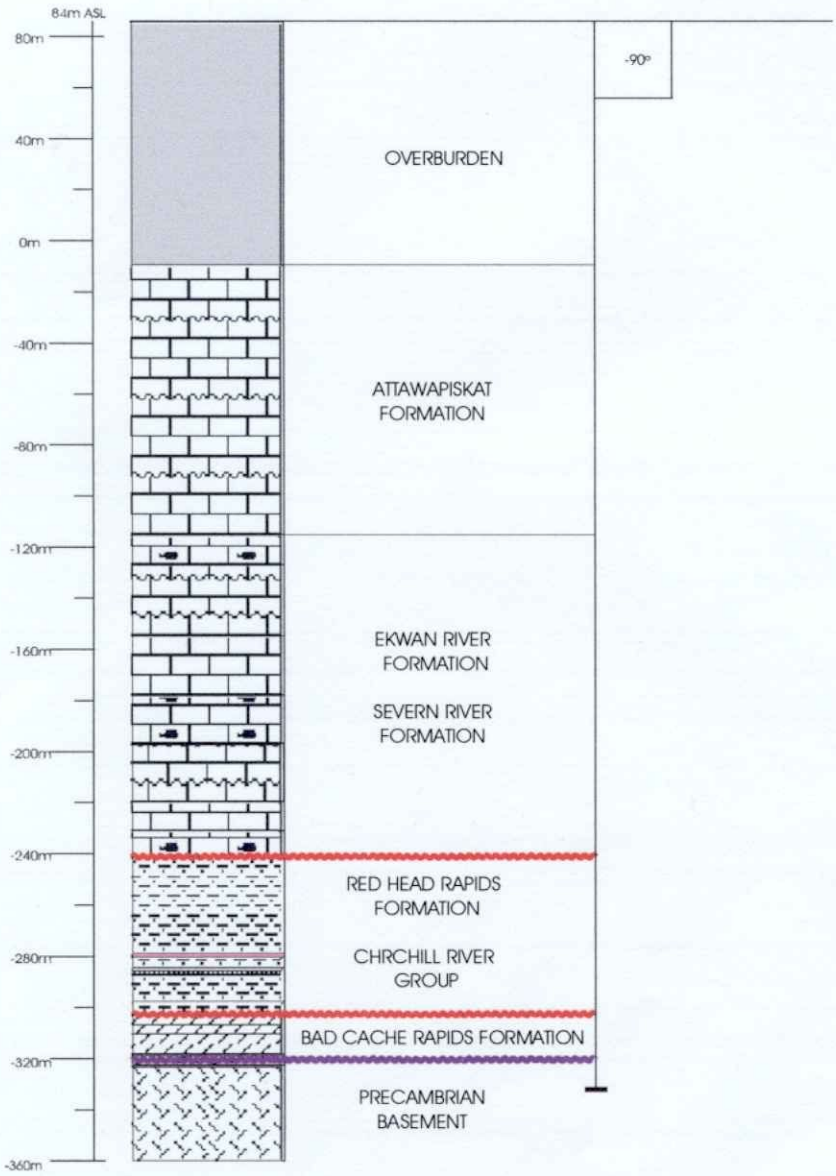
DESCRIPTION (CONTINUED)

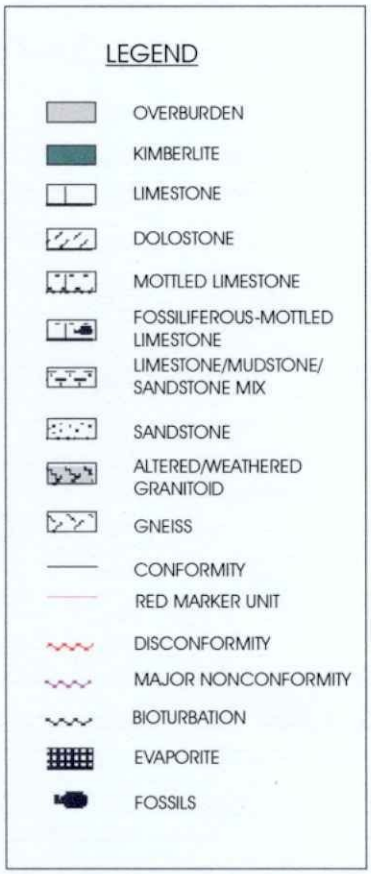
		that are highly fossiliferous have a microkarst characteristic. Karst voids or vugs however, do not appear to be interconnected in most cases. Black to dark brown chert nodules occur within two horizons in the limestone. 69-74m Chert nodule horizon 96-102m Chert nodule horizon Two sections of high porosity occurr at 78m and 102m relate to microkarst limestone. Broken core was observed in these areas. The borken core here was attributed to karst features not jointing
135.2	220.2	**Ekwan River Severn River Formations** These formations represent inter-reef to near-reef environments comprised of alternating beds of finely laminated limestone, minor interbedded mudstone, microkarst limestone, cherty limestone and fossiliferous mottled limestone. Bedding is flat lying within this unit. Finely laminated limestones are white grey to pale brown and tan in colour. Comprised almost entirely of silt size calcareous material. Very fine beds are visible and have been measured to be flat lying. Cherty Limestones are light brown to pale brown in colour and are commonly fossiliferous. Microkarst limestone and carbonate units vary from vuggy light brown and tan limestone to a grey brown fossiliferous carbonate. Both units are fossiliferous. The carbonate unit is relatively porous. Mottled limestone is similar in appearance to that seen in the overlying Attawapiskat Formation. These units are highly fossiliferous and have more distinct colour differences between beds. Beds range in colour from cream yellow to pale brown. One of these fossiliferous mottled limestone units occurs at the base of the Severn River Formation (the 438Ma Silurian-Ordovician boundary) above the Ordovician sediments Mottled Limestone occurrences 174-176.5m 183-188m 202-220.2m 220.2m 438Ma Silurian Ordovician unconformity
220.2	261.6	**Ordovician** **Red Head Rapids Formation and Churchill River Group** These two groups represent transgressive sequences that terminate in restricted marine environments. Sandstone layers followed by intertidal limestones or dolostone represent transgression. Restricted marine environments are represented by light to dark grey finely bedded mudstones containing beds of gypsum and anhydrite (evaporites).

DESCRIPTION (CONTINUED)

		Two red stained sandstone and mudstone units occur at the top of the evaporite units. Grading from sandstone to mudstone followed by a unit of a mudstone breccia represents this section. The red stained graded beds are interpreted as transitional deposits between the restricted marine muds and a new transgressive sequence.
	220.2	438Ma Silurian C Ordovician boundary marked by the end of the Silurian fossilferous mottled limestone and the first occurrence of mudstone.
222.9	228.0	Red stained mudstone grading to sandstone. This transition unit is high susceptibility to weathering.
	239.0	One metre of brecciated grey and red stained mudstone.
245.7	246.0	Highly stained bed of red Sandstone to mudstone. This unit correlates between drill holes.
248.8	258.0	Restricted marine unit. Beds of finely bedded light grey and dark grey mudstone inter-bedded with thin beds of gypsum and anhydrite.
258.0	261.6	An alternating unit of sandstone and limestone representing the beginning of a transgressive sequence.
261.6	**262.1**	**Boas River Shale** A thin 5cm layer of petroliferous black shale that marks the unconformity at the top of the Bad Cache Rapids Group.
261.6	**271.9**	**Bad Cache Rapids Group** Inter-tidal massive grey dolostone with abundant trace fossils.
271.9	**273.4**	Basal calcareous quartz sandstone represents the first marine transgression over the Canadian Shield at ~450 Ma. This unit is weakly consolidated with calcite cementing well-washed coarse quartz sand.
		PRECAMBRAIN BASEMENT
273.4	**274.8**	**Altered Granitoid**. Granitoid material here is discolored and appears weathered. This unit represents the Precambrian basement 450Ma erosion surface.
274.8	**282.0**	**Gneiss**. Well-defined compositional bands of quartz biotite and feldspar occur in this competent section of basement rock.
	282.0	EOH

VICTOR 2000
GEOTECHNICAL DRILL PROGRAM
V-97-00 STRATIGRAPHIC SECTION





MONOPROS LIMITED
VICTOR 2000 KIMBERLITE PROJECT
GEOLOGICAL DRILL HOLE LOGS

HOLE NUMBER: V-98-00	Page 1 of 3

DATE STARTED:	05 Feburary 2000
DATE COMPLETED:	11 Feburary 2000
COLLAR LOCATION:	5855975 N 305400 E
NTS SHEET:	43B/13
ANOMALY NUMBER:	V
DIP ANGLE:	60°
AZIMUTH:	045°
DRILL TYPE:	LF-70
CONTRACTOR:	Boart Longyear
DRILL BIT:	HQ
CORE DIAMETER:	63.5 mm
FINAL DEPTH:	312.0
LOGGED BY:	DE/DO/JB
COMMENTS:	

SUMMARY

FROM	TO	DESCRIPTION
0	39.5	Overburden
39.5	146.7	**Attawapiskat Formation** C Massive barrier reef carbonates
146.7	243.4	**Ekwan/Severn River Formations** C Reef to Inter-reef sediments
243.4	289.0	**Red Head Rapids Formation and Churchill River Group-** Transgressive-restricted marine mudstones sandstones and
289.0	300.6	evaporites
300.6	303.1	**Bad Cache Rapids Group** - Massive Inter- tidal dolostone
303.1	305.4	**Bad Cache Rapids Group** C Transgressive basal sandstone
305.4	312.0	**Altered Granitoid**
	312.0	**Gneiss**
		EOH

DESCRIPTION

FROM	TO	DESCRIPTION
0	39.5	Overburden
39.5	146.7	**Attawapiskat Formation** Massive Pale brown to tan coloured mottled limestone. Bedding plains are rough and break irregularly due to boiturbation. Bedding is flat lying in the section sampled, however bedding can tilt up to 35 degrees near reef complexes in this formation. It is thought that isostatic uplift has affected the some of the bedding plains. These affected beds appear disjointed forming gaps up to 6.0mm. Fossils are common to abundant throughout this unit. Areas

DESCRIPTION (CONTINUED)

		that are highly fossiliferous have a microkarst characteristic, however karst voids or vugs for the most part do not appear interconnected. Black to Dark brown chert nodules occur at two horizons within the limestone. 75-86m Chert nodule horizon 129-130m Chert nodule horizon Two sections that corrolate with the high porosity sections that occurred in V-97-00 occured at 69 metres and 112 metres. These areas relate to karst limestone that was recovered by the drill relatively broken. At 69m interbedding of limestone and mudstone is observed for 10-15m. At 112m, in fossiliferous mottled limestone, rusty brown water staining was observed on bedding plains as well as coating larger vugs.
146.7	243.4	**Ekwan River Severn River Formations** These formations represent inter-reef to near-reef environments comprised of alternating beds of finely laminated limestone, minor interbedded mudstone, microkarst limestone, cherty limestone and fossiliferous mottled limestone. Bedding is flat lying within this unit Finely laminated limestones are white C grey to pale brown and tan in colour. Comprised almost entirely of silt size calcareous material. Very fine beds are visible and have been measured to be flat lying. Cherty Limestones are light brown to pale brown in colour and are commonly fossiliferous. Microkarst limestone and carbonate units vary from vuggy light brown to tan limestone to a grey brown fossiliferous carbonate. Both units are fossiliferous. The carbonate unit is relatively porous. These units seem to relate to broken core more so than in hole V-97-00 Mottled limestone is similar in appearance to that seen in the above Attawapiskat Formation. These units are highly fossiliferous and have more distinct colour differences between beds. Beds range in colour from cream yellow to pale brown. One of these fossiliferous mottled limestone units occurs at the base of the Severn River Formation (the 438Ma Silurian-Ordovician boundary) above the Ordovician sediments Mottled Limestone Occurrences 198.0 - 210.0m 219.0 C 243.4m 243.4m 438Ma Silurian Ordovician Unconformity
243.4	289.0	**Ordovician** **Red Head Rapids Formation and Churchill River Group** These two groups represent transgressive sequences that terminate in restricted marine environments. Sandstone layers followed by intertidal limestones or dolostone represent

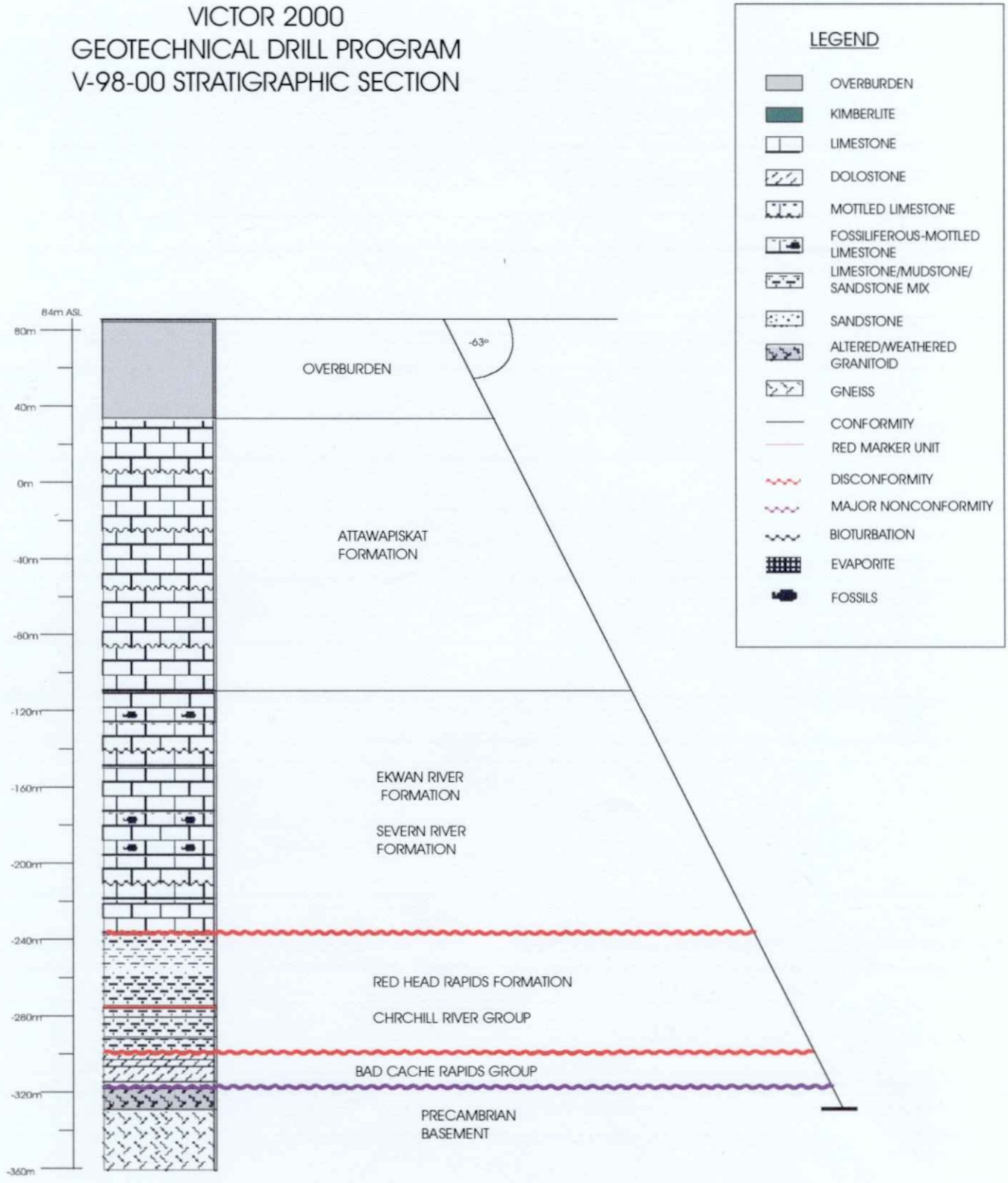
DESCRIPTION (CONTINUED)

		transgression. Restricted marine environments are represented by light to dark grey finely inter-bedded mudstones containing beds of gypsum and anhydrite (evaporites). Two red stained graded sandstone to mudstone units occur at the top of the evaporite units. Grading from sandstone to mudstone occurs as well as a unit of brecciated mudstone. The red stained graded beds are interpreted as transitional deposits as environements change from restricted marine muds to a new transgressive sequence.
	243.4	438Ma Silurian C Ordovician boundary marked by the end of the Silurian fossilferous mottled limestone and the first occurrence of mudstone.
245.5 261.6	249.0 268.7	Red stained mudstone grading to sandstone. Transition unit with high susceptibility to weathering.
263.5 271.3	266.0 271.8	Brecciated grey and red stained mudstone bed. Highly stained red sandstone to mudstone bed. This unit correlates between drill holes.
275.0	283.2	Restricted marine unit. Beds of finely bedded light grey and dark grey mudstone inter bedded with thin beds of gypsum and anhydrite.
283.2	289.0	Alternating unit of sandstone and limestone representing the beginning of a transgressive sequence.
289.0	**289.05**	**Boas River Shale** A thin 5cm layer of petroliferous black shale that marks the Silurian-Ordovician unconformity at the top of the Bad Cache Rapids Group.
289.0	**300.6**	**Bad Cache Rapids Group** Intertidal massive grey dolostone. With abundant trace fossils. It represents intertidal conditons that followed the initial transgression.
300.6	**303.1**	Basal calcareous quartz sandstone representing the onset of a the first marine transgression over the Canadian Shield. The transgression is thought to have occurred at ~450 Ma. This unit is weakly consolidated with coarse quartz sand. Weathering of this sandstone quickly turnes it from a tan colour to a rusty yellow.
		PRECAMBRAIN BASEMENT
303.1	**305.4**	**Altered Granitoid**. Granitoid material here is discolored and appears weathered. This approximately 1m thick section markes the boundary of the Precambrian basement at ~450 Ma. This is likely an erosion surface.
305.4	**312.0**	**Gneiss**. Well-defined compositional bands of quartz biotite and feldspar occur in this competent section of basement rock.

DESCRIPTION (CONTINUED)

	312.0	This unit has many subvertical joints coated with black chlorite. Isostatic rebound related horizontal fractures are present. EOH

VICTOR 2000
GEOTECHNICAL DRILL PROGRAM
V-98-00 STRATIGRAPHIC SECTION



MONOPROS LIMITED
VICTOR 2000 KIMBERLITE PROJECT
GEOLOGICAL DRILL HOLE LOGS

HOLE NUMBER: V-99-00	Page 1 of 3

DATE STARTED:	11 Feburary 2000
DATE COMPLETED:	19 Feburary 2000
COLLAR LOCATION:	5855825 N 305725 E
NTS SHEET:	43B/13
ANOMALY NUMBER:	V
DIP ANGLE:	62°
AZIMUTH:	260°
DRILL TYPE:	LF-70
CONTRACTOR:	Boart Longyear
DRILL BIT:	HQ
CORE DIAMETER:	63.5 mm
FINAL DEPTH:	317.5 m
LOGGED BY:	DE/DO/JB
COMMENTS:	

SUMMARY

FROM	TO	DESCRIPTION
0	14.6	Overburden
14.6	147.5	**Attawapiskat Formation** C Massive barrier reef carbonates
147.5	246.0	**Ekwan/Severn River Formations** C Reef to Inter-reef sediments
246.0	293.8	**Red Head Rapids Formation and Churchill River Group** C Transgressive-Restricted marine mudstones sandstones and evaporites
293.8	305.8	
305.8	309.2	**Bad Cache Rapids Group** - Massive Inter- tidal dolostone
309.2	310.3	**Bad Cache Rapids Group** C Transgressive basal sandstone
310.3	317.5	**Altered Granitoid**
317.5	317.5	**Gneiss**
		EOH

DESCRIPTION

FROM	TO	DESCRIPTION
0	14.6	Overburden
14.6	147.5	**Attawapiskat Formation** Massive Pale brown to tan coloured mottled limestone. Bedding plains are rough and break irregularly due to boiturbation. Bedding is flat lying in the section sampled, however bedding can tilt up to 35 degrees near reef complexes in this formation. It is thought that isostatic uplift has affected the some of the bedding plains. These affected beds appear disjointed forming gaps up to 6.0mm. Fossils are common to abundant throughout this unit. Areas that are highly fossiliferous have a microkarst characteristic.

DESCRIPTION (CONTINUED)

		however karst voids or vugs for the most part do not appear interconnected. Black to Dark brown chert nodules occur within three horizons in the limestone. 22-24m Chert nodule horizon 79-91m Chert nodule horizon 145-146m Chert nodule horizon The first 38m of core recovered was quite broken. It does not appear that multiple joint sets have caused this section of broken core, This may have been caused by a combination of weakly cemented bedding plains and an occasional vertical joint. Massive mottled limestone does not dominate the first 50m in this section as it does in other drill holes. Chalky laminated limestone and cherty limestone are common. Between 31-34m and 40-44m a grey brown fossiliferous vuggy carbonate was recovered. These sections appear to be quite porous.
46.8	51.0	A section of microkarst mottled limestone with areas of water staining. The microkarst character of the rock can be seen to a depth of 60m, but little water staining occurs in this section below 51m.
73.5	81.0	A section of broken core. Water staining is present in areas.
90.0	97.5	Mottled limestione becomes coarse and sandy in areas. Potentially an area of higher porosity.
117.0	118.0	A section of broken and water stained mottled limestone was recovered.
147.5	**246.0**	**Ekwan River Severn River Formations** These formations represent inter-reef to near-reef environments comprised of alternating beds of finely laminated limestone, minor interbedded mudstone, microkarst limestone, cherty limestone and fossiliferous mottled limestone. Bedding is flat lying within this unit Finely laminated limestones are white C grey to pale brown and tan in colour. Comprised almost entirely of silt size calcareous material. Very fine beds are visible and have been measured to be flat lying. Cherty Limestones are light brown to pale brown in colour and are commonly fossiliferous. Microkarst limestone and carbonate units vary from vuggy light brown to tan limestone to a grey brown fossiliferous carbonate. The carbonate unit is relatively porous. These units seem to relate to broken core more so than in hole V-97-00 Mottled limestone is similar in appearance to that seen in the

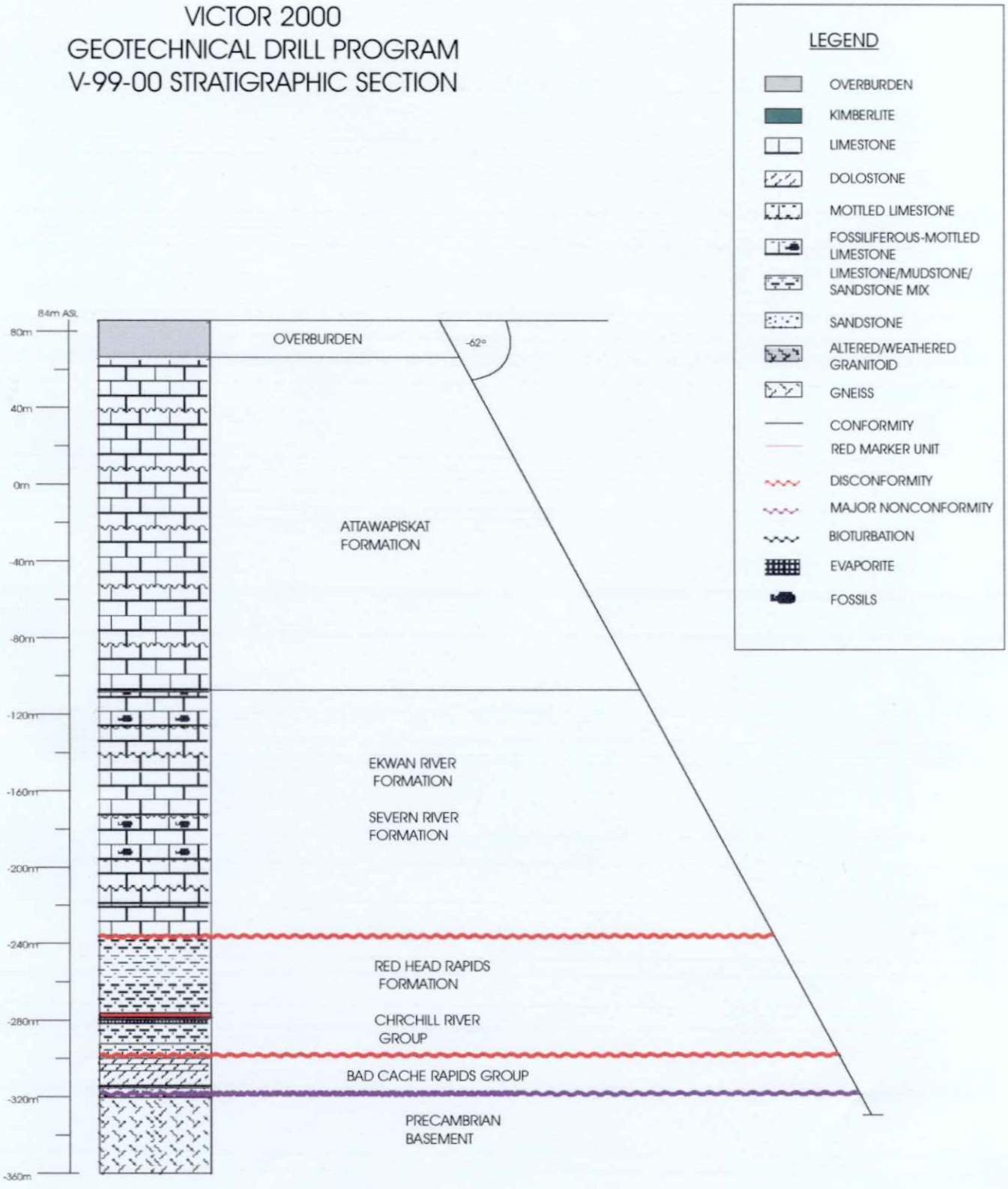
DESCRIPTION (CONTINUED)

		above Attawapiskat Formation. These units are highly fossiliferous and have more distinct colour differences between beds. Beds range in colour from cream yellow to pale brown. One of these fossiliferous mottled limestone units occurs at the base of the Severn River Formation (the 438Ma Silurian-Ordovician boundary) above the Ordovician sediments Mottled Limestone occurrences 177.0 C 183m 192 C 213m 225- 246 246.0m 438Ma Silurian Ordovician unconformity The upper 30m of this unit was recovered highly fractured. Water staining is common in this unit and ranged from common staining on bedding faces to 0.4m sections of weathered/satined core. Below 175m, the core recovered becomes relatively unbroken, the typical appearance of these formations. This broken section may be part of the precontact broken sediments.
246.0	**293.8**	**Ordovician** **Red Head Rapids Formation and Churchill River Group** These two groups represent transgressive sequences that terminate in restricted marine environments. Sandstone layers followed by intertidal limestones or dolostone represent transgression. Restricted marine environments are represented by light to dark grey finely bedded mudstones containing beds of gypsum and anhydrite (evaporites). Two red stained sandstone and mudstone units have occur at the top of evaporite units. These units grade from sandstone to mudstone and contain a section of mudstone breccia. These are interpreted as transitional deposits between the restricted marine muds and a new transgressive sequence.
	246.0	438Ma Silurian C Ordovician boundary marked by the end of the Silurian fossilferous mottled limestone and the first occurrence of mudstone.
249.0 265.0	251.9 268.0	2 units - Red stained mudstone grading to sandstone. Transition unit. High susceptibility to weathering.
268.0	270.0	Brecciated grey and red stained mudstone bed
276.3	277.0	Highly stained red Sandstone to mudstone bed. This unit correlates between drill holes.
279.0	283.2	Restricted marine unit. Beds of finely bedded Light grey and Dark grey mudstone inter bedded with thin beds of gypsum and anhydrite.
288.4	293.8	Alternating unit of sandstone and limestone representing the beginning of a transgressive sequence.

DESCRIPTION (CONTINUED)

293.8	293.82	**Boas River Shale** A thin layer dark brown to black clay at the top of the Bad Cache Rapids dolostone. This layer is thought to be the petroliferous black shale that marks the Silurian-Ordovician unconformity at the top of the Bad Cache Rapids Group. There is a good corolation between this unit and the occurance of thicker Boas River shales in holes V-97-00 and V-98-00.
293.8	305.8	**Bad Cache Rapids Group** Intertidal massive grey dolostone. This unit has abundant trace fossils and represents intertidal stage of the transgressive sequence.
305.8	309.2	Basal calcareous quartz sandstone representing the beginning of the transgressive sequence. This unit is weakly consolidated with coarse quartz sand. The lower 2.6m of this sandstone is water stained to a rusty brown colour.
		PRECAMBRAIN BASEMENT
309.2	310.3	**Altered Granitoid**. Precambrain basement material is altered for ~1metre to a red vuggy granitoid. No joints cut this section. Those that do are attributed to isostatic rebound. This 1 metre unit represents an ~450Ma-erosion surface.
310.3	317.5	**Gneiss**. Well-defined compositional bands of quartz biotite and feldspar occur in this competent section of basement rock. Jointing in this unit is dominantly horizontal related to Isostatic rebound
	317.5	EOH

VICTOR 2000
GEOTECHNICAL DRILL PROGRAM
V-99-00 STRATIGRAPHIC SECTION



MONOPROS LIMITED
VICTOR 2000 KIMBERLITE PROJECT
GEOLOGICAL DRILL HOLE LOGS

HOLE NUMBER: V-100-00	Page 1 of 3

DATE STARTED:	21 Feburary 2000
DATE COMPLETED:	24 Feburary 2000
COLLAR LOCATION:	5856261.0 N 305665.0 E
GRID COORD.:	75S, 50W
NTS SHEET:	43B/13
DIP ANGLE AT 0 m:	62°
AZIMUTH:	140°
DRILL TYPE:	LF-70
CONTRACTOR:	Boart Longyear
DRILL BIT:	HQ
CORE DIAMETER:	63.5 mm
FINAL DEPTH:	327 m
LOGGED BY:	DE/DO/JB
COMMENTS:	

SUMMARY

FROM(m)	TO(m)	DESCRIPTION
0	35.7	**Overburden**
35.7	127.9	**Attawapiskat Formation** C Massive reef carbonates
127.9	283.5	**Kimberlite**
283.5	298.4	**Red Head Rapids Formation and Churchill River Group** C Transgressive-Restricted marine mudstones sandstones and evaporites
298.4	311.6	
311.6	313.8	**Bad Cache Rapids Group** - Massive Inter- tidal Dolostone
313.8	327.0	**Bad Cache Rapids Group** C Transgressive basal sandstone
	327.0	**Gneiss**
		EOH

DESCRIPTION

FROM(m)	TO(m)	**DESCRIPTION**
0	35.7	**Overburden**
35.7	127.9	**Attawapiskat Formation** Massive Pale brown to tan coloured mottled limestone. Bedding plains are rough and break irregularly due to boiturbation. Bedding is flat lying in the section sampled, however bedding can tilt up to 35 degrees near reef complexes in this formation. It is thought that isostatic uplift has affected the some of the bedding plains. These affected beds appear disjointed forming gaps up to 6.0mm. Fossils are common to abundant throughout this unit. Areas that are highly fossiliferous have a microkarst characteristic, however karst voids or vugs for the most part do not appear interconnected. Chert nodules were not observed within the

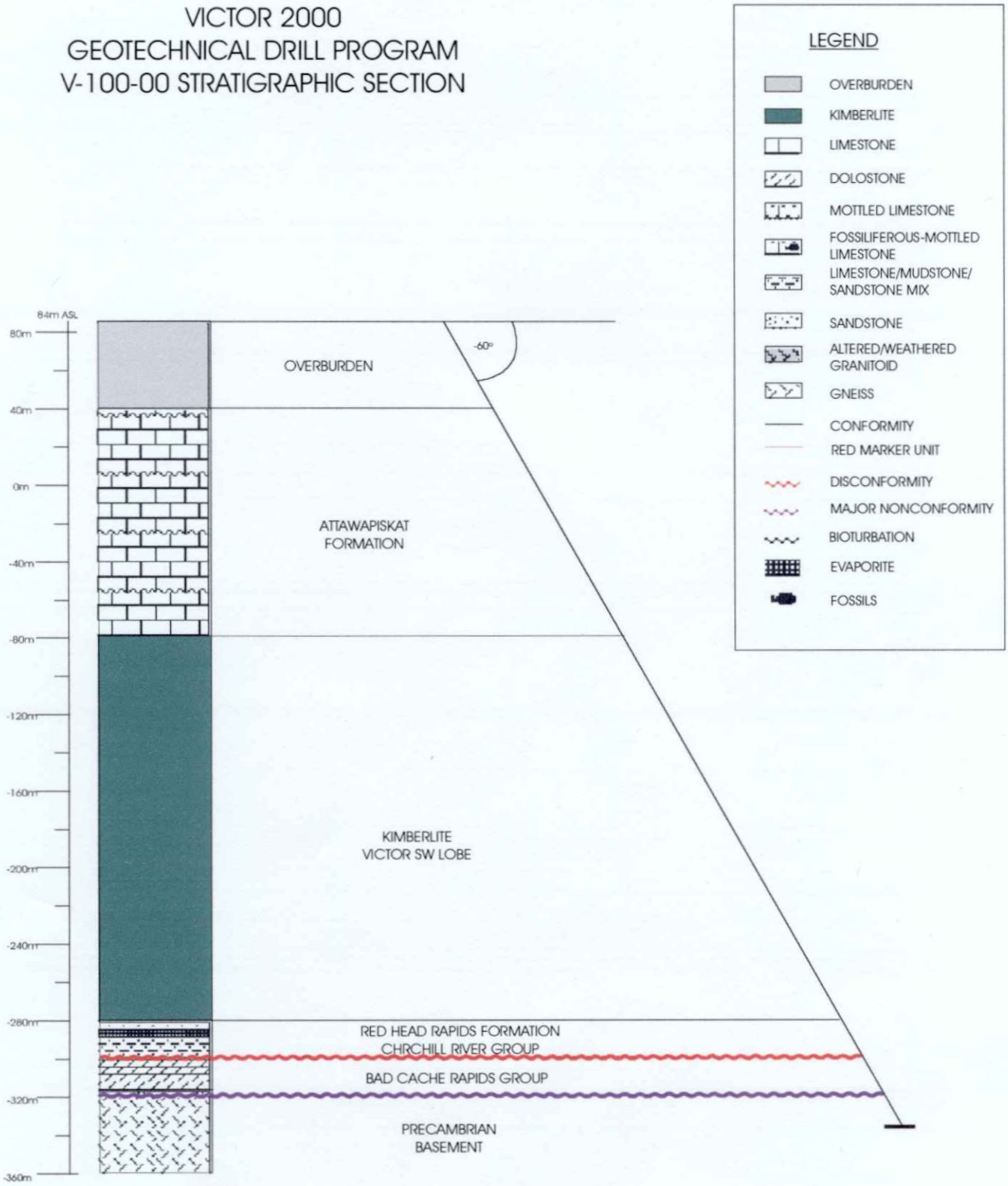
DESCRIPTION (CONTINUED)

		limestone of this unit.
127.9	283.5	**Kimbelite** To be Logged by BHSS/CMH The kimberlite contact with the Attawapiskat Formation is solid and competent. A small 30cm section of discoloured kimberlite is observed at the upper contact. Kimberlite throughout this section is solid with core recoveries and rock quality desigingations 95-100% The lower contact with the Ordivician sediments occurs almost exactly below the red sandy 0.8m marker bed above the evaporite unit. Kimberlite adjacent to the contact is discoloured to a rusty brown colour within 4m of the sedimentary rock contact.
283.5	298.4	**Ordovician** **Red Head Rapids Formation and Churchill River Group** These two groups represent transgressive sequences that terminate in restricted marine environments. Sandstone layers followed by intertidal limestones or dolostone represent transgression. Restricted marine environments are represented by light to dark grey finely bedded mudstones containing beds of gypsum and anhydrite (evaporites).
283.5	296.7	Restricted marine unit. Beds of finely bedded Light grey and dark grey mudstone inter bedded with thin beds of gypsum and anhydrite. Alternating unit of sandstone and limestone representing the beginning of a transgressive sequence.
	289.4	**Boas River Shale** A thin layer of dark brown to black clay at the top of the Bad Cache Rapids dolostone. This layer is thought to be the petroliferous black shale that marks the Silurian-Ordovician unconformity at the top of the Bad Cache Rapids Group. This bed is represented in this hole by a dark staining and a coating of mud on the bed face at the top of the dolostone bed. It may have been washed away by the drill.
289.4	311.6	**Bad Cache Rapids Group** Intertidal massive grey dolostone. This unit has abundant trace fossils and represents the intertidal muds of the transgressive sequence
311.6	313.8	Basal calcareous quartz sandstone representing the beginning of the transgressive sequence at ~450 Ma. Calcite weakly consolidates a clean coarse quartz sand.
313.8	327.0	**PRECAMBRAIN BASEMENT** **Gneiss**. This section of core is well jointed and has weak to well defined compositional bands of quartz biotite and feldspar

DESCRIPTION (CONTINUED)

		occur in this competent section of basement rock. In areas this section of core is discoloured. An erosion surface of altered granite was not observed. Jointing in this unit is dominantly subvertical
	327.0	EOH

VICTOR 2000
GEOTECHNICAL DRILL PROGRAM
V-100-00 STRATIGRAPHIC SECTION



MONOPROS LIMITED
VICTOR 2000 KIMBERLITE PROJECT
GEOLOGICAL DRILL HOLE LOGS

HOLE NUMBER: V-101-00	Page 1 of 4

DATE STARTED:	19 Feburary 2000
DATE COMPLETED:	29 Feburary 2000
GRID:	V
COLLAR LOCATION:	5855999 N 305900 E
NTS SHEET:	43B/13
ANOMALY NUMBER:	V
DIP ANGLE AT 0 m:	70°
AZIMUTH:	050°
DRILL TYPE:	LF-70
CONTRACTOR:	Boart Longyear
DRILL BIT:	HQ
CORE DIAMETER:	63.5 mm
FINAL DEPTH:	300.0 m
LOGGED BY:	DE/DE/JB
COMMENTS:	

SUMMARY

FROM	TO	DESCRIPTION
0	10.8	**Overburden**
10.8	78.4	**Kimberlite**
78.4	144.0	**Attawapiskat Formation** C Massive barrier reef carbonates
144.0	234.5	**Ekwan/Severn River Formations** C Reef to Inter-reef sediments
234.5	277.0	**Red Head Rapids Formation and Churchill River Group** C Transgressive-Restricted marine mudstones sandstones and evaporites
277.0	289.0	
289.0	291.1	**Bad Cache Rapids Group** - Massive Inter- tidal dolostone
291.1	292.1	**Bad Cache Rapids Group** C Transgressive basal sandstone
292.1	327.0	**Altered Granitoid**
	327.0	**Gneiss** EOH

DESCRIPTION

FROM	TO	DESCRIPTION
0	10.8	**Overburden**
10.8	78.8	**Kimberlite** To be Logged by BHSS/CMH This secton of kimberlite is solid with greater than 90% recovery and rock quality desigination up to the sharp sedimentary contact. Only a small 30-40cm section of kimberlite was discoloured adjacent to the sedimentarry rock contact. On the country rock side of the contact, sedimentary rock quickly became highly broken forming a large precontact zone.

DESCRIPTION (CONTINUED)

78.8	**144.0**	**Attawapiskat Formation** Massive Pale brown to tan coloured mottled limestone. Bedding plains are rough and break irregularly because of the boiturbation. Bedding is flat lying in the section sampled, however bedding can tilt up to 35 degrees near reef complexes in this formation. It is thought that isostatic uplift has affected the some of the bedding plains. These affected beds appear disjointed forming gaps up to 6.0mm. Fossils are common to abundant throughout this unit. Areas that are highly fossiliferous have a microkarst characteristic, however karst voids or vugs for the most part do not appear interconnected. Black to dark brown chert nodules occur at one horizons within the limestone.
114.0	115.0	Chert nodule horizon
78.8	104.6	Forms a 25.8m section of broken core that represents the precontact sedimentary units adjacent to the kimberlite contact
123.0	144.0	A section of broken core extending the broken zone out 21.0m horizontal from the kimberlite
144.0	**234.5**	**Ekwan River Severn River Formations** These formations represent inter-reef to near-reef environments comprised of alternating beds of finely laminated limestone, minor interbedded mudstone, microkarst limestone, cherty limestone and fossiliferous mottled limestone. Bedding is flat lying within this unit. Finely laminated limestones are white grey to pale brown and tan in colour. Comprised almost entirely of silt size calcareous material. Very fine beds are visible and have been measured to be flat lying. Cherty Limestones are light brown to pale brown in colour and are commonly fossiliferous. Microkarst limestone and carbonate units vary from vuggy light brown to tan limestone to a grey brown fossiliferous carbonate. Both units are fossiliferous. The carbonate unit is relatively porous. These units seem to relate to broken core more so than in hole V-97-00 Mottled limestone is similar in appearance to that seen in the above Attawapiskat Formation. These units are highly fossiliferous and have more distinct colour differences between beds. Beds range in colour from cream yellow to pale brown. One of these fossiliferous mottled limestone units occurs at the base of the Severn River Formation (the 438Ma Silurian-Ordovician boundary) above the Ordovician sediments Mottled Limestone occurrences

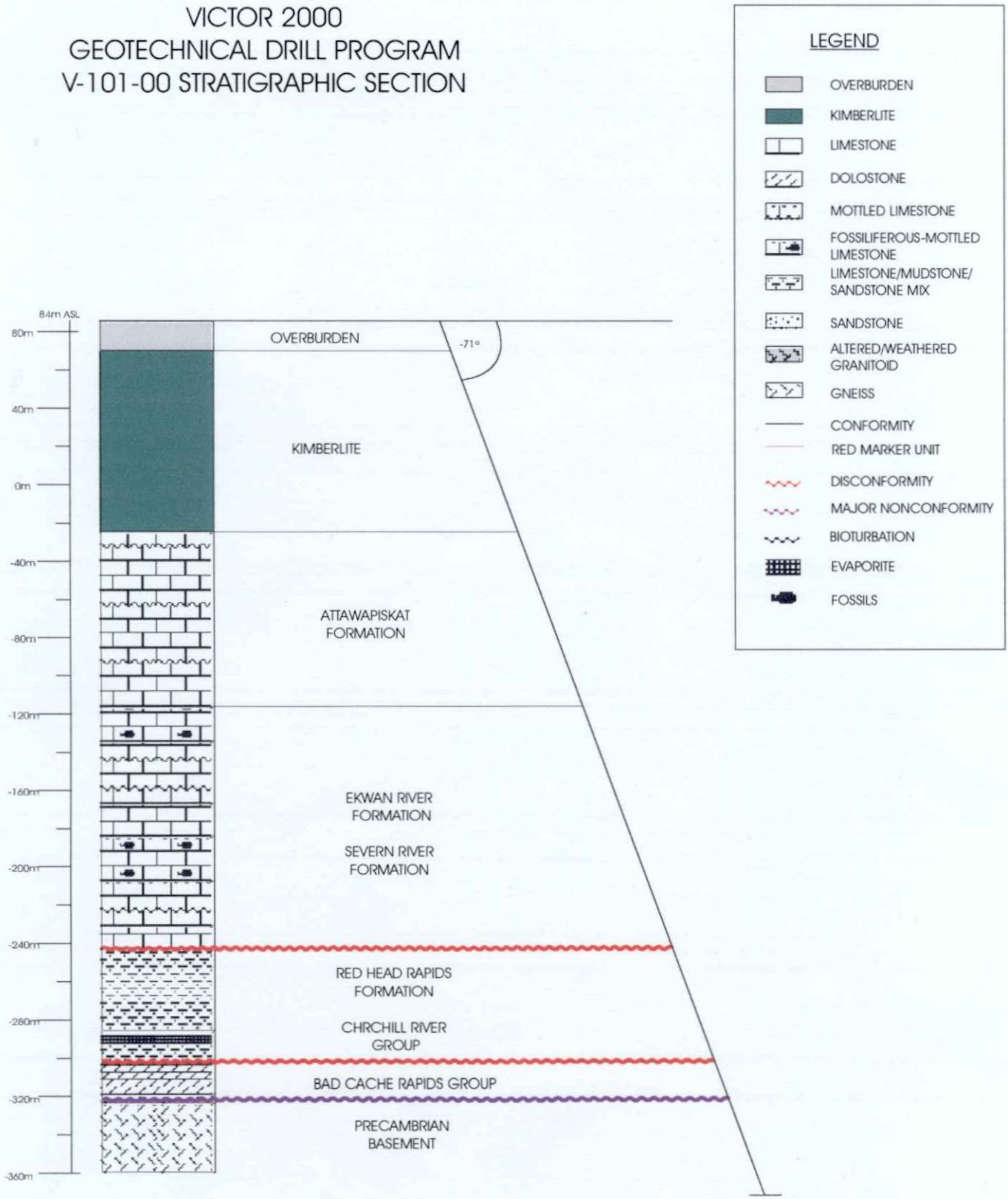
DESCRIPTION (CONTINUED)

		138 C 148m 194 C 234.5 234.5m 438Ma Silurian Ordovician unconformity
144.0	161.2	The rock of this section is borken and will be included as pre-contact sediments. Bedding forms the majority of the breaks. Poor drilling conditions caused this core to be appear more broken than appears in the core box. Therefore this sections strength has been under estimated.
234.5	277.0	**Ordovician** **Red Head Rapids Formation and Churchill River Group** These two groups represent transgressive sequences that terminate in restricted marine environments. Sandstone layers followed by intertidal limestones or dolostone represent transgression. Restricted marine environments are represented by light to dark grey finely bedded mudstones containing beds of gypsum and anhydrite (evaporites). Two red stained graded sandstone to mudstone sequences occur at the top of evaporite units. These units grade from sandstone to mudstone and contain a section of mudstone breccia. These are interpreted as transitional deposits between the restricted marine muds and a new transgressive sequence.
	234.5	438Ma Silurian C Ordovician boundary marked by the end of the Silurian fossilferous mottled limestone and the first occurrence of mudstone.
237.5 250.9	240.5 255.3	Two transitional units - Red stained mudstone grading to sandstone. Transition unit. High susceptibility to weathering. Brecciated grey and red stained mudstone bed
255.3	258.3	Highly stained red sandstone to mudstone bed. This unit correlates between drill holes.
265.0	273.4	Restricted marine unit. Beds of finely bedded light grey and dark grey mudstone inter bedded with thin beds of gypsum and anhydrite.
273.4	277.0	Alternating unit of sandstone and limestone representing the beginning of a transgressive sequence.
277.0	277.05	**Boas River Shale** A thin layer dark brown to black clay at the top of the Bad Cache Rapids dolostone. This layer is thought to be the petroliferous black shale that marks the Silurian-Ordovician unconformity at the top of the Bad Cache Rapids Group. This dark mud that occurs between some borken core is thought to be this bed.
277.0	289.0	**Bad Cache Rapids Group**

DESCRIPTION (CONTINUED)

		Intertidal massive grey dolostone with abundant trace fossils.
289.0	291.1	Basal calcareous quartz sandstone representing the beginning of the transgressive sequence at ~450 Ma. Carbonate weakly consolidates a clean coarse quartz sand.
		PRECAMBRAIN BASEMENT
291.1	292.1	**Altered Granitoid**. Precambrain basement material is altered to red vuggy granitoid. Almost no joints cut this section. Those that do are attributed to isostatic rebound. This unit is a 450 Ma erosion surface.
292.1	327.0	**Gneiss**. Well-defined compositional bands of quartz biotite and feldspar occur in this competent section of basement rock. Jointing in this unit is dominantly horizontal related to Isostatic rebound
	327.0	EOH.

VICTOR 2000
GEOTECHNICAL DRILL PROGRAM
V-101-00 STRATIGRAPHIC SECTION



MONOPROS LIMITED
VICTOR 2000 KIMBERLITE PROJECT
GEOLOGICAL DRILL HOLE LOGS

HOLE NUMBER: V-111-00	Page 1 of 4

DATE STARTED:	04 March 2000
DATE COMPLETED:	08 March 2000
COLLAR LOCATION:	5855959 N 305641 E
NTS SHEET:	43B/13
ANOMALY NUMBER:	V
DIP ANGLE AT 0 m:	45°
AZIMUTH:	220°
DRILL TYPE:	LF-70
CONTRACTOR:	Boart Longyear
DRILL BIT:	HQ
CORE DIAMETER:	63.5mm
FINAL DEPTH:	324.0 m
LOGGED BY:	DE/DO/JB
COMMENTS:	

SUMMARY

FROM	TO	DESCRIPTION
11.4	11.4	Overburden
179.7	179.7	Kimberlite
243.0	243.0	**Ekwan/Severn River Formations** C Reef to Inter-reef sediments
252.0	252.0	Kimberlite
266.2	266.2	**Red Head Rapids Formation and Churchill River Group** C Transgressive-Restricted marine mudstones sandstones and evaporites
284.0	284.0	
299.2	299.2	Kimberlite
309.6	309.6	**Red Head Rapids Formation and Churchill River Group** C Transgressive-Restricted marine mudstones sandstones and evaporites
311.3	311.3	
312.3	312.3	**Bad Cache Rapids Group** - Massive Inter- tidal dolostone
	346.0	**Bad Cache Rapids Group** C Transgressive basal sandstone
	346.0	Altered Granitoid
		Gneiss
		EOH

DESCRIPTION

FROM	TO	DESCRIPTION
0	11.4	Overburden
11.4	179.7	Kimbelite To be Logged by BHSS/CMH The kimberlite is solid with 100% recoverys and rock quallities. Few fractures cut the core of those that do they are subvertical. A few joints appear to be related to isostatic rebound.

DESCRIPTION (CONTINUED)

82.0	93.0	A section of broken core within the kimberlite was observed. Water staining was also observed.
178.0	179.7	Contact kimberlite section. Kimberlie appears weathered in this section. The kimberlite is classified as a breccia with sedimentary xenoliths making up approximately 40-60% of the core. The lower contact with the Ekwan/Severn River Formation was competent and sharp.
179.7	**243.0**	**Ekwan River Severn River Formations** These formations represent inter-reef to near-reef environments comprised of alternating beds of finely laminated limestone, minor interbedded mudstone, microkarst limestone, cherty limestone and fossiliferous mottled limestone. Bedding is flat lying within this unit Finely laminated limestones are white grey to pale brown and tan in colour. Comprised almost entirely of silt size calcareous material. Very fine beds are visible and have been measured to be flat lying. Cherty Limestones are light brown to pale brown in colour and are commonly fossiliferous. Microkarst limestone and carbonate units vary from vuggy light brown to tan limestone to a grey brown fossiliferous carbonate. Both units are fossiliferous. The carbonate unit is relatively porous. These units seem to relate to broken core more so than in hole V-97-00 Mottled limestone is similar in appearance to that seen in the above Attawapiskat Formation. These units are highly fossiliferous and have more distinct colour differences between beds. Beds range in colour from cream yellow to pale brown. One of these fossiliferous mottled limestone units occurs at the base of the Severn River Formation (the 438Ma Silurian-Ordovician boundary) above the Ordovician sediments Mottled Limestone occurrences 183-201m 222-243m Fossiliferous mottled Limestone similar to those seen at the base of the Severn River Formation in all other holes. 243.0m is the approximate location of the 438Ma Silurian Ordovician unconformity. The kimberlite may therefore be intruding as a sill in these sections. This formation was recovered with ~40% borken core. The majority of the breakage was due to bedding plain weaknesses and rare subvertical jointing. Therefore this sections strength has been under estimated.
243.0	**252.0**	**Kimbelite**

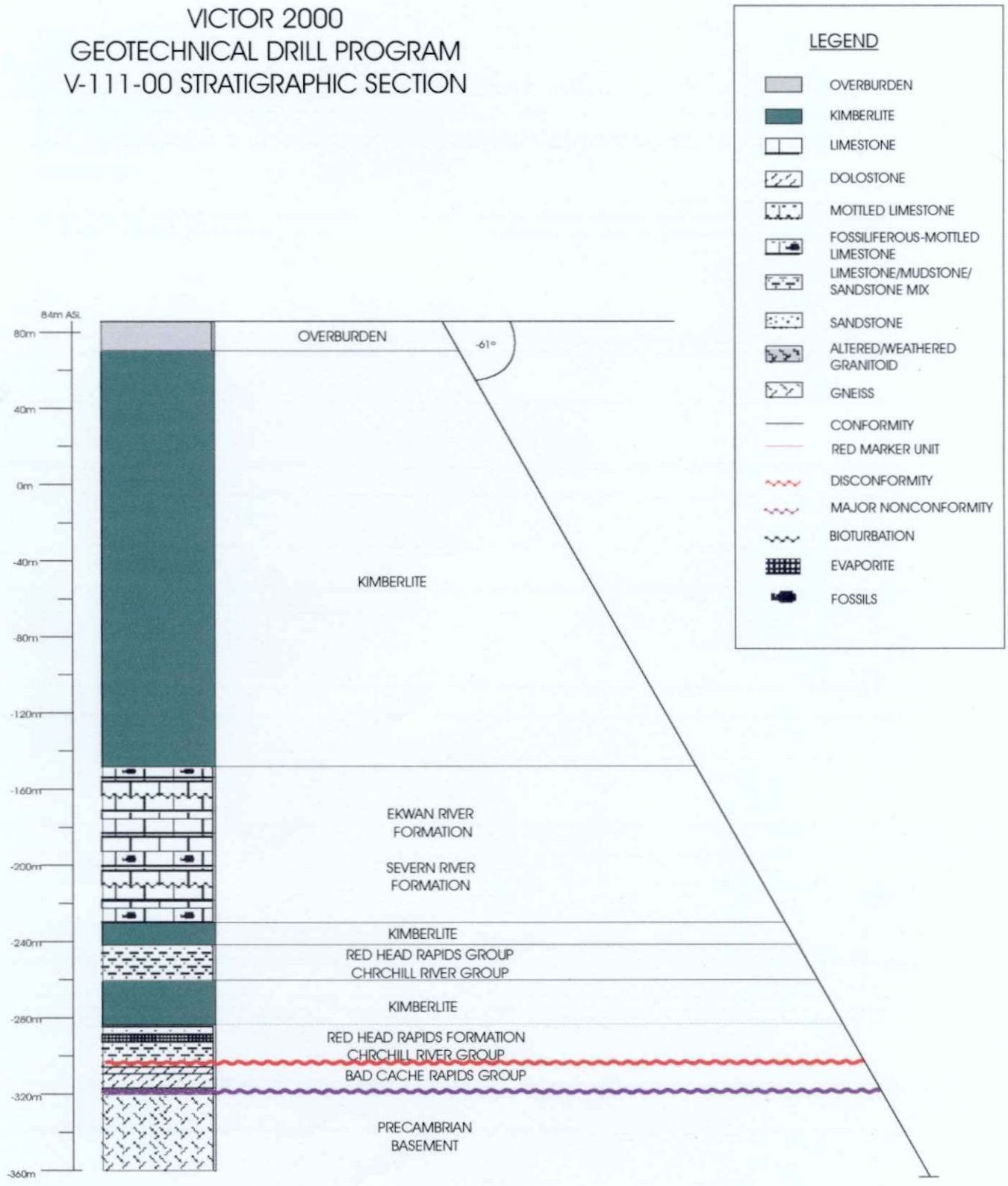
DESCRIPTION (CONTINUED)

		To be Logged by BHSS/CMH The kimberlite recovered in this section is discoloured to a weathered looking brown to rusty red brown. Core recovery was reduced and kimberlie in this section was less competent due to weathering. The kimberlie implacement is thought to be stratigraphicly controled because it has intruded into the Ordovician weaker mudstone units right at the base of the more competent Silurian limestones.
252.0	266.2	**Ordovician** **Red Head Rapids Formation and Churchill River Group** The typical units observed in the other drill holes have been disrupted by kimberlite implacement. It appears that weaker beds within these groups have been intruced by the kimberlie. The red sandstone and mudstone beds, brecciated red and grey mudstone and the red marker bed have all been replaced with kimberlite. It appears that more competent beds of dolostone and limestone remain inplace. The vertical thickness of the Red Head Repids Fromation and Churchill River Group remained ~41m as observed in the other drill holes. This is good evidence showing that the units are insitu and the kimberlite units are sill like intrusions.
266.2	284.0	**Kimbelite** To be Logged by BHSS/CMH The kimberlite recovered in this section is discoloured to a weathered looking brown to rusty red brown. Core recovery was reduced and kimberlie in this section was less competent due to weathering. Again this unit appears to be stratigraphicly controlled. The upper and lower contacts both relate to known stratigraphic contacts. Dolostone and limestone within the kimberlie unit may be insitu.
284.0	299.2	**Red Head Rapids and Churchill River Groups** The evaporite unit and an alternating sandstone to limestone unit at the base of the of the Churchill River Group appears here insitu.
299.2	299.22	**Boas River Shale** A thin layer dark brown to black clay at the top of the Bad Cache Rapids dolostone. This layer is thought to be the petroliferous black shale that marks the Silurian-Ordovician unconformity at the top of the Bad Cache Rapids Group. This bed is represented in this hole by a dark staining and a coating of mud on the bed face at the top of the dolostone bed. It may have been washed away by the drill.
299.2	309.6	**Bad Cache Rapids Group** Intertidal massive grey dolostone. This unit has abundant trace fossils and represents the intertidal muds of the transgressive sequence.

DESCRIPTION (CONTINUED)

309.6	311.3	Basal calcareous quartz sandstone representing the beginning of the transgressive sequence ~ 450 Ma. Calcite weakly consolidates a clean coarse quartz sand.
		PRECAMBRAIN BASEMENT
311.3	**312.3**	**Altered Granitoid**. This section represents a 450 Ma one-metre erosion surface.
312.3	**346.0**	**Gneiss** . This section of core very competent rare subvertical joints and horizontal isostatic rebound joints are observed. A small kimberlite stiringer was observed at ~316m. Compositonal banding becomes well defined with depth.
	346.0	**EOH**

VICTOR 2000
GEOTECHNICAL DRILL PROGRAM
V-111-00 STRATIGRAPHIC SECTION



APPENDIX 2

GEOTECHNICAL DATA

RMR CALCULATION SHEETS

GEOTECHNICAL GRAPHS

UCS GRAPHS

APPENDIX 1
GEOTECHNICAL DATA

V-97-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-97-00	0.0	63.9	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-97-00	63.9	135.0	Afm	42	97.0	4.0	3	65	80	100	100	5	18	21	**44**	**16**	**Fair**	**3B**	**Yellow**
V-97-00	135.0	220.2	EK/SR	38	89.8	3.2	3	65	85	100	100	5	18	22	**45**	**15**	**Fair**	**3B**	**Yellow**
V-97-00	220.2	260.0	RH/CR	18	92.8	1.6	4	60	64	100	100	3	26	15	**44**	**7**	**Fair**	**3B**	**Yellow**
V-97-00	260.0	271.5	BCR	71	100.0	1.2	4	60	64	100	100	8	29	15	**52**	**32**	**Fair**	**3A**	**Yellow**
V-97-00	271.5	273.4	SS	10	100.0	0.0	4	60	67	100	100	2	1	16	**20**	**2**	**V.Poor**	**5A**	**Red**
V-97-00	273.4	277.0	Ga	41	82.2	2.1	3	64	81	100	100	5	24	21	**50**	**18**	**Fair**	**3B**	**Yellow**
V-97-00	277.0	282.0	Gn	168	100.0	1.0	3	64	81	100	100	17	29	21	**67**	**84**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-97-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-97-00	0.0	63.9	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-97-00	63.9	135.0	Afm	42	97.0	4.0	3	65	80	100	100	5	18	21	**44**	**16**	**Fair**	**3B**	**Yellow**
V-97-00	135.0	220.2	EK/SR	38	89.8	3.2	3	65	85	100	100	5	18	22	**45**	**15**	**Fair**	**3B**	**Yellow**
V-97-00	220.2	260.0	RH/CR	18	92.8	1.6	4	60	64	100	100	3	26	15	**44**	**7**	**Fair**	**3B**	**Yellow**
V-97-00	260.0	271.5	BCR	71	100.0	1.2	4	60	64	100	100	8	29	15	**52**	**32**	**Fair**	**3A**	**Yellow**
V-97-00	271.5	273.4	SS	10	100.0	0.0	4	60	67	100	100	2	1	16	**20**	**2**	**V.Poor**	**5A**	**Red**
V-97-00	273.4	277.0	Ga	41	82.2	2.1	3	64	81	100	100	5	24	21	**50**	**18**	**Fair**	**3B**	**Yellow**
V-97-00	277.0	282.0	Gn	168	100.0	1.0	3	64	81	100	100	17	29	21	**67**	**84**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-97-00	0.0	63.9	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-97-00	63.9	135.0	Afm	42	97.0	2.0	3	65	80	100	100	5	26	21	**52**	**20**	**Fair**	**3A**	**Yellow**
V-97-00	135.0	220.2	EK/SR	38	89.8	0.9	3	65	85	100	100	5	31	22	**58**	**20**	**Fair**	**3A**	**Yellow**
V-97-00	220.2	260.0	RH/CR	18	92.8	2.7	4	60	65	100	100	3	26	16	**45**	**7**	**Fair**	**3B**	**Yellow**
V-97-00	260.0	271.5	BCR	71	100.0	0.5	4	60	65	100	100	8	38	16	**61**	**38**	**Good**	**2B**	**Green**
V-97-00	271.5	273.4	SS	10	100.0	0.0	4	60	65	100	100	2	1	16	**19**	**2**	**V.Poor**	**5A**	**Red**
V-97-00	273.4	277.0	Ga	41	82.2	0.5	3	65	80	100	100	5	38	21	**64**	**24**	**Good**	**2B**	**Green**
V-97-00	277.0	282.0	Gn	168	100.0	0.0	2	70	85	100	100	17	40	24	**81**	**107**	**V.Good**	**1B**	**.Blue**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-97-00	0.0	63.9	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-97-00	63.9	135.0	Afm	42	97.0	2.0	3	65	80	100	100	5	26	21	**52**	**20**	**Fair**	**3A**	**Yellow**
V-97-00	135.0	220.2	EK/SR	38	89.8	0.9	3	65	85	100	100	5	31	22	**58**	**20**	**Fair**	**3A**	**Yellow**
V-97-00	220.2	260.0	RH/CR	18	92.8	2.7	4	60	65	100	100	3	26	16	**45**	**7**	**Fair**	**3B**	**Yellow**
V-97-00	260.0	271.5	BCR	71	100.0	0.5	4	60	65	100	100	8	38	16	**61**	**38**	**Good**	**2B**	**Green**
V-97-00	271.5	273.4	SS	10	100.0	0.0	4	60	65	100	100	2	1	16	**19**	**2**	**V.Poor**	**5A**	**Red**
V-97-00	273.4	277.0	Ga	41	82.2	0.5	3	65	80	100	100	5	38	21	**64**	**24**	**Good**	**2B**	**Green**
V-97-00	277.0	282.0	Gn	168	100.0	0.0	2	70	85	100	100	17	40	24	**81**	**107**	**V.Good**	**1B**	**.Blue**

APPENDIX 1
GEOTECHNICAL DATA

V-98-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-98-00	0.0	39.5	OVB	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
V-98-00	39.5	151.3	Afm	42	84.9	2.4	3	65	80	100	100	5	21	21	**47**	**18**	**Fair**	**3B**	**Yellow**
V-98-00	151.5	242.7	EK/SR	38	93.8	6.5	3	65	85	100	100	5	15	22	**42**	**14**	**Fair**	**3B**	**Yellow**
V-98-00	242.7	288.5	RH/CR	18	93.9	6.2	4	60	64	100	100	3	18	15	**36**	**6**	**Poor**	**4A**	**Brown**
V-98-00	288.5	300.8	BCR	71	100.0	2.9	4	60	64	100	100	8	24	15	**47**	**28**	**Fair**	**3B**	**Yellow**
V-98-00	300.8	303.0	SS	10	100.0	8.9	4	60	67	100	100	2	13	16	**32**	**3**	**Poor**	**4A**	**Brown**
V-98-00	303.0	305.4	Ga	41	100.0	0.0	3	63	82	100	100	5	40	21	**66**	**25**	**Good**	**2B**	**Green**
V-98-00	305.4	312.0	Gn	168	80.3	4.6	2	70	89	100	100	17	18	25	**60**	**72**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-98-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-98-00	0.0	39.5	OVB	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
V-98-00	39.5	151.3	Afm	42	84.9	2.4	3	65	80	100	100	5	21	21	**47**	**18**	**Fair**	**3B**	**Yellow**
V-98-00	151.5	242.7	EK/SR	38	93.8	6.5	3	65	85	100	100	5	15	22	**42**	**14**	**Fair**	**3B**	**Yellow**
V-98-00	242.7	288.5	RH/CR	18	93.9	6.2	4	60	64	100	100	3	18	15	**36**	**6**	**Poor**	**4A**	**Brown**
V-98-00	288.5	300.8	BCR	71	100.0	2.9	4	60	64	100	100	8	24	15	**47**	**28**	**Fair**	**3B**	**Yellow**
V-98-00	300.8	303.0	SS	10	100.0	8.9	4	60	67	100	100	2	13	16	**32**	**3**	**Poor**	**4A**	**Brown**
V-98-00	303.0	305.4	Ga	41	100.0	0.0	3	63	82	100	100	5	40	21	**66**	**25**	**Good**	**2B**	**Green**
V-98-00	305.4	312.0	Gn	168	80.3	4.6	2	70	89	100	100	17	18	25	**60**	**72**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-98-00	0.0	39.5	OVB	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
V-98-00	39.5	151.3	Afm	42	84.9	2.4	3	65	80	100	100	5	21	21	**47**	**18**	**Fair**	**3B**	**Yellow**
V-98-00	151.5	242.7	EK/SR	38	93.8	6.5	3	65	85	100	100	5	15	22	**42**	**14**	**Fair**	**3B**	**Yellow**
V-98-00	242.7	288.5	RH/CR	18	93.9	6.2	4	60	64	100	100	3	18	15	**36**	**6**	**Poor**	**4A**	**Brown**
V-98-00	288.5	300.8	BCR	71	100.0	2.9	4	60	64	100	100	8	24	15	**47**	**28**	**Fair**	**3B**	**Yellow**
V-98-00	300.8	303.0	SS	10	100.0	8.9	4	60	67	100	100	2	13	16	**32**	**3**	**Poor**	**4A**	**Brown**
V-98-00	303.0	305.4	Ga	41	100.0	0.0	3	63	82	100	100	5	40	21	**66**	**25**	**Good**	**2B**	**Green**
V-98-00	305.4	312.0	Gn	168	80.3	4.6	2	70	89	100	100	17	18	25	**60**	**72**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-98-00	0.0	39.5	OVB	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
V-98-00	39.5	151.3	Afm	42	84.9	2.4	3	65	80	100	100	5	21	21	**47**	**18**	**Fair**	**3B**	**Yellow**
V-98-00	151.5	242.7	EK/SR	38	93.8	6.5	3	65	85	100	100	5	15	22	**42**	**14**	**Fair**	**3B**	**Yellow**
V-98-00	242.7	288.5	RH/CR	18	93.9	6.2	4	60	64	100	100	3	18	15	**36**	**6**	**Poor**	**4A**	**Brown**
V-98-00	288.5	300.8	BCR	71	100.0	2.9	4	60	64	100	100	8	24	15	**47**	**28**	**Fair**	**3B**	**Yellow**
V-98-00	300.8	303.0	SS	10	100.0	8.9	4	60	67	100	100	2	13	16	**32**	**3**	**Poor**	**4A**	**Brown**
V-98-00	303.0	305.4	Ga	41	100.0	0.0	3	63	82	100	100	5	40	21	**66**	**25**	**Good**	**2B**	**Green**
V-98-00	305.4	312.0	Gn	168	80.3	4.6	2	70	89	100	100	17	18	25	**60**	**72**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-99-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-99-00	0.0	14.6	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-99-00	14.6	148.9	Afm	56	80.9	8.9	3	65	85	100	100	6	12	22	**40**	**19**	**Fair**	**3B**	**Yellow**
V-99-00	148.9	246.5	EK/SR	38	82.1	11.8	3	65	68	100	100	5	10	18	**32**	**10**	**Poor**	**4A**	**Brown**
V-99-00	246.5	293.8	RH/CR	18	99.6	6.2	4	62	71	100	100	3	15	18	**36**	**6**	**Poor**	**4A**	**Brown**
V-99-00	293.8	305.8	BCR	71	98.7	0.6	4	60	73	100	100	8	34	18	**59**	**37**	**Fair**	**3A**	**Yellow**
V-99-00	305.8	309.0	SS	10	100.0	2.1	4	60	80	100	100	2	10	19	**32**	**3**	**Poor**	**4A**	**Brown**
V-99-00	309.0	310.3	Ga	41	100.0	2.9	3	68	85	100	100	5	24	23	**52**	**19**	**Fair**	**3A**	**Yellow**
V-99-00	310.3	317.5	Gn	168	100.0	2.6	2	70	88	100	100	17	24	25	**66**	**81**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-99-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-99-00	0.0	14.6	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-99-00	14.6	148.9	Afm	56	80.9	8.9	3	65	85	100	100	6	12	22	**40**	**19**	**Fair**	**3B**	**Yellow**
V-99-00	148.9	246.5	EK/SR	38	82.1	11.8	3	65	68	100	100	5	10	18	**32**	**10**	**Poor**	**4A**	**Brown**
V-99-00	246.5	293.8	RH/CR	18	99.6	6.2	4	62	71	100	100	3	15	18	**36**	**6**	**Poor**	**4A**	**Brown**
V-99-00	293.8	305.8	BCR	71	98.7	0.6	4	60	73	100	100	8	34	18	**59**	**37**	**Fair**	**3A**	**Yellow**
V-99-00	305.8	309.0	SS	10	100.0	2.1	4	60	80	100	100	2	10	19	**32**	**3**	**Poor**	**4A**	**Brown**
V-99-00	309.0	310.3	Ga	41	100.0	2.9	3	68	85	100	100	5	24	23	**52**	**19**	**Fair**	**3A**	**Yellow**
V-99-00	310.3	317.5	Gn	168	100.0	2.6	2	70	88	100	100	17	24	25	**66**	**81**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-99-00	0.0	14.6	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-99-00	14.6	148.9	Afm	56	80.9	2.9	3	65	85	100	100	6	21	22	**49**	**24**	**Fair**	**3B**	**Yellow**
V-99-00	148.9	246.5	EK/SR	38	82.1	2.9	3	65	68	100	100	5	21	18	**43**	**14**	**Fair**	**3B**	**Yellow**
V-99-00	246.5	293.8	RH/CR	18	99.6	0.7	4	63	73	100	100	3	34	18	**55**	**9**	**Fair**	**3A**	**Yellow**
V-99-00	293.8	305.8	BCR	71	98.7	0.7	4	60	80	100	100	8	36	19	**63**	**39**	**Good**	**2B**	**Green**
V-99-00	305.8	309.0	SS	10	100.0	0.0	4	60	80	100	100	2	1	19	**23**	**2**	**Poor**	**4B**	**Brown**
V-99-00	309.0	310.3	Ga	41	100.0	0.7	3	65	80	100	100	5	36	21	**62**	**23**	**Good**	**2B**	**Green**
V-99-00	310.3	317.5	Gn	168	100.0	0.7	2	70	85	100	100	17	36	24	**77**	**100**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-99-00	0.0	14.6	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-99-00	14.6	148.9	Afm	56	80.9	2.9	3	65	85	100	100	6	21	22	**49**	**24**	**Fair**	**3B**	**Yellow**
V-99-00	148.9	246.5	EK/SR	38	82.1	2.9	3	65	68	100	100	5	21	18	**43**	**14**	**Fair**	**3B**	**Yellow**
V-99-00	246.5	293.8	RH/CR	18	99.6	0.7	4	63	73	100	100	3	34	18	**55**	**9**	**Fair**	**3A**	**Yellow**
V-99-00	293.8	305.8	BCR	71	98.7	0.7	4	60	80	100	100	8	36	19	**63**	**39**	**Good**	**2B**	**Green**
V-99-00	305.8	309.0	SS	10	100.0	0.0	4	60	80	100	100	2	1	19	**23**	**2**	**Poor**	**4B**	**Brown**
V-99-00	309.0	310.3	Ga	41	100.0	0.7	3	65	80	100	100	5	36	21	**62**	**23**	**Good**	**2B**	**Green**
V-99-00	310.3	317.5	Gn	168	100.0	0.7	2	70	85	100	100	17	36	24	**77**	**100**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-100-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-100-00	0.0	35.7	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-100-00	35.7	127.9	Afm	42	84.2	7.7	3	67	82	100	100	5	12	22	**39**	**14**	**Poor**	**4A**	**Brown**
V-100-00	127.9	283.5	KIMBERLITE	50	99.6	0.6	3	70	89	100	81	6	34	20	**60**	**27**	**Fair**	**3A**	**Yellow**
V-100-00	283.5	299.0	RH/CR	18	100.0	3.7	4	60	73	100	100	3	21	17	**41**	**7**	**Fair**	**3B**	**Yellow**
V-100-00	299.0	311.6	BCR	71	97.2	1.3	4	60	70	100	100	8	29	17	**53**	**33**	**Fair**	**3A**	**Yellow**
V-100-00	311.6	313.8	SS	10	100.0	2.9	4	60	77	100	100	2	10	18	**31**	**3**	**Poor**	**4A**	**Brown**
V-100-00	313.8	316.0	Ga	41	100.0	1.8	2	70	88	100	100	5	26	25	**55**	**21**	**Fair**	**3A**	**Yellow**
V-100-00	316.0	327.0	Gn	168	81.1	1.7	2	70	88	100	100	17	26	25	**68**	**85**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-100-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH	FROM	TO	Code	AVG		AVG	average adjustments					IRS	FF	JC			CRIP	GORY	OUR
ID	m	m		MPa	%	1/m	water	large	small	alt	fill	rating	rating	rating	rating	MPa	TION		
V-100-00	0.0	35.7	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-100-00	35.7	127.9	Afm	42	84.2	7.7	3	67	82	100	100	5	12	22	**39**	**14**	**Poor**	**4A**	**Brown**
V-100-00	127.9	283.5	KIMBERLITE	50	99.6	0.6	3	70	89	100	81	6	34	20	**60**	**27**	**Fair**	**3A**	**Yellow**
V-100-00	283.5	299.0	RH/CR	18	100.0	3.7	4	60	73	100	100	3	21	17	**41**	**7**	**Fair**	**3B**	**Yellow**
V-100-00	299.0	311.6	BCR	71	97.2	1.3	4	60	70	100	100	8	29	17	**53**	**33**	**Fair**	**3A**	**Yellow**
V-100-00	311.6	313.8	SS	10	100.0	2.9	4	60	77	100	100	2	10	18	**31**	**3**	**Poor**	**4A**	**Brown**
V-100-00	313.8	316.0	Ga	41	100.0	1.8	2	70	88	100	100	5	26	25	**55**	**21**	**Fair**	**3A**	**Yellow**
V-100-00	316.0	327.0	Gn	168	81.1	1.7	2	70	88	100	100	17	26	25	**68**	**85**	**Good**	**2B**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments					IRS	FF	JC			CRIP	GORY	OUR
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	rating	rating	rating	rating	MPa	TION		
V-100-00	0.0	35.7	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-100-00	35.7	127.9	Afm	42	84.2	0.7	3	67	82	100	100	5	31	22	**58**	**22**	**Fair**	**3A**	**Yellow**
V-100-00	127.9	283.5	KIMBERLITE	50	99.6	0.6	2	70	90	100	80	6	36	20	**62**	**28**	**Good**	**2B**	**Green**
V-100-00	283.5	299.0	RH/CR	18	100.0	0.7	4	60	75	100	100	3	36	18	**57**	**9**	**Fair**	**3A**	**Yellow**
V-100-00	299.0	311.6	BCR	71	97.2	0.7	4	60	75	100	100	8	36	18	**62**	**38**	**Good**	**2B**	**Green**
V-100-00	311.6	313.8	SS	10	100.0	2.2	4	60	75	100	100	2	10	18	**30**	**3**	**Poor**	**4A**	**Brown**
V-100-00	313.8	316.0	Ga	41	100.0	1.8	2	70	85	100	100	5	29	24	**58**	**22**	**Fair**	**3A**	**Yellow**
V-100-00	316.0	327.0	Gn	168	81.1	1.7	2	70	85	100	100	17	29	24	**70**	**89**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH	FROM	TO	Code	AVG		AVG	average adjustments					IRS	FF	JC			CRIP	GORY	OUR
ID	m	m		MPa	%	1/m	water	large	small	alt	fill	rating	rating	rating	rating	MPa	TION		
V-100-00	0.0	35.7	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-100-00	35.7	127.9	Afm	42	84.2	0.7	3	67	82	100	100	5	31	22	**58**	**22**	**Fair**	**3A**	**Yellow**
V-100-00	127.9	283.5	KIMBERLITE	50	99.6	0.6	2	70	90	100	80	6	36	20	**62**	**28**	**Good**	**2B**	**Green**
V-100-00	283.5	299.0	RH/CR	18	100.0	0.7	4	60	75	100	100	3	36	18	**57**	**9**	**Fair**	**3A**	**Yellow**
V-100-00	299.0	311.6	BCR	71	97.2	0.7	4	60	75	100	100	8	36	18	**62**	**38**	**Good**	**2B**	**Green**
V-100-00	311.6	313.8	SS	10	100.0	2.2	4	60	75	100	100	2	10	18	**30**	**3**	**Poor**	**4A**	**Brown**
V-100-00	313.8	316.0	Ga	41	100.0	1.8	2	70	85	100	100	5	29	24	**58**	**22**	**Fair**	**3A**	**Yellow**
V-100-00	316.0	327.0	Gn	168	81.1	1.7	2	70	85	100	100	17	29	24	**70**	**89**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-101-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-101-00	0.0	10.8	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-101-00	10.8	78.4	Kimberlite	50	99.1	1.3	3	65	85	100	77	6	29	17	**52**	**23**	**Fair**	**3A**	**Yellow**
V-101-00	78.4	136.0	Afm	56	54.6	5.5	3	65	80	100	100	6	18	21	**45**	**22**	**Fair**	**3B**	**Yellow**
V-101-00	136.0	234.5	EK/SR	38	81.7	7.7	3	65	84	100	100	5	15	22	**41**	**14**	**Fair**	**3B**	**Yellow**
V-101-00	234.5	277.0	RH/CR	18	98.3	6.1	4	65	55	100	100	3	18	14	**35**	**6**	**Poor**	**4A**	**Brown**
V-101-00	277.0	288.3	BCR	71	100.0	2.1	4	64	79	100	100	8	24	20	**52**	**31**	**Fair**	**3A**	**Yellow**
V-101-00	288.3	291.1	SS	10	95.1	1.4	4	64	84	100	100	2	8	21	**32**	**3**	**Poor**	**4A**	**Brown**
V-101-00	291.1	292.1	Ga	41	100.0	0.5	3	67	84	100	100	5	36	23	**63**	**24**	**Good**	**2B**	**Green**
V-101-00	292.1	300.0	Gn	168	100.0	0.6	3	67	84	100	100	17	34	23	**74**	**95**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-101-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-101-00	0.0	10.8	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-101-00	10.8	78.4	Kimberlite	50	99.1	1.3	3	65	85	100	77	6	29	17	**52**	**23**	**Fair**	**3A**	**Yellow**
V-101-00	78.4	136.0	Afm	56	54.6	5.5	3	65	80	100	100	6	18	21	**45**	**22**	**Fair**	**3B**	**Yellow**
V-101-00	136.0	234.5	EK/SR	38	81.7	7.7	3	65	84	100	100	5	15	22	**41**	**14**	**Fair**	**3B**	**Yellow**
V-101-00	234.5	277.0	RH/CR	18	98.3	6.1	4	65	55	100	100	3	18	14	**35**	**6**	**Poor**	**4A**	**Brown**
V-101-00	277.0	288.3	BCR	71	100.0	2.1	4	64	79	100	100	8	24	20	**52**	**31**	**Fair**	**3A**	**Yellow**
V-101-00	288.3	291.1	SS	10	95.1	1.4	4	64	84	100	100	2	8	21	**32**	**3**	**Poor**	**4A**	**Brown**
V-101-00	291.1	292.1	Ga	41	100.0	0.5	3	67	84	100	100	5	36	23	**63**	**24**	**Good**	**2B**	**Green**
V-101-00	292.1	300.0	Gn	168	100.0	0.6	3	67	84	100	100	17	34	23	**74**	**95**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments					IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
							water	large	small	alt	fill								
V-101-00	0.0	10.8	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-101-00	10.8	78.4	Kimberlite	50	99.1	1.3	3	65	85	100	75	6	31	17	**53**	**24**	**Fair**	**3A**	**Yellow**
V-101-00	78.4	136.0	Afm	56	54.6	1.4	3	65	80	100	100	6	31	21	**58**	**29**	**Fair**	**3A**	**Yellow**
V-101-00	136.0	234.5	EK/SR	38	81.7	1.4	3	65	85	100	100	5	31	22	**58**	**20**	**Fair**	**3A**	**Yellow**
V-101-00	234.5	277.0	RH/CR	18	98.3	0.7	3	65	55	100	100	3	36	14	**53**	**9**	**Fair**	**3A**	**Yellow**
V-101-00	277.0	288.3	BCR	71	100.0	0.7	3	65	85	100	100	8	36	22	**66**	**41**	**Good**	**2B**	**Green**
V-101-00	288.3	291.1	SS	10	95.1	0.7	3	65	85	100	100	2	6	22	**30**	**3**	**Poor**	**4A**	**Brown**
V-101-00	291.1	292.1	Ga	41	100.0	0.5	3	65	80	100	100	5	38	21	**64**	**24**	**Good**	**2B**	**Green**
V-101-00	292.1	300.0	Gn	168	100.0	0.6	3	65	80	100	100	17	36	21	**74**	**95**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
							average adjustments												
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-101-00	0.0	10.8	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-101-00	10.8	78.4	Kimberlite	50	99.1	1.3	3	65	85	100	75	6	31	17	**53**	**24**	**Fair**	**3A**	**Yellow**
V-101-00	78.4	136.0	Afm	56	54.6	1.4	3	65	80	100	100	6	31	21	**58**	**29**	**Fair**	**3A**	**Yellow**
V-101-00	136.0	234.5	EK/SR	38	81.7	1.4	3	65	85	100	100	5	31	22	**58**	**20**	**Fair**	**3A**	**Yellow**
V-101-00	234.5	277.0	RH/CR	18	98.3	0.7	3	65	55	100	100	3	36	14	**53**	**9**	**Fair**	**3A**	**Yellow**
V-101-00	277.0	288.3	BCR	71	100.0	0.7	3	65	85	100	100	8	36	22	**66**	**41**	**Good**	**2B**	**Green**
V-101-00	288.3	291.1	SS	10	95.1	0.7	3	65	85	100	100	2	6	22	**30**	**3**	**Poor**	**4A**	**Brown**
V-101-00	291.1	292.1	Ga	41	100.0	0.5	3	65	80	100	100	5	38	21	**64**	**24**	**Good**	**2B**	**Green**
V-101-00	292.1	300.0	Gn	168	100.0	0.6	3	65	80	100	100	17	36	21	**74**	**95**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-111-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH	FROM	TO	Code	AVG		AVG	average adjustments					IRS	FF	JC			CRIP	GORY	OUR
ID	m	m		MPa	%	1/m	water	large	small	alt	fill	rating	rating	rating	rating	MPa	TION		
V-111-00	0.0	11.4	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-111-00	11.4	179.7	KIMBERLITE	50	100.0	5.2	3	66	86	100	100	6	18	23	**46**	**20**	**Fair**	**3B**	**Yellow**
V-111-00	179.7	244.0	EK/SR	38	69.1	2.9	3	65	84	100	100	5	24	22	**50**	**17**	**Fair**	**3A**	**Yellow**
V-111-00	244.0	252.0	KIMBERLITE	26	98.8	6.4	3	62	82	100	100	4	18	20	**42**	**10**	**Fair**	**3B**	**Yellow**
V-111-00	252.0	266.2	RH/CR	30	95.4	0.8	4	60	50	100	100	4	34	12	**50**	**14**	**Fair**	**3B**	**Yellow**
V-111-00	266.2	273.0	KIMBERLITE	12	94.4	3.4	3	62	82	100	100	3	21	20	**44**	**5**	**Fair**	**3B**	**Yellow**
V-111-00	273.0	281.7	RH/CR	30	98.0	5.7	4	60	50	100	100	4	18	12	**34**	**9**	**Poor**	**4A**	**Brown**
V-111-00	281.7	309.6	BCR	71	89.8	2.1	4	60	75	100	100	8	24	18	**50**	**30**	**Fair**	**3B**	**Yellow**
V-111-00	309.6	311.1	SS	10	100.0	0.0	4	60	69	100	100	2	1	17	**20**	**2**	**V.Poor**	**5A**	**Red**
V-111-00	311.3	312.3	Ga	41	100.0	1.2	3	67	84	100	100	5	29	23	**56**	**21**	**Fair**	**3A**	**Yellow**
V-111-00	312.3	346.0	Gn	168	98.5	0.7	2	70	88	100	100	17	34	25	**76**	**98**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

V-111-00 BEDDING INCLUDED

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-111-00	0.0	11.4	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-111-00	11.4	179.7	KIMBERLITE	50	100.0	5.2	3	66	86	100	100	6	18	23	**46**	**20**	**Fair**	**3B**	**Yellow**
V-111-00	179.7	244.0	EK/SR	38	69.1	2.9	3	65	84	100	100	5	24	22	**50**	**17**	**Fair**	**3A**	**Yellow**
V-111-00	244.0	252.0	KIMBERLITE	26	98.8	6.4	3	62	82	100	100	4	18	20	**42**	**10**	**Fair**	**3B**	**Yellow**
V-111-00	252.0	266.2	RH/CR	30	95.4	0.8	4	60	50	100	100	4	34	12	**50**	**14**	**Fair**	**3B**	**Yellow**
V-111-00	266.2	273.0	KIMBERLITE	12	94.4	3.4	3	62	82	100	100	3	21	20	**44**	**5**	**Fair**	**3B**	**Yellow**
V-111-00	273.0	281.7	RH/CR	30	98.0	5.7	4	60	50	100	100	4	18	12	**34**	**9**	**Poor**	**4A**	**Brown**
V-111-00	281.7	309.6	BCR	71	89.8	2.1	4	60	75	100	100	8	24	18	**50**	**30**	**Fair**	**3B**	**Yellow**
V-111-00	309.6	311.1	SS	10	100.0	0.0	4	60	69	100	100	2	1	17	**20**	**2**	**V.Poor**	**5A**	**Red**
V-111-00	311.3	312.3	Ga	41	100.0	1.2	3	67	84	100	100	5	29	23	**56**	**21**	**Fair**	**3A**	**Yellow**
V-111-00	312.3	346.0	Gn	168	98.5	0.7	2	70	88	100	100	17	34	25	**76**	**98**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

GEOTECHNICAL LOGGING/MAPPING - OUTPUT

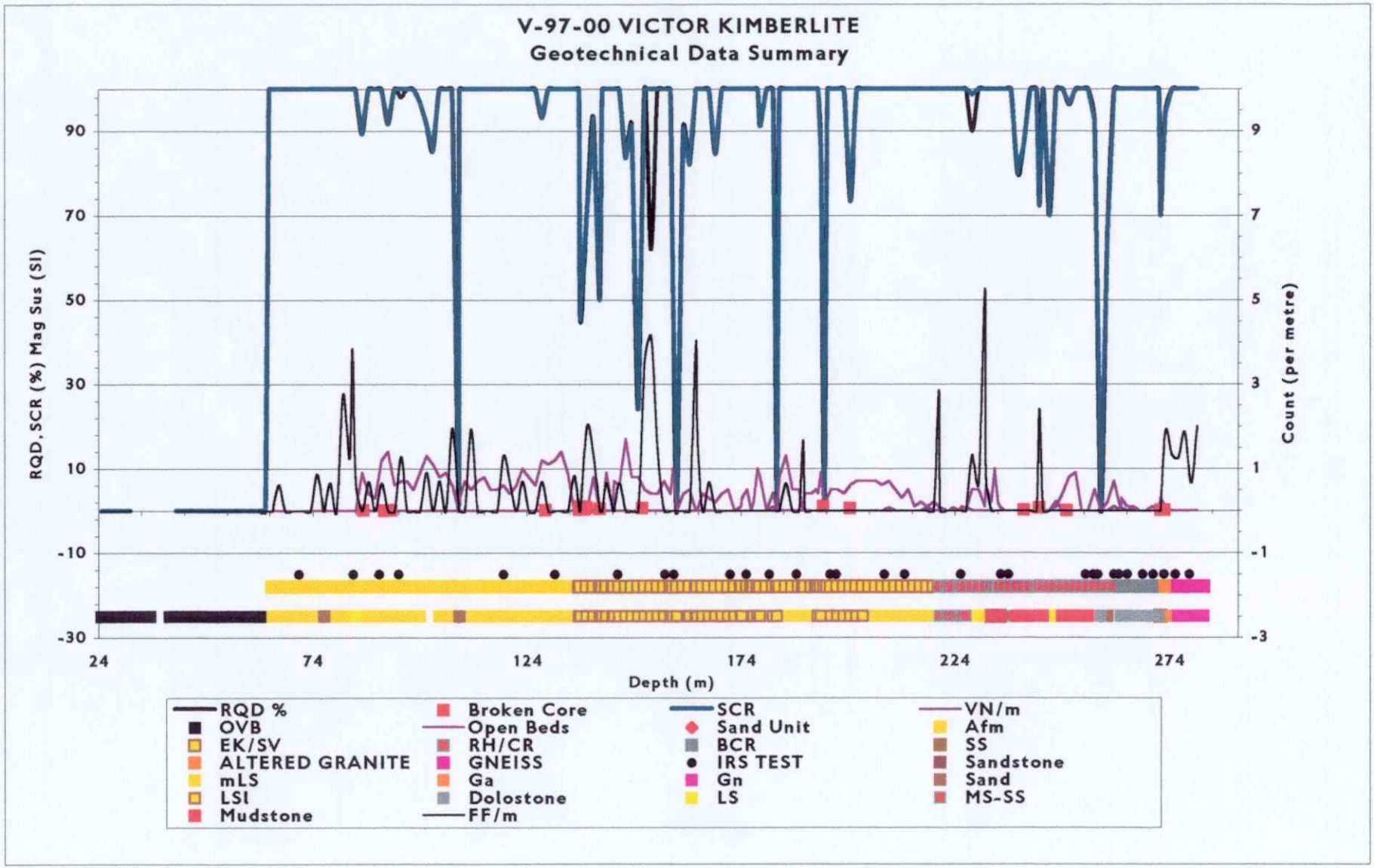
LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH ID	FROM m	TO m	Code	AVG MPa	%	AVG 1/m	average adjustments water	large	small	alt	fill	IRS rating	FF rating	JC rating	rating	MPa	CRIP TION	GORY	OUR
V-111-00	0.0	11.4	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-111-00	11.4	179.7	KIMBERLITE	50	100.0	0.7	3	65	85	100	100	6	36	22	**64**	**29**	**Good**	**2B**	**Green**
V-111-00	179.7	244.0	EK/SR	38	69.1	2.9	3	65	85	100	100	5	26	22	**53**	**18**	**Fair**	**3A**	**Yellow**
V-111-00	244.0	252.0	KIMBERLITE	26	98.8	0.2	4	60	80	100	100	4	40	19	**63**	**15**	**Good**	**2B**	**Green**
V-111-00	252.0	266.2	RH/CR	30	95.4	0.4	4	60	50	100	100	4	38	12	**54**	**15**	**Fair**	**3A**	**Yellow**
V-111-00	266.2	273.0	KIMBERLITE	12	94.4	0.1	4	60	80	100	100	3	40	19	**62**	**7**	**Good**	**2B**	**Green**
V-111-00	273.0	281.7	RH/CR	30	98.0	0.5	4	60	50	100	100	4	36	12	**52**	**14**	**Fair**	**3A**	**Yellow**
V-111-00	281.7	309.6	BCR	71	89.8	0.1	4	60	80	100	100	8	40	19	**67**	**42**	**Good**	**2B**	**Green**
V-111-00	309.6	311.1	SS	10	100.0	0.0	4	60	65	100	100	2	1	16	**19**	**2**	**V.Poor**	**5A**	**Red**
V-111-00	311.3	312.3	Ga	41	100.0	0.0	3	65	80	100	100	5	40	21	**66**	**25**	**Good**	**2B**	**Green**
V-111-00	312.3	346.0	Gn	168	98.5	1.2	2	70	85	100	100	17	31	24	**72**	**92**	**Good**	**2A**	**Green**

APPENDIX 1
GEOTECHNICAL DATA

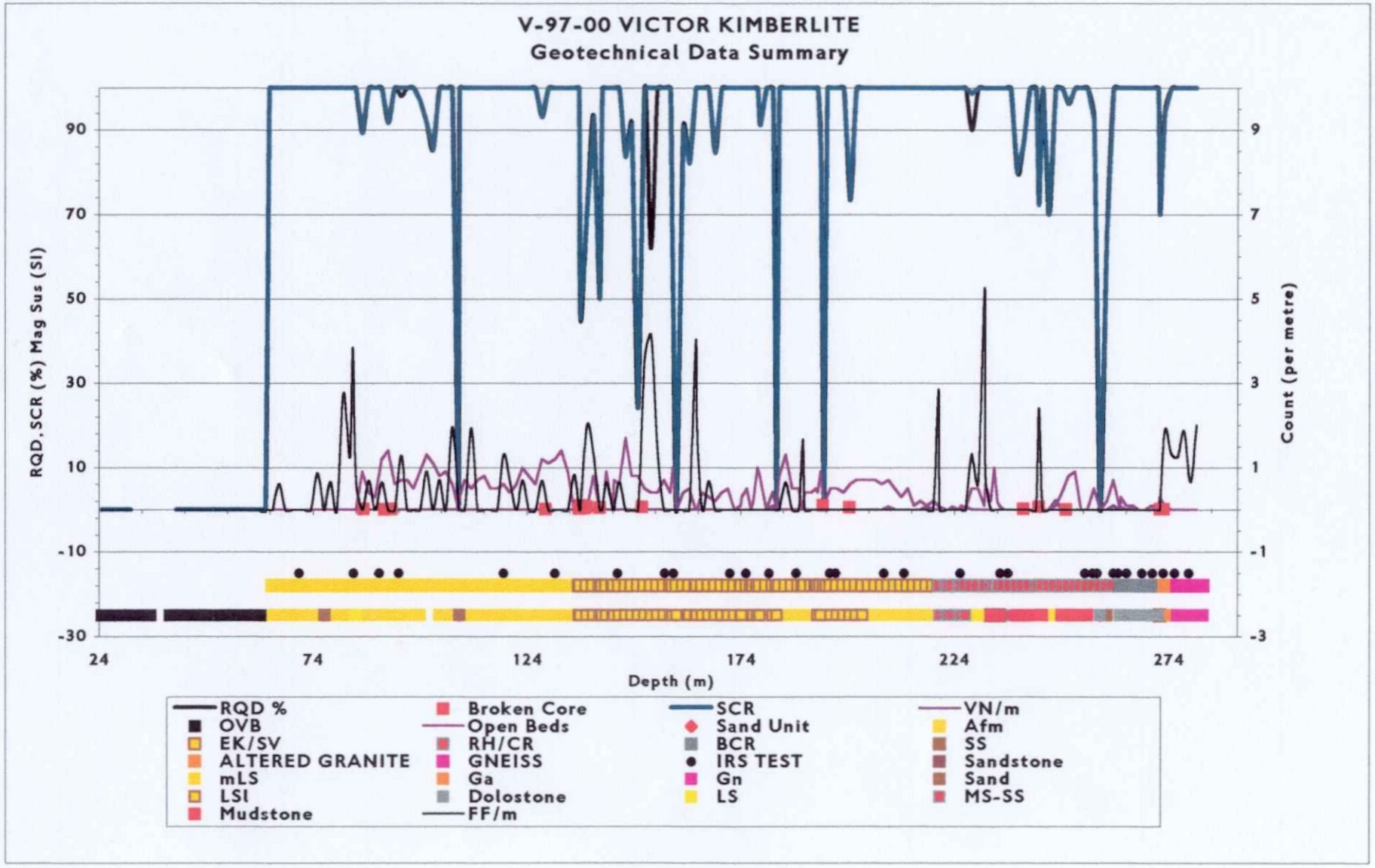
GEOTECHNICAL LOGGING/MAPPING - OUTPUT

LOCATION			Unit	IRS	RQD	JF/m	JOINT CONDITIONS					RATINGS			RMR	RMS	DES	CATE	COL
Point/BH	FROM	TO	Code	AVG		AVG	average adjustments					IRS	FF	JC			CRIP	GORY	OUR
ID	m	m		MPa	%	1/m	water	large	small	alt	fill	rating	rating	rating	rating	MPa	TION		
V-111-00	0.0	11.4	OVB	-	-	0.0	-	-	-	-	-	-	1	0	-	-	-	-	-
V-111-00	11.4	179.7	KIMBERLITE	50	100.0	0.7	3	65	85	100	100	6	36	22	**64**	**29**	**Good**	**2B**	**Green**
V-111-00	179.7	244.0	EK/SR	38	69.1	2.9	3	65	85	100	100	5	26	22	**53**	**18**	**Fair**	**3A**	**Yellow**
V-111-00	244.0	252.0	KIMBERLITE	26	98.8	0.2	4	60	80	100	100	4	40	19	**63**	**15**	**Good**	**2B**	**Green**
V-111-00	252.0	266.2	RH/CR	30	95.4	0.4	4	60	50	100	100	4	38	12	**54**	**15**	**Fair**	**3A**	**Yellow**
V-111-00	266.2	273.0	KIMBERLITE	12	94.4	0.1	4	60	80	100	100	3	40	19	**62**	**7**	**Good**	**2B**	**Green**
V-111-00	273.0	281.7	RH/CR	30	98.0	0.5	4	60	50	100	100	4	36	12	**52**	**14**	**Fair**	**3A**	**Yellow**
V-111-00	281.7	309.6	BCR	71	89.8	0.1	4	60	80	100	100	8	40	19	**67**	**42**	**Good**	**2B**	**Green**
V-111-00	309.6	311.1	SS	10	100.0	0.0	4	60	65	100	100	2	1	16	**19**	**2**	**V.Poor**	**5A**	**Red**
V-111-00	311.3	312.3	Ga	41	100.0	0.0	3	65	80	100	100	5	40	21	**66**	**25**	**Good**	**2B**	**Green**
V-111-00	312.3	346.0	Gn	168	98.5	1.2	2	70	85	100	100	17	31	24	**72**	**92**	**Good**	**2A**	**Green**

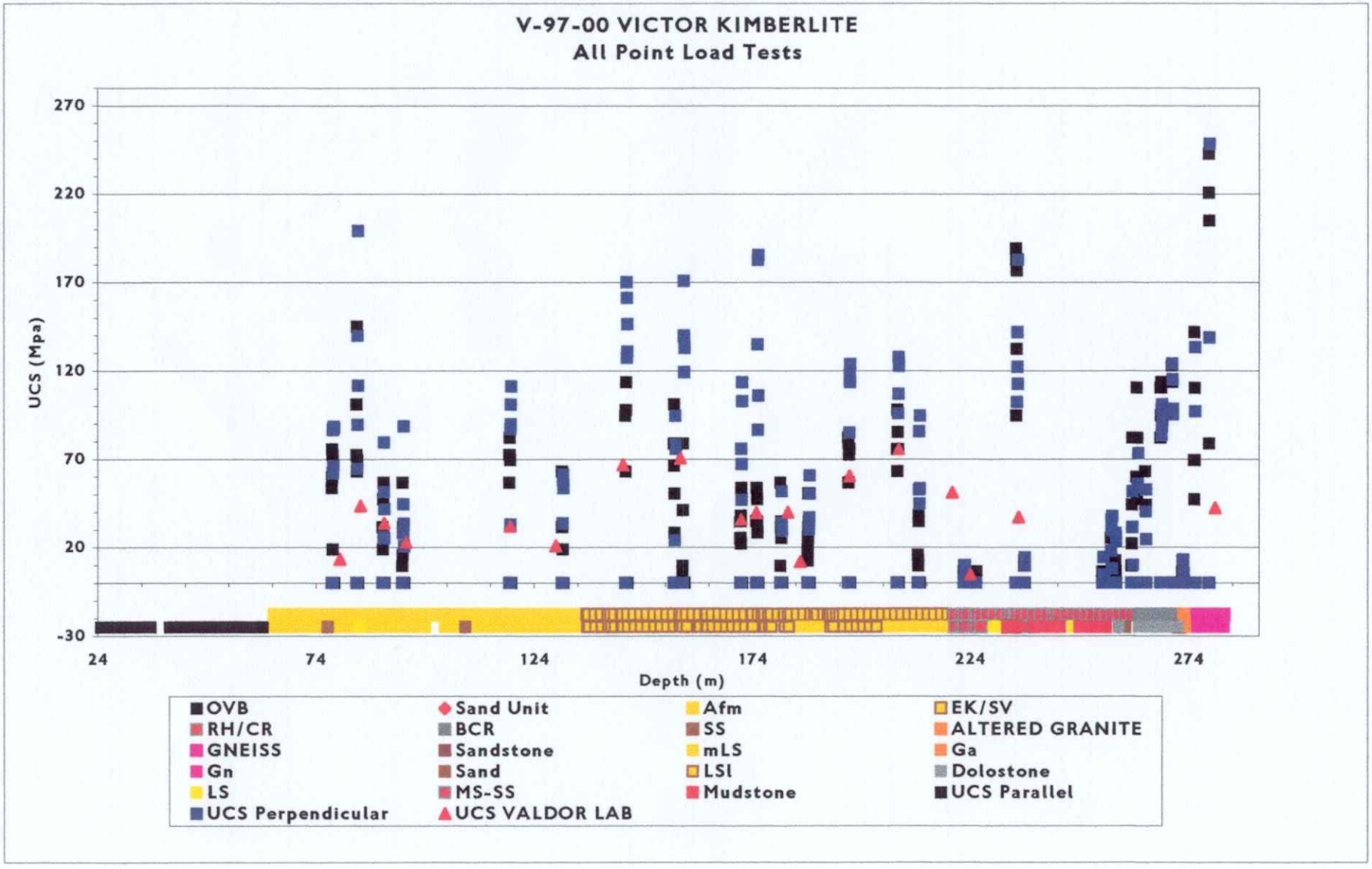
VICTOR 2000
GEOTECHNICAL PROGRAMME



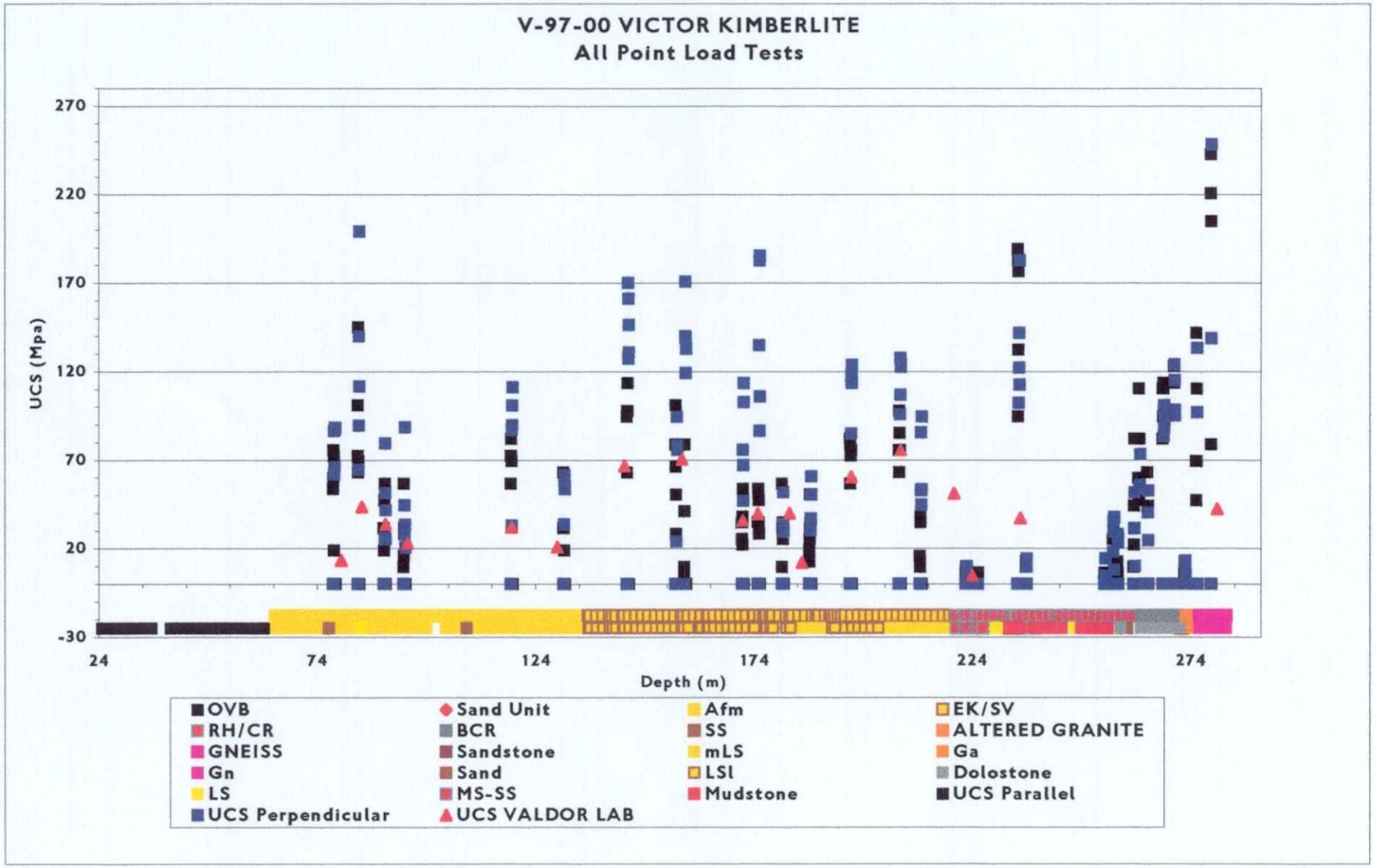
VICTOR 2000
GEOTECHNICAL PROGRAMME



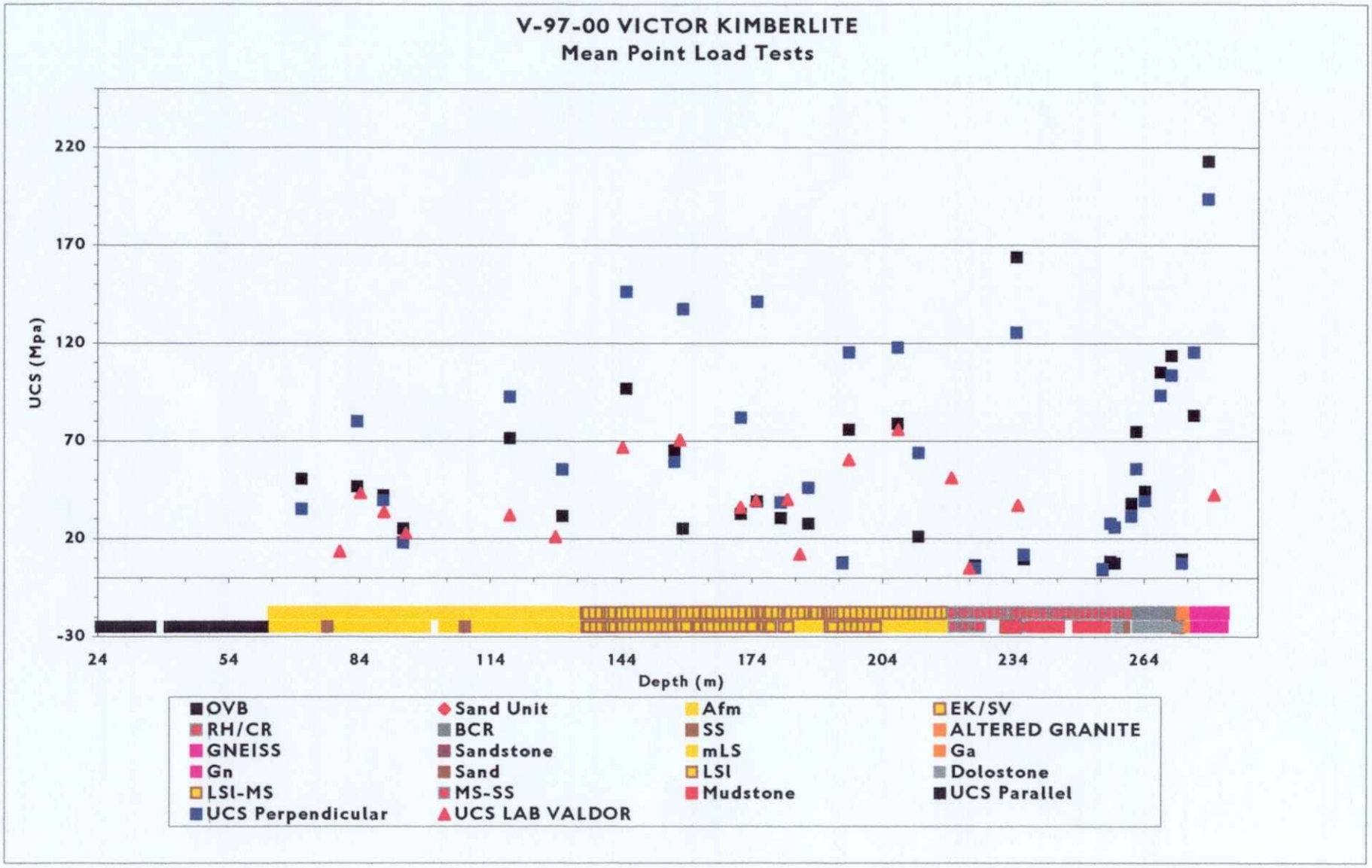
VICTOR 2000
GEOTECHNICAL PROGRAMME



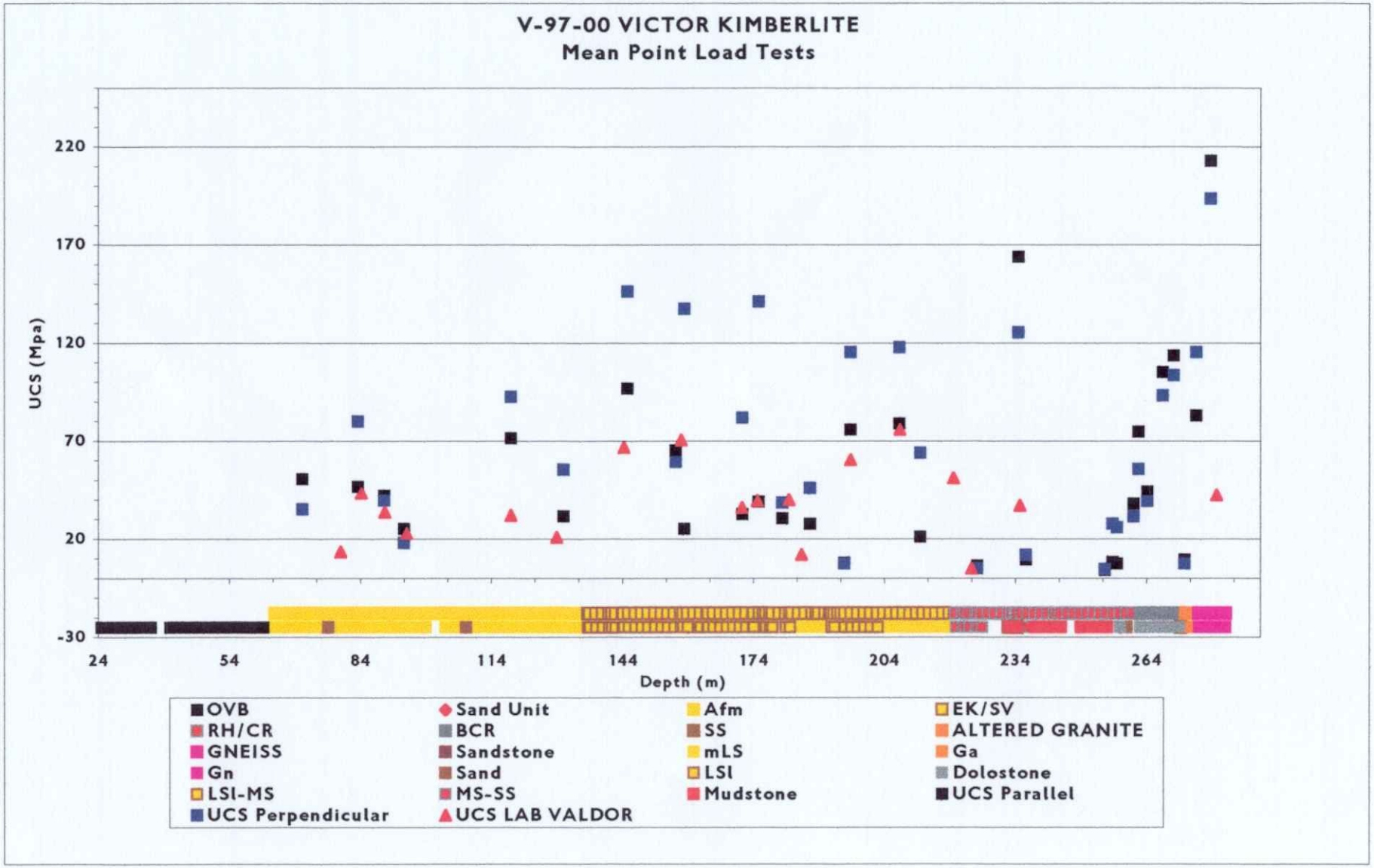
VICTOR 2000
GEOTECHNICAL PROGRAMME



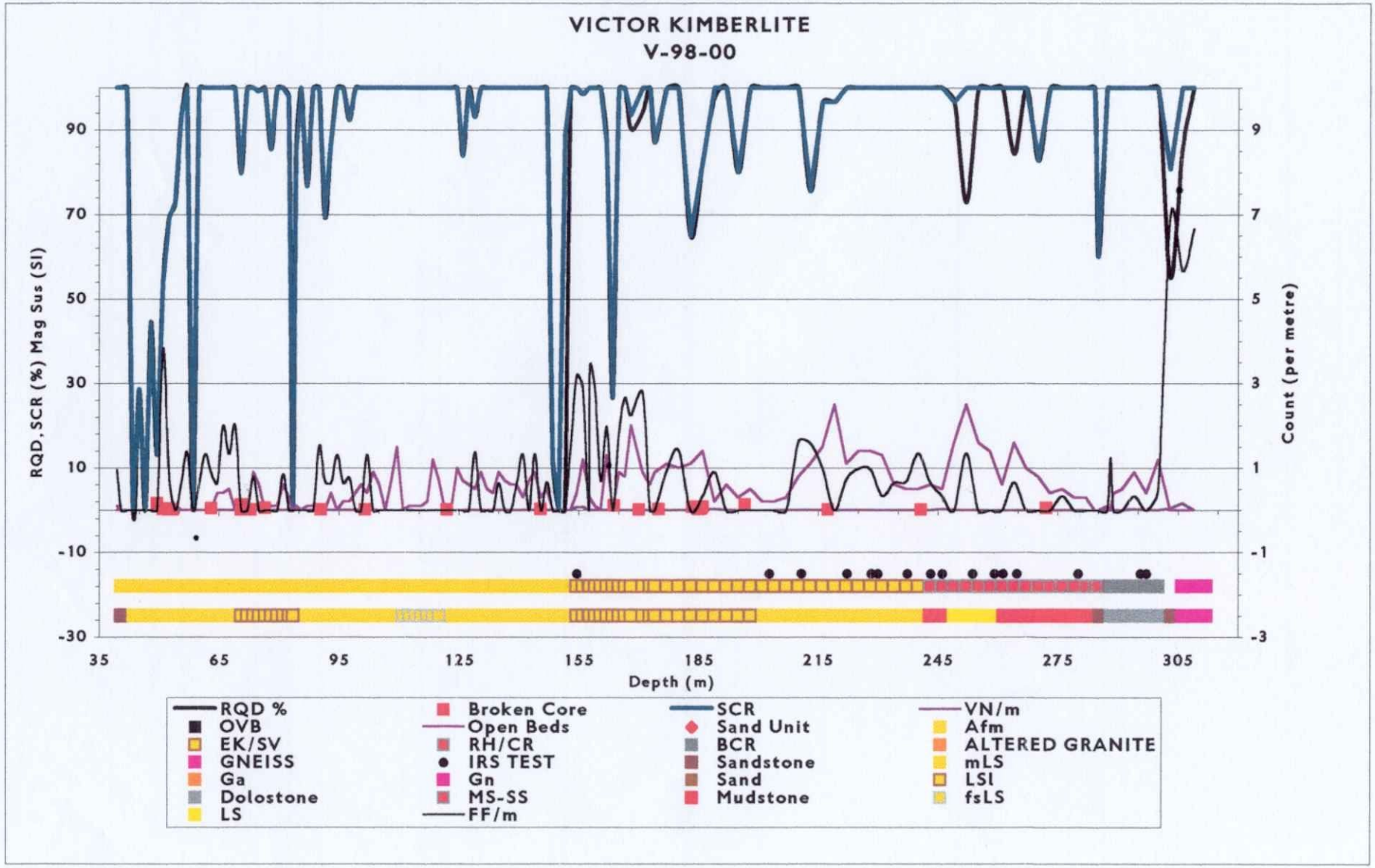
VICTOR 2000
GEOTECHNICAL PROGRAMME



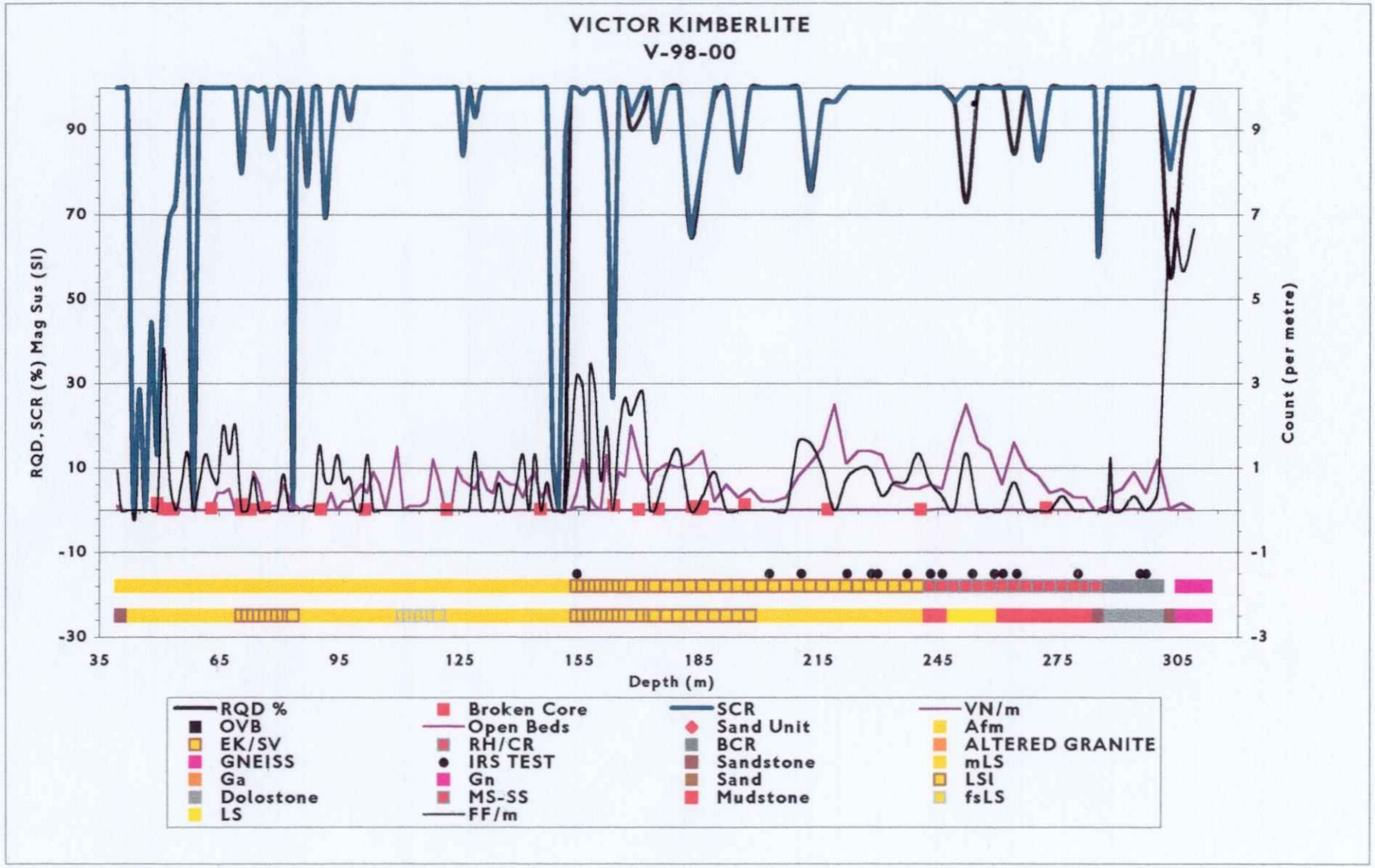
VICTOR 2000
GEOTECHNICAL PROGRAMME



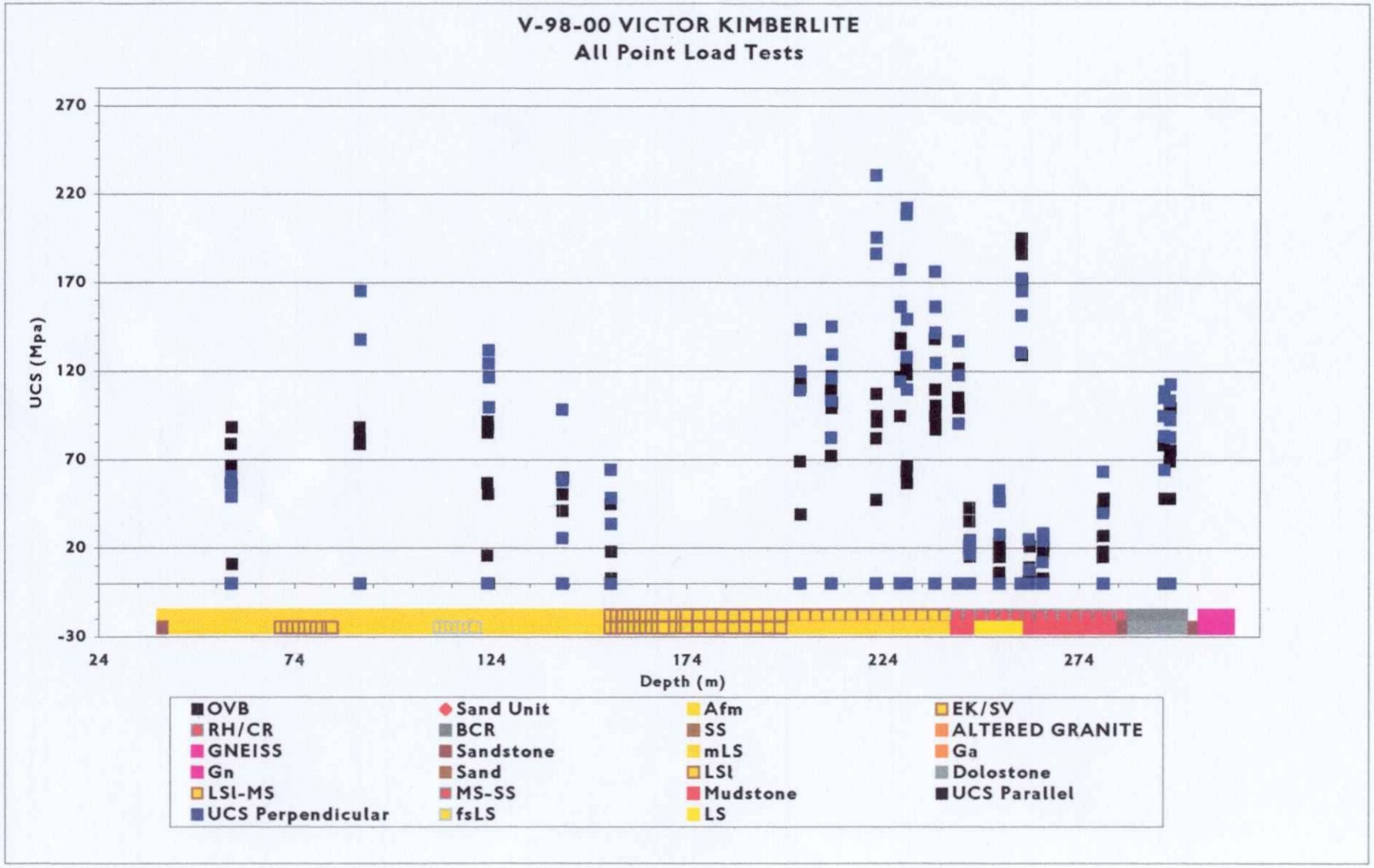
VICTOR 2000
GEOTECHNICAL PROGRAMME



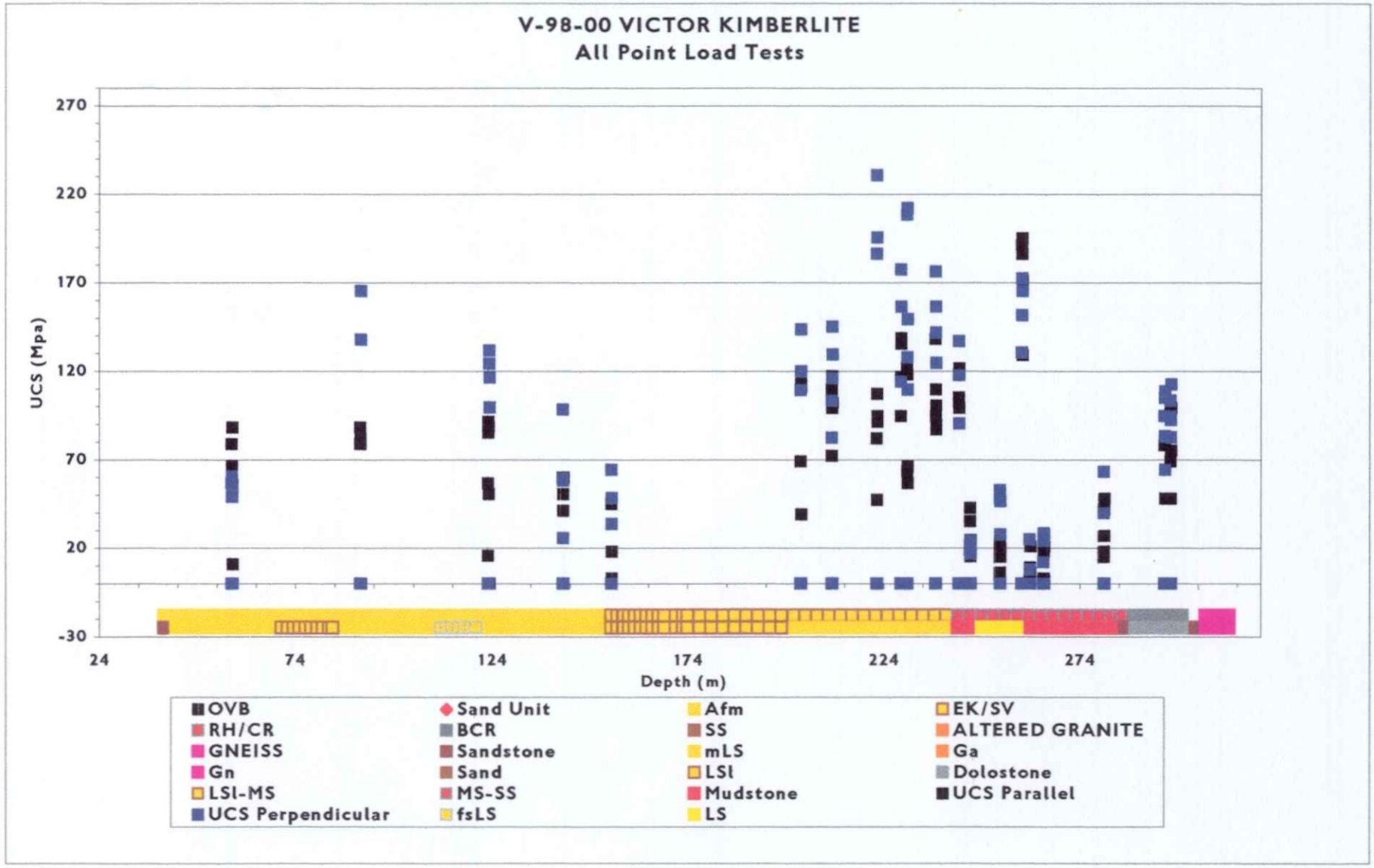
VICTOR 2000
GEOTECHNICAL PROGRAMME



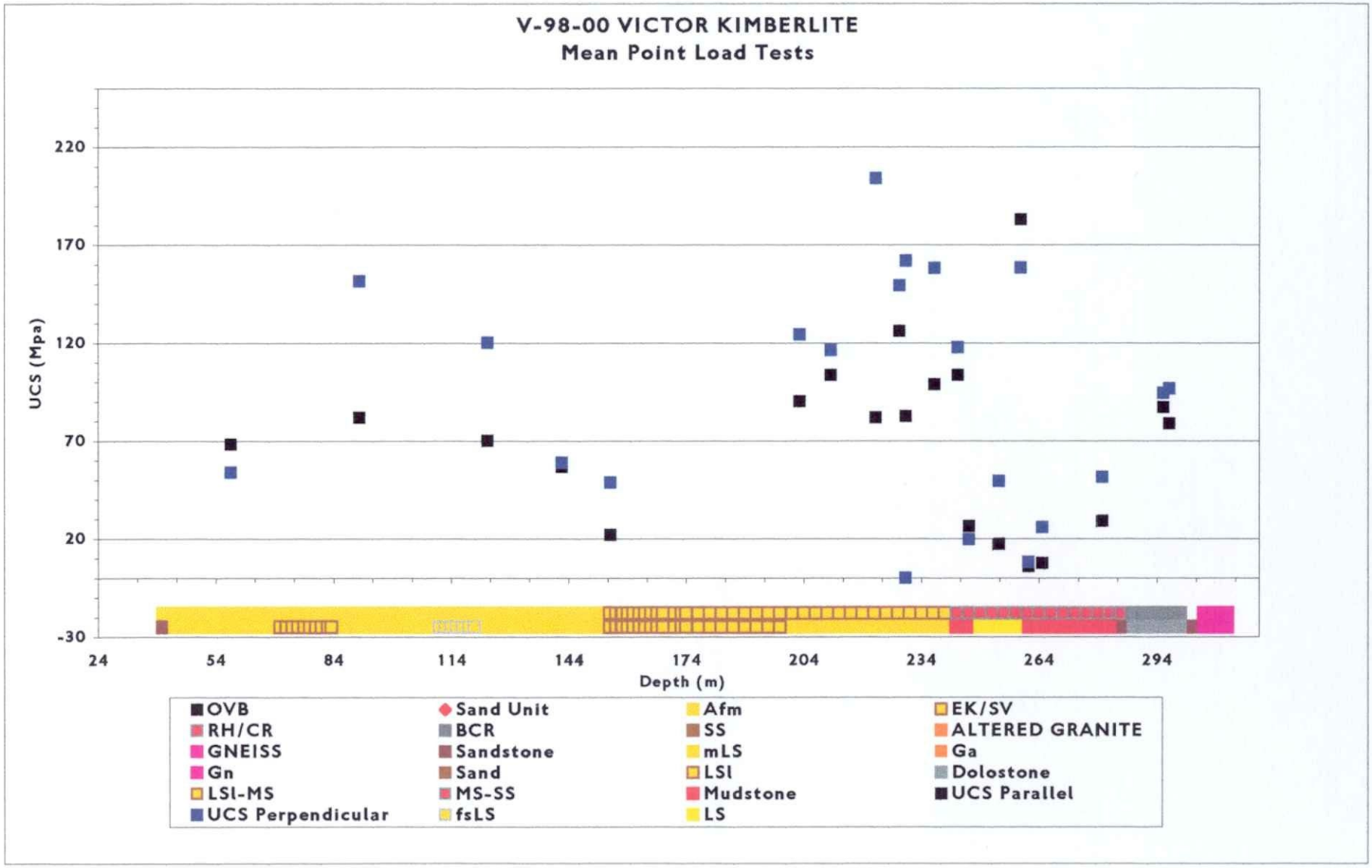
VICTOR 2000
GEOTECHNICAL PROGRAMME



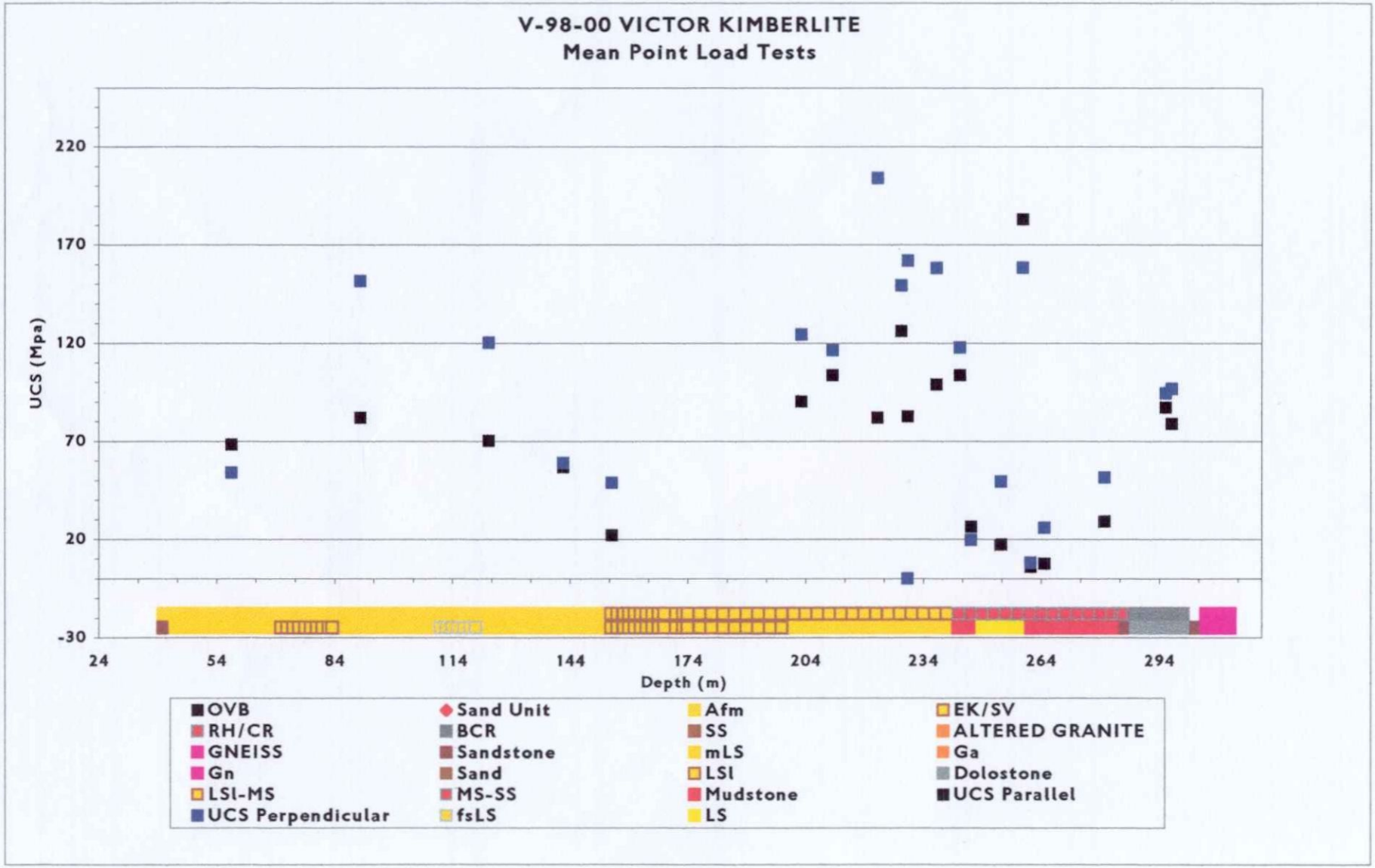
VICTOR 2000
GEOTECHNICAL PROGRAMME



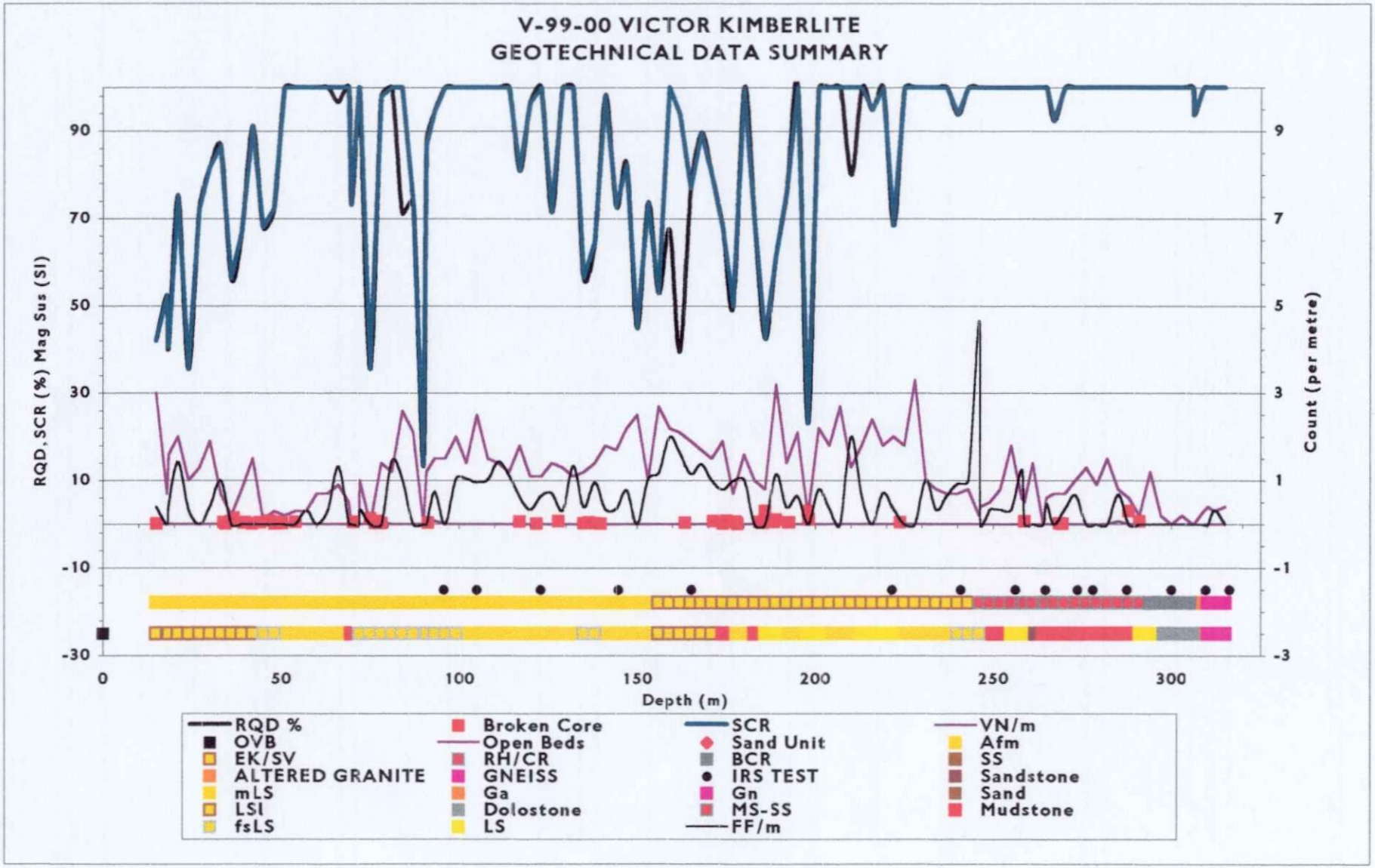
VICTOR 2000
GEOTECHNICAL PROGRAMME



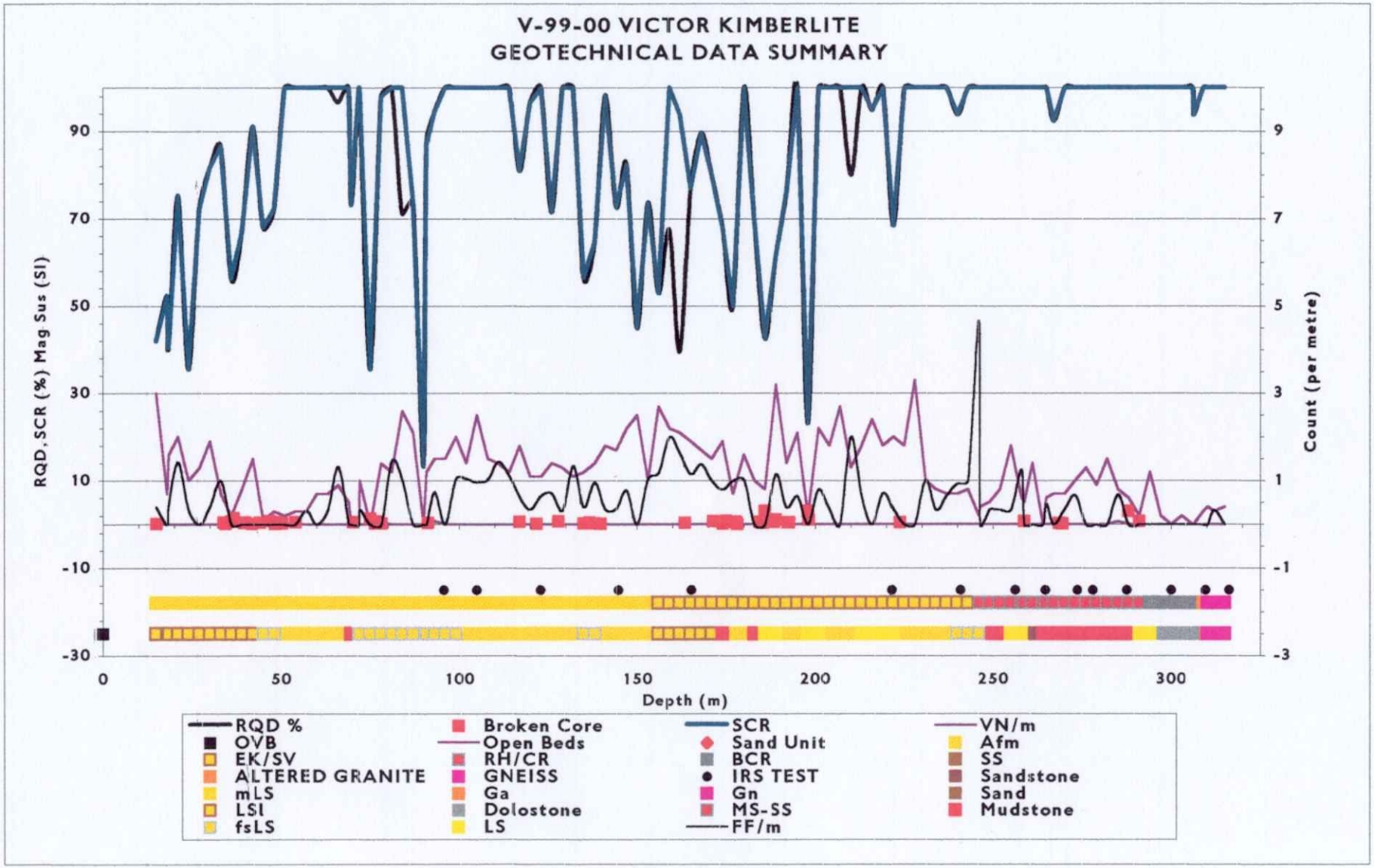
VICTOR 2000
GEOTECHNICAL PROGRAMME



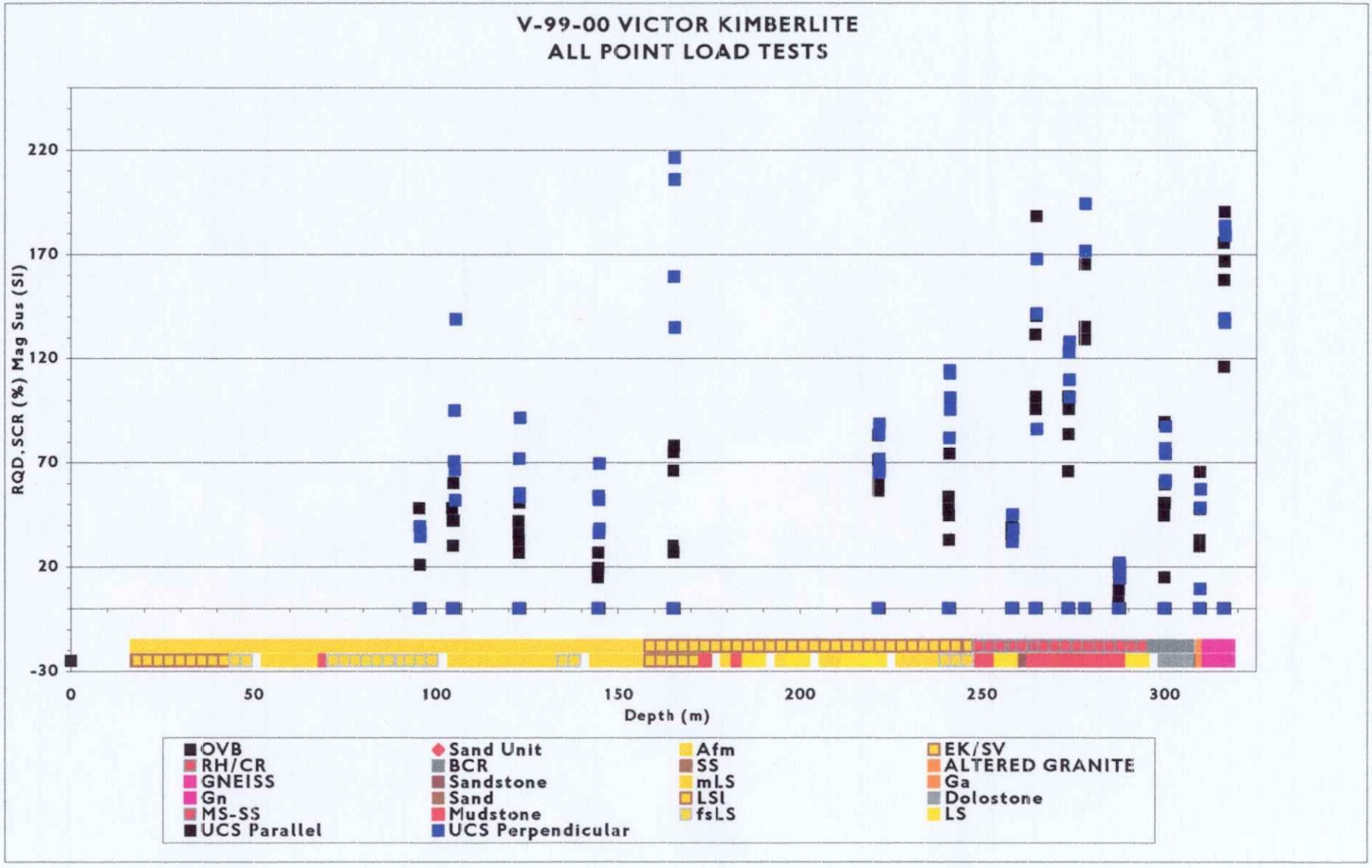
VICTOR 2000
GEOTECHNICAL PROGRAMME



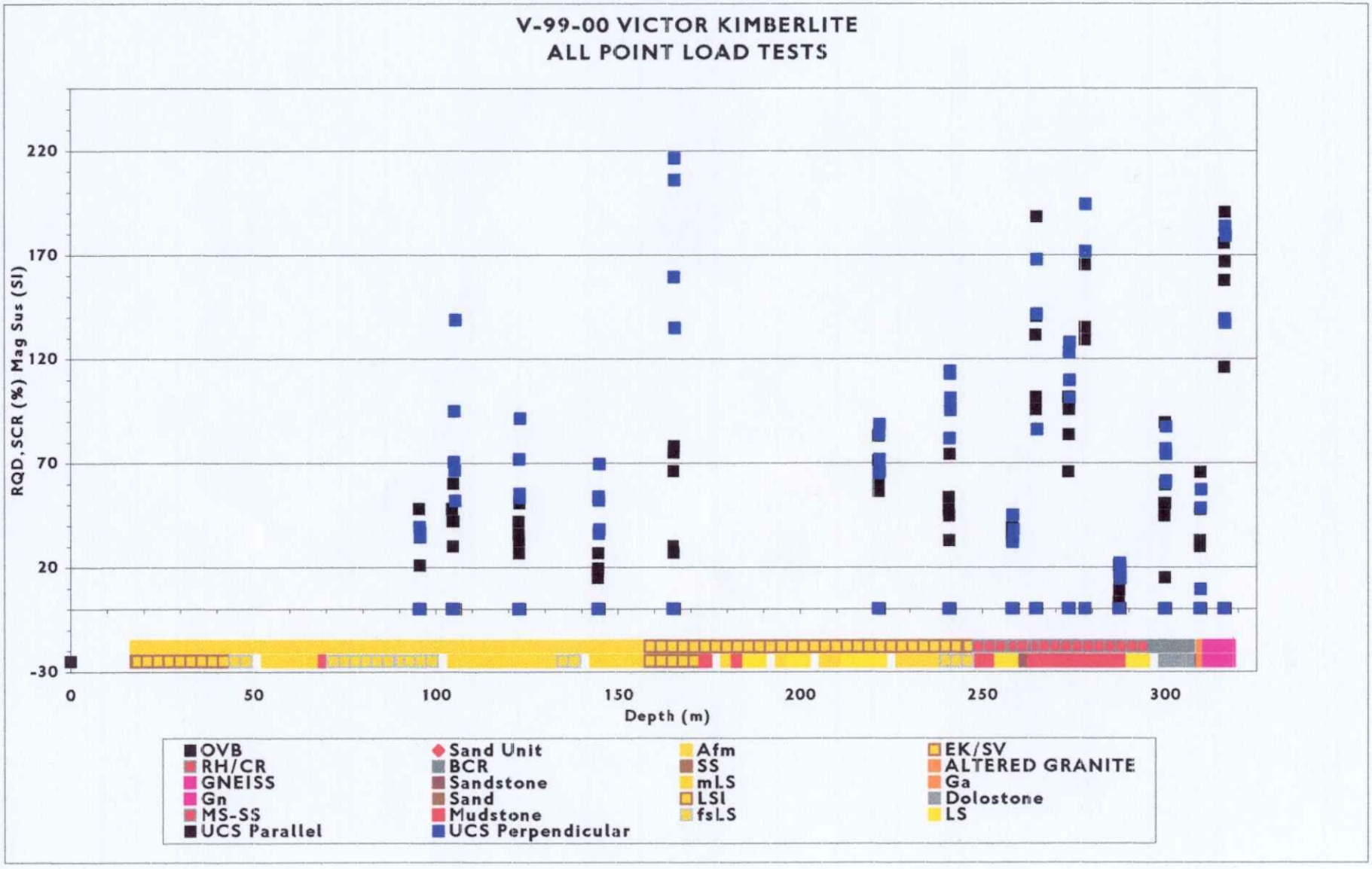
VICTOR 2000
GEOTECHNICAL PROGRAMME



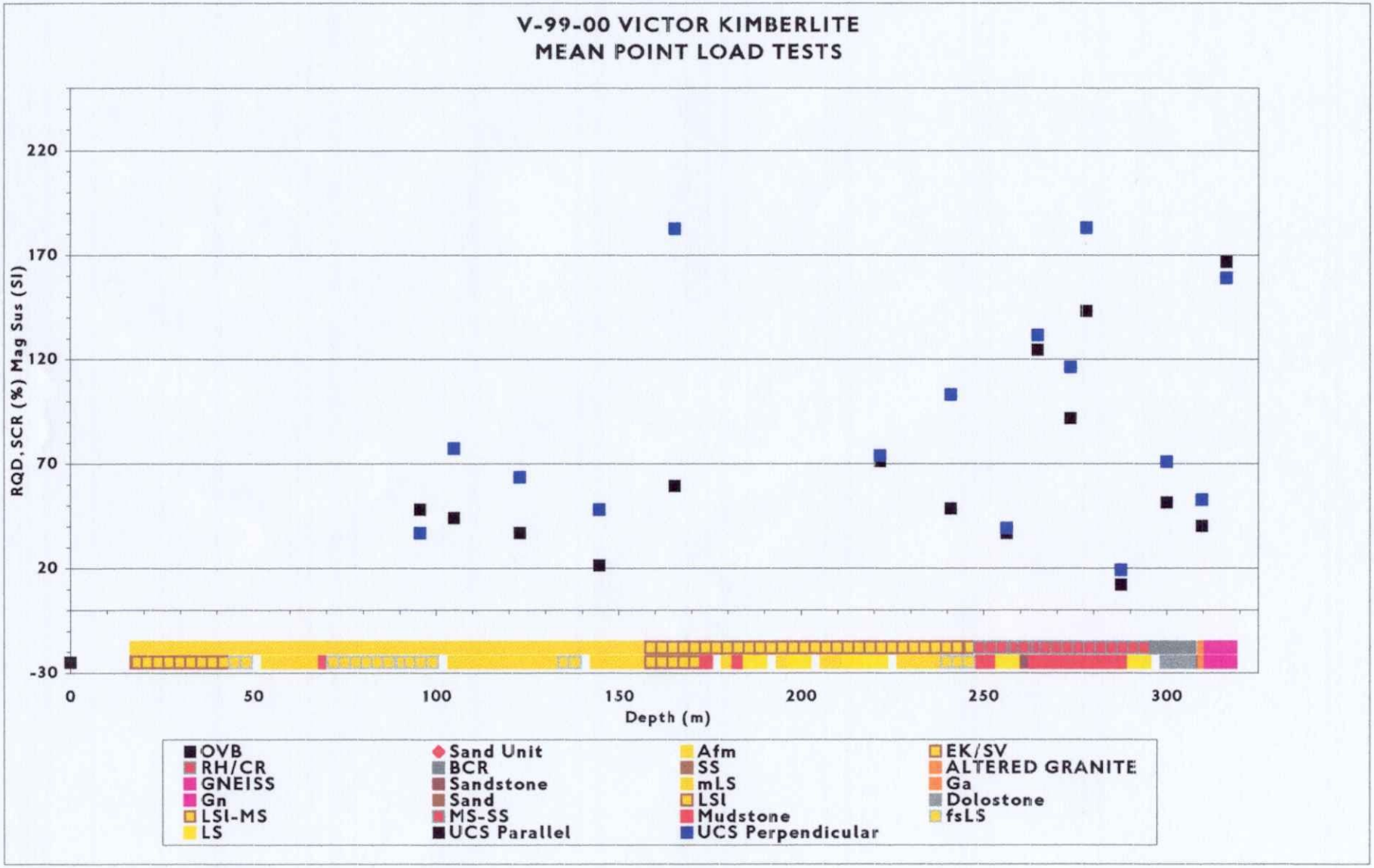
VICTOR 2000
GEOTECHNICAL PROGRAMME



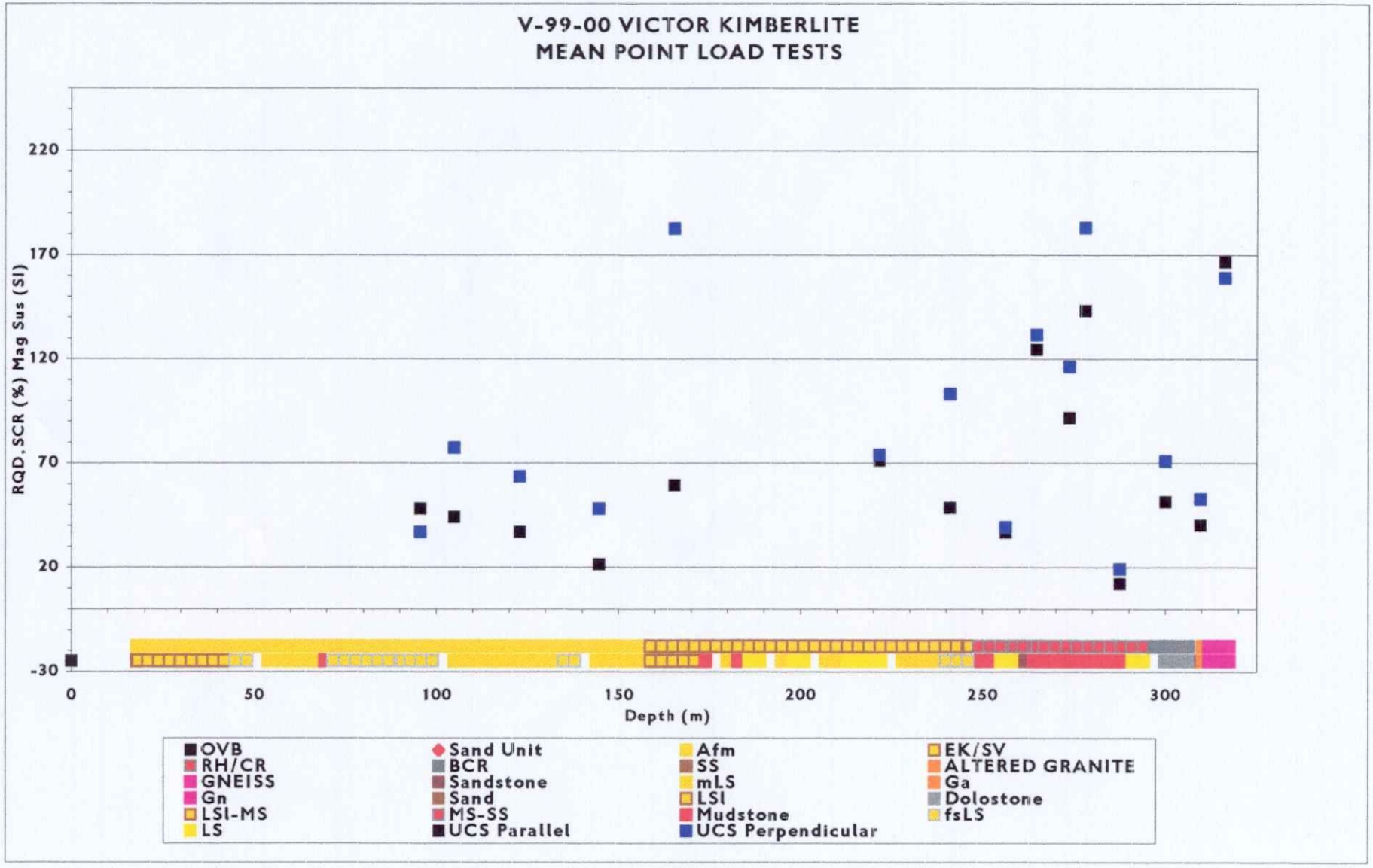
VICTOR 2000
GEOTECHNICAL PROGRAMME



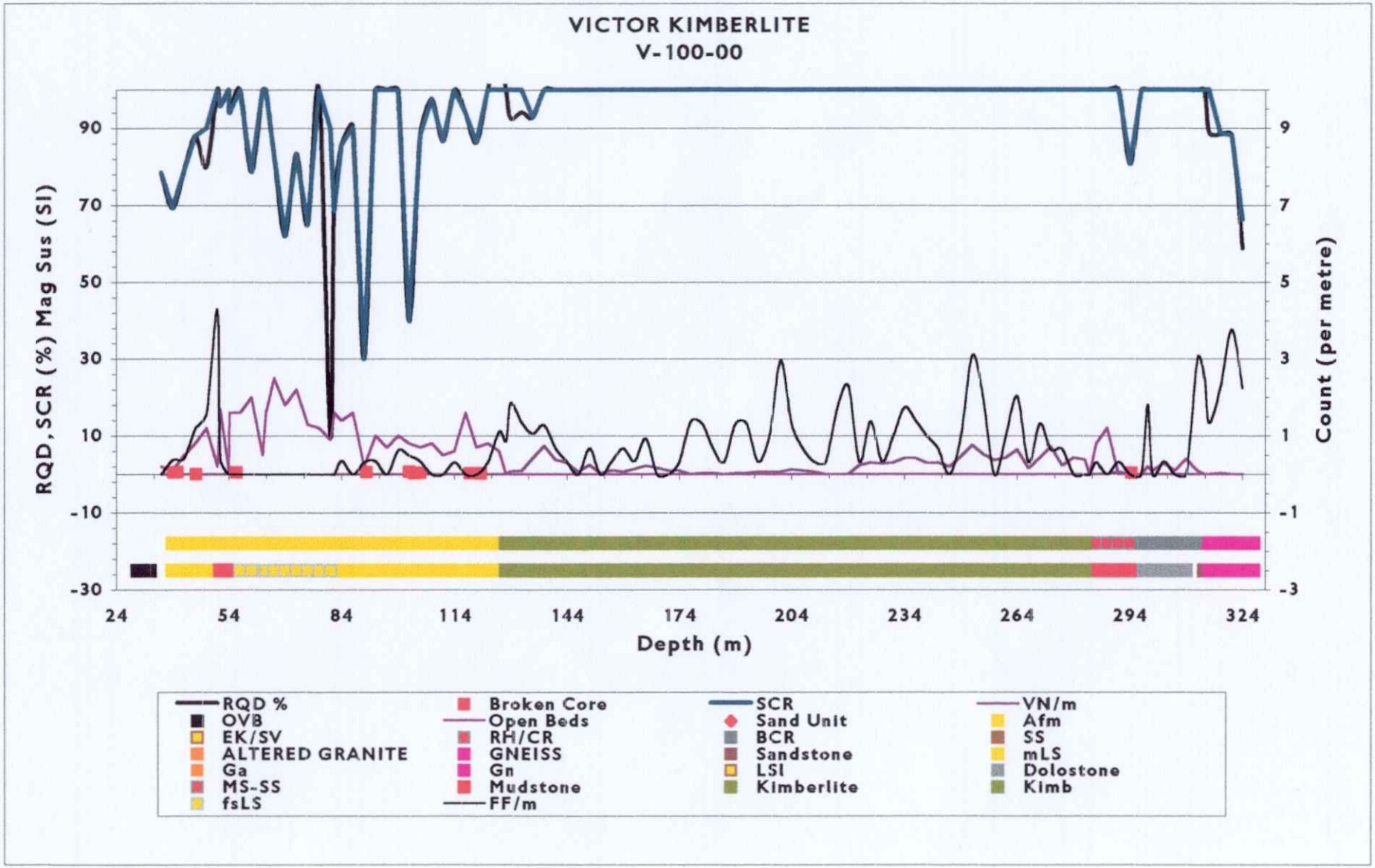
VICTOR 2000
GEOTECHNICAL PROGRAMME



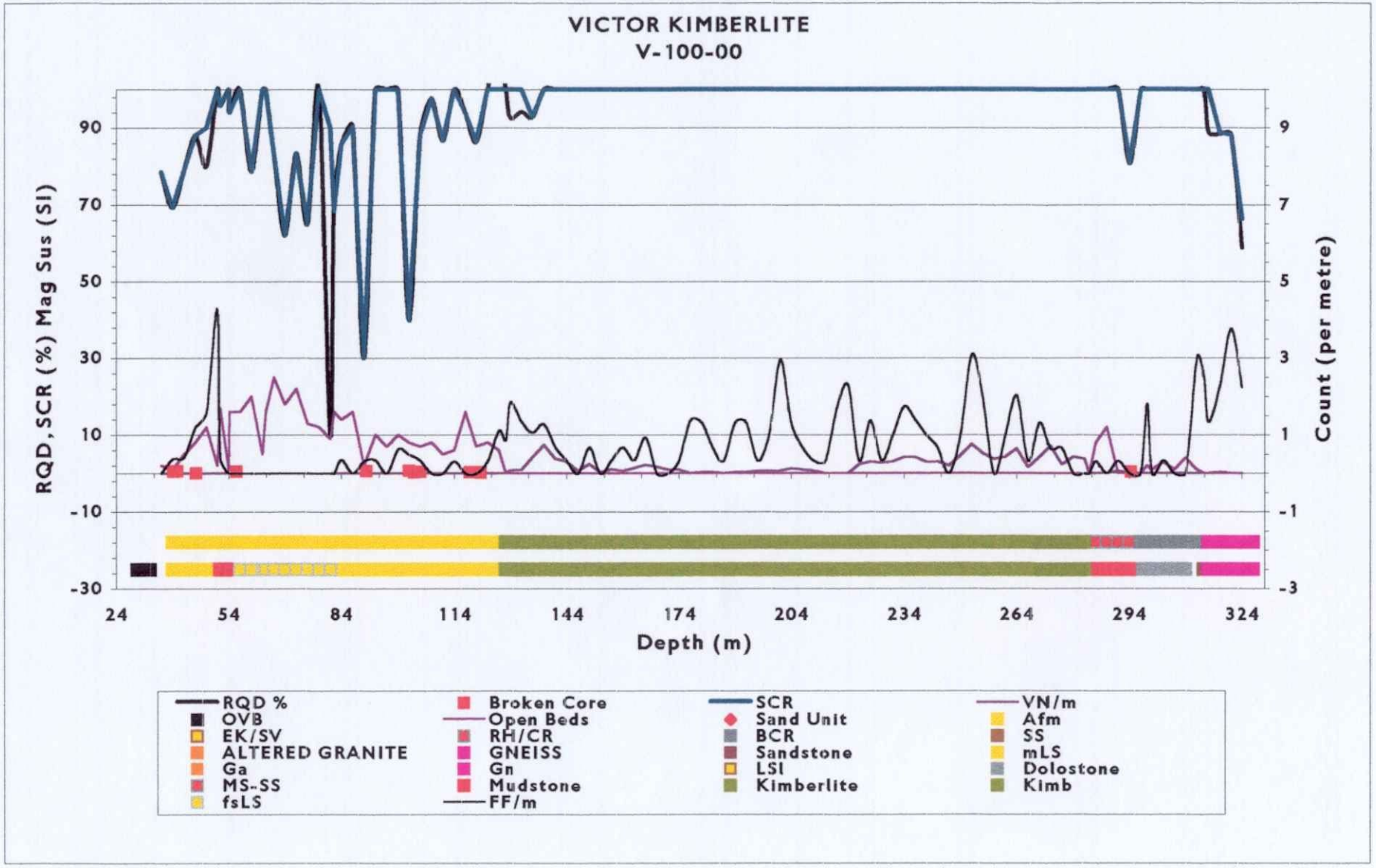
VICTOR 2000
GEOTECHNICAL PROGRAMME



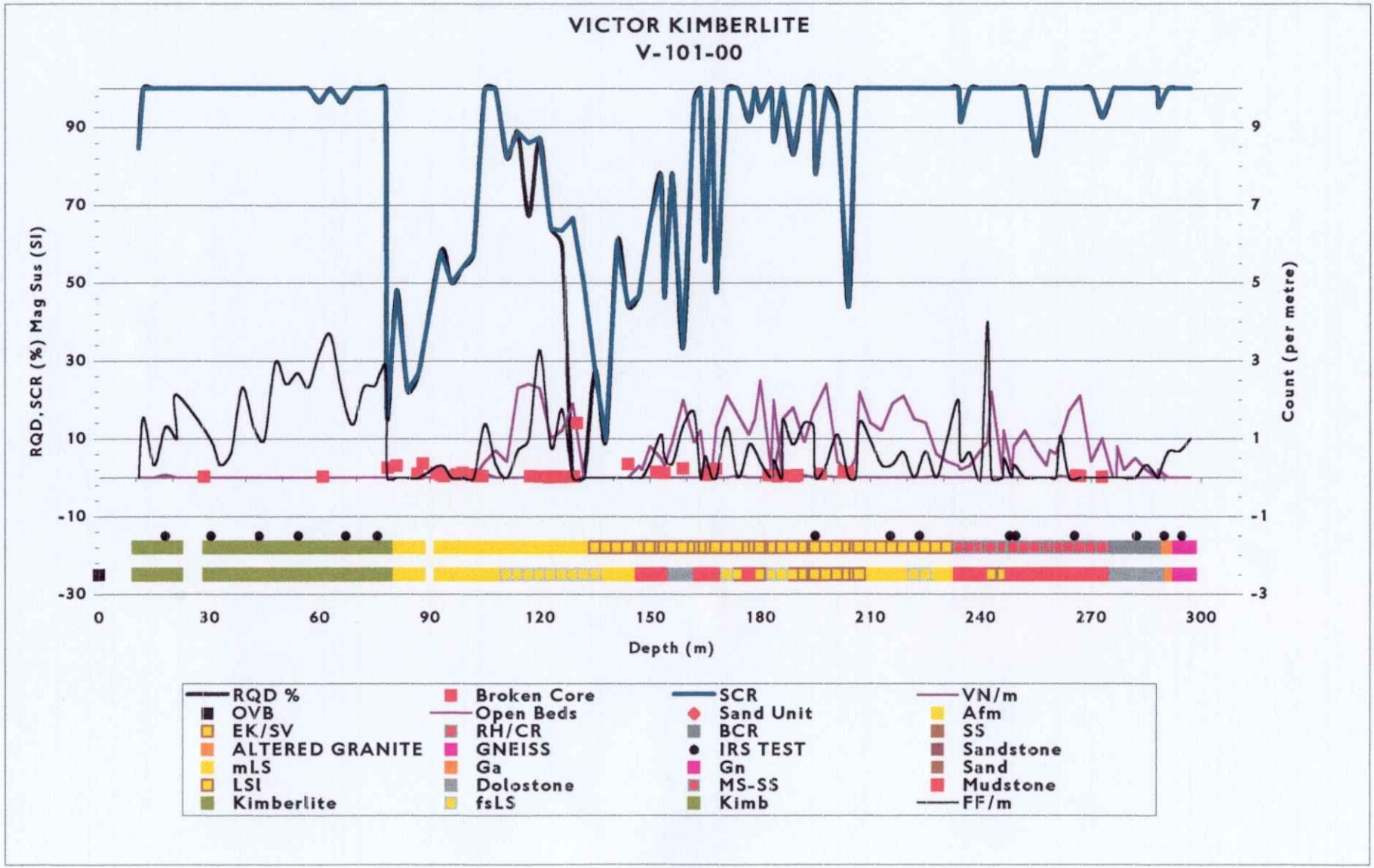
VICTOR 2000
GEOTECHNICAL PROGRAMME



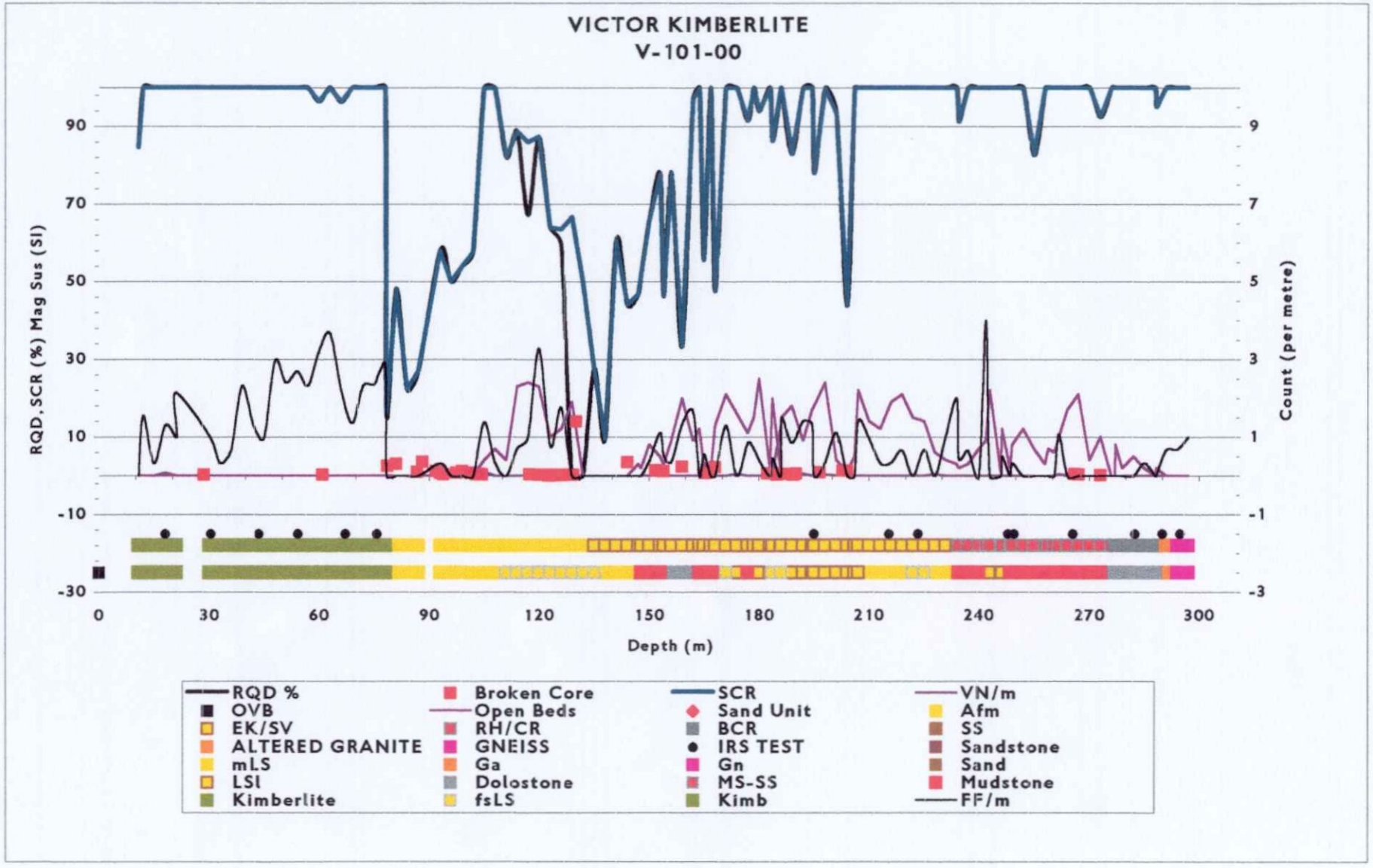
VICTOR 2000
GEOTECHNICAL PROGRAMME



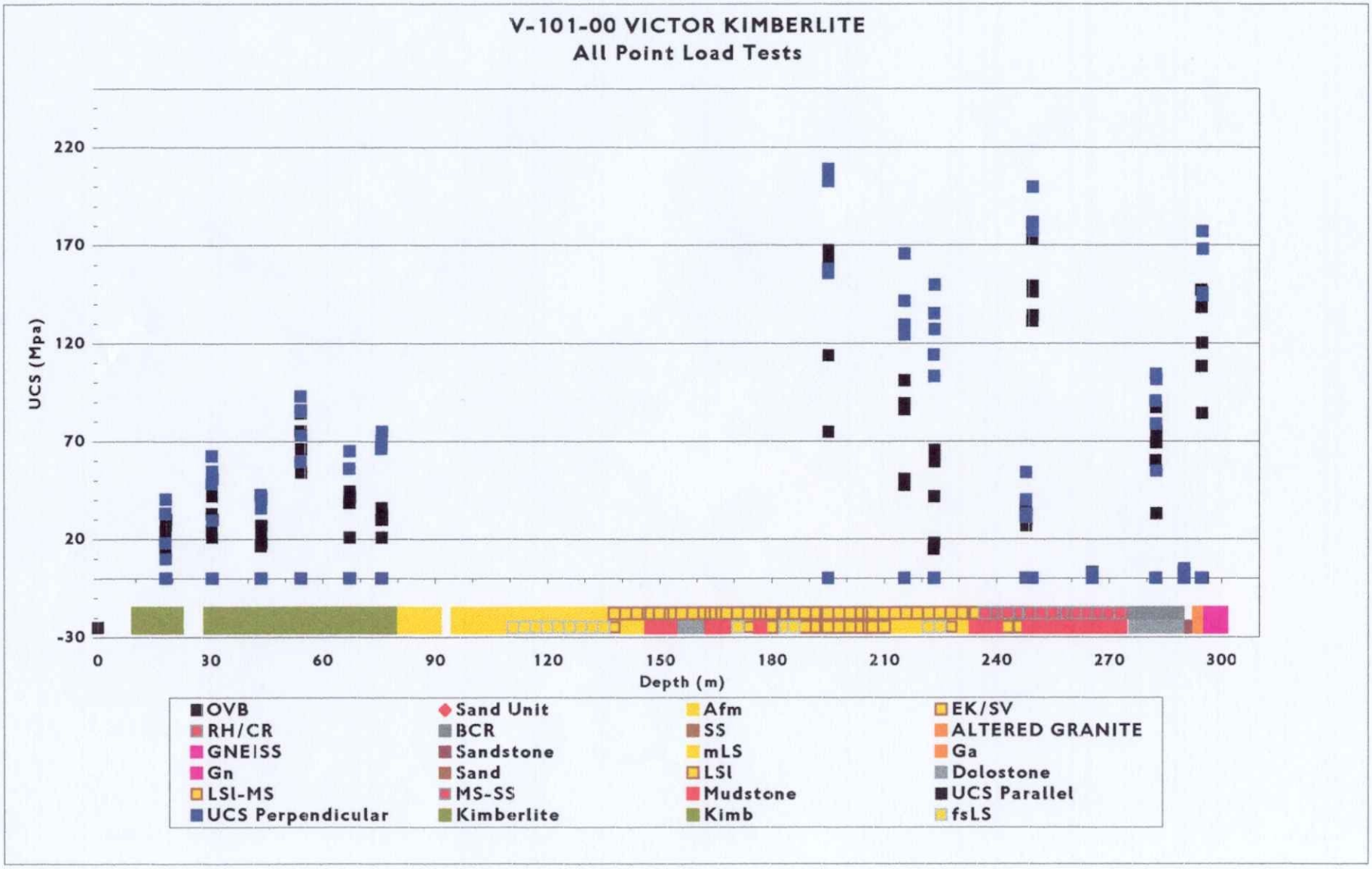
VICTOR 2000
GEOTECHNICAL PROGRAMME



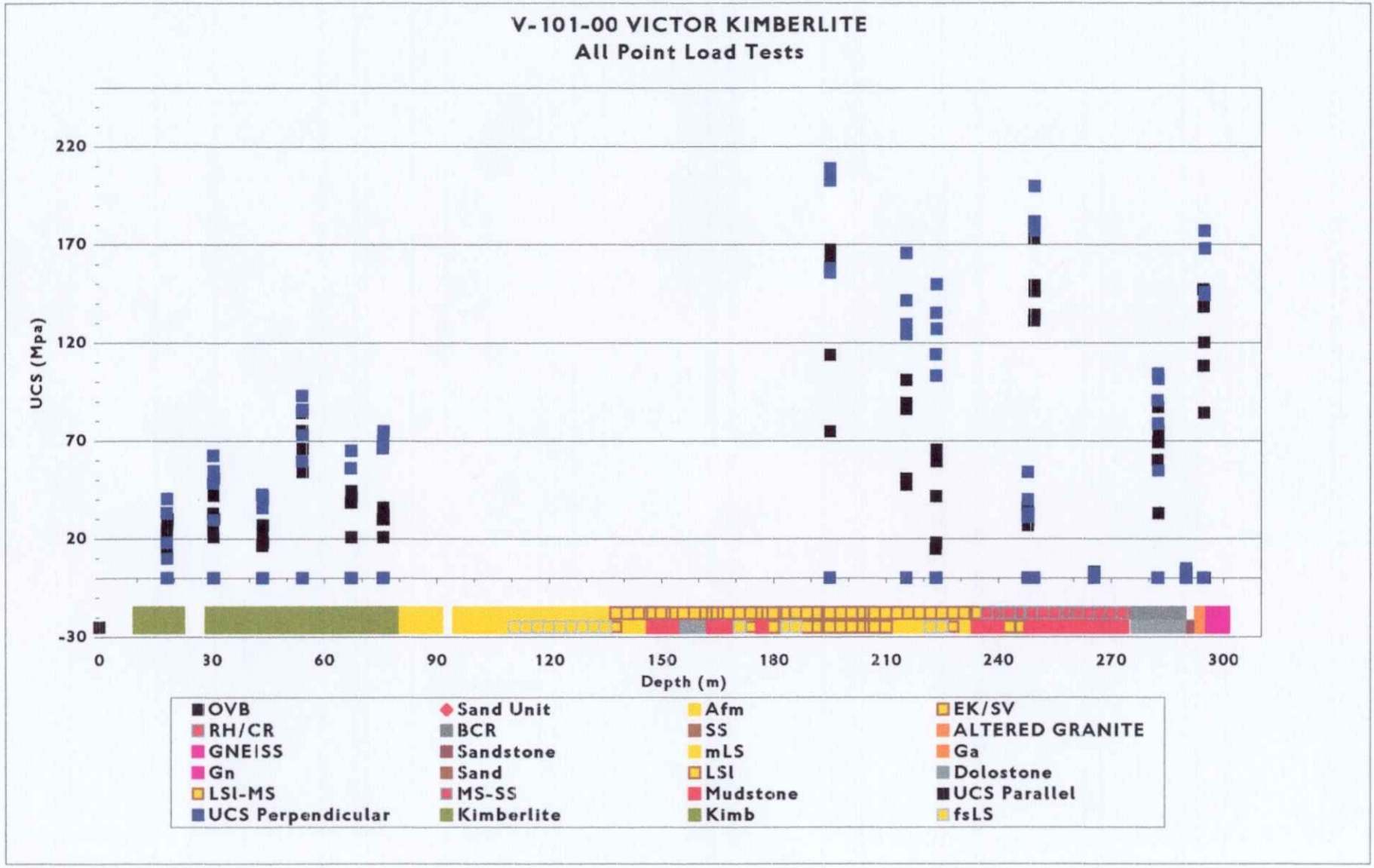
VICTOR 2000
GEOTECHNICAL PROGRAMME



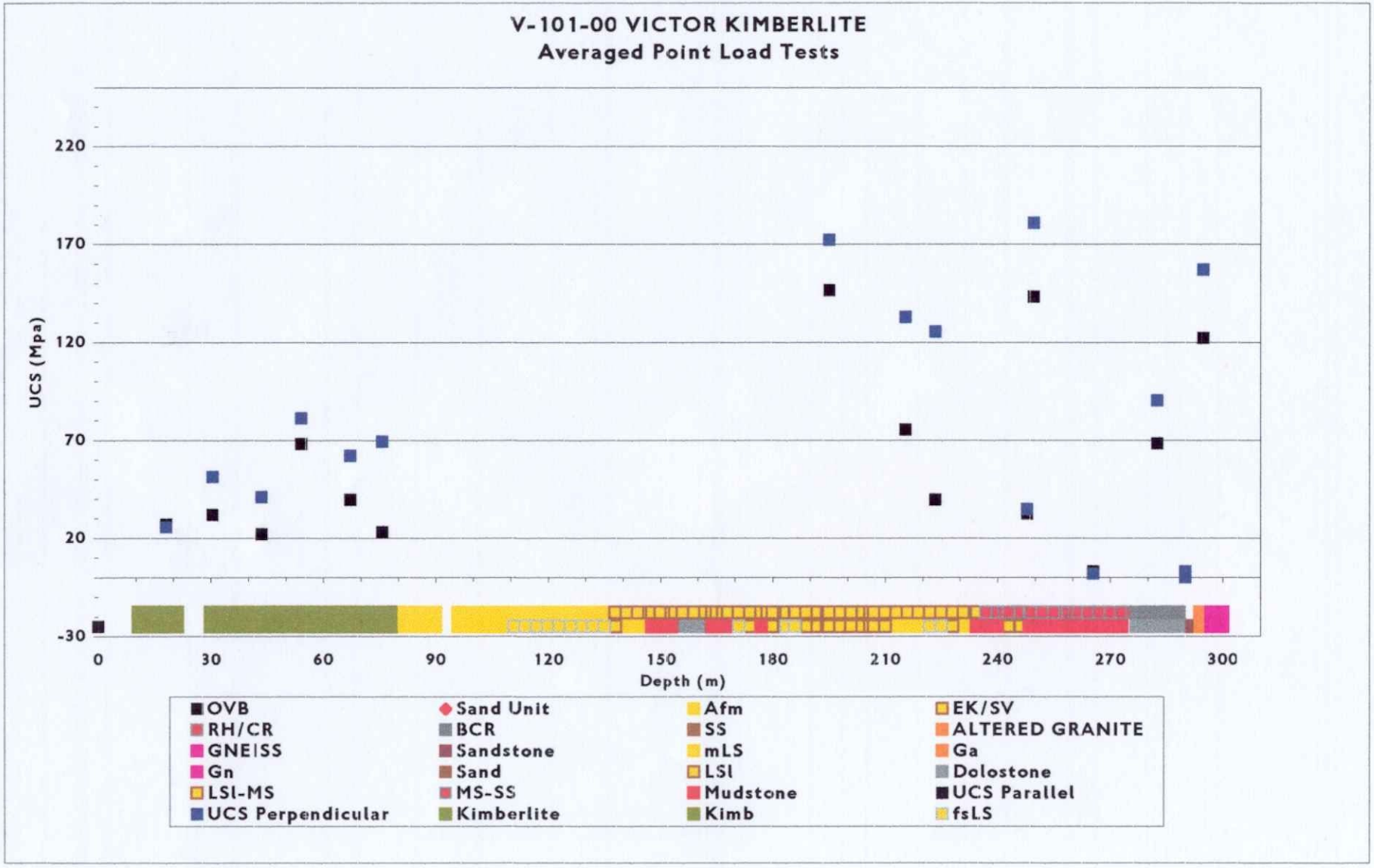
VICTOR 2000
GEOTECHNICAL PROGRAMME



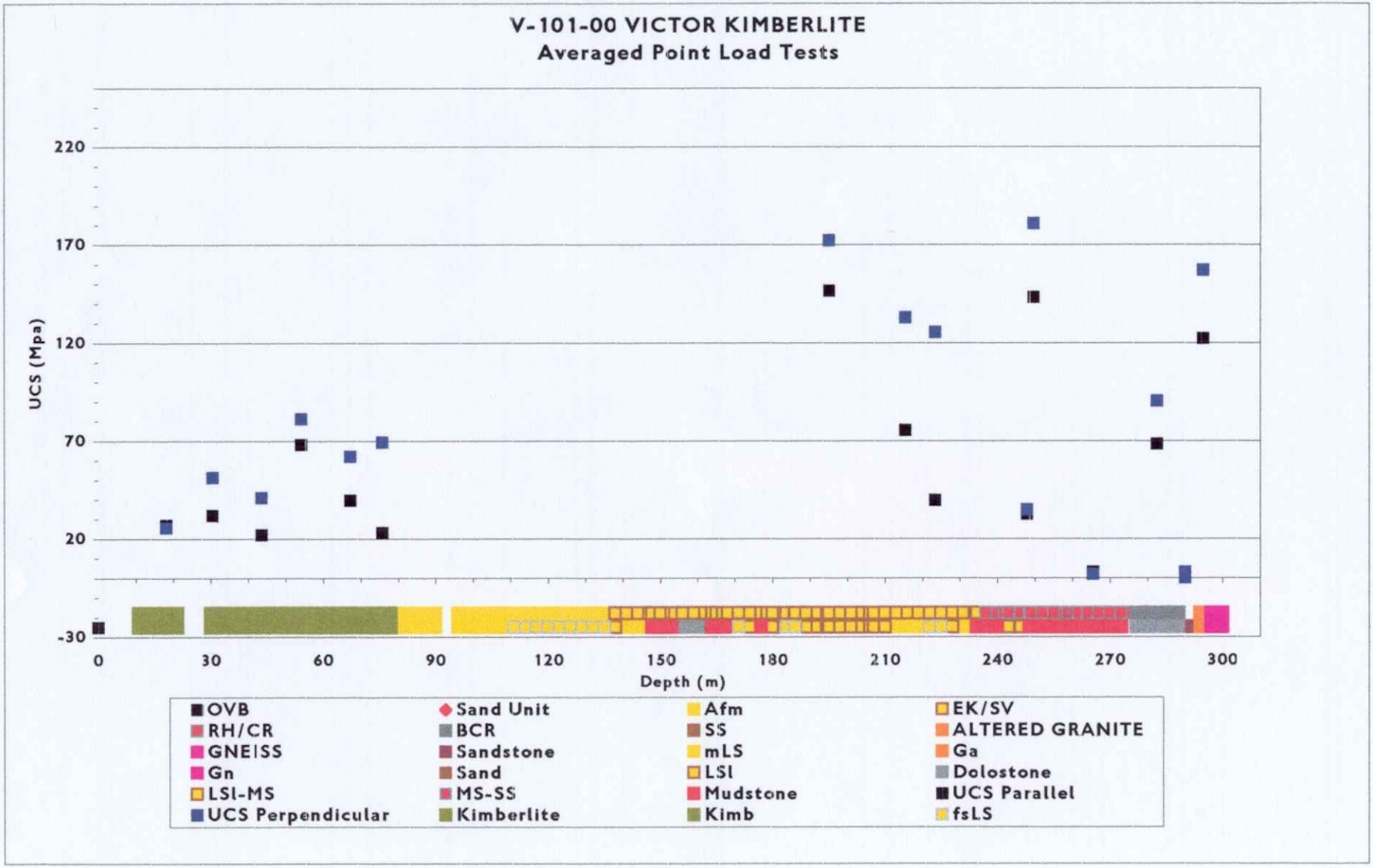
VICTOR 2000
GEOTECHNICAL PROGRAMME



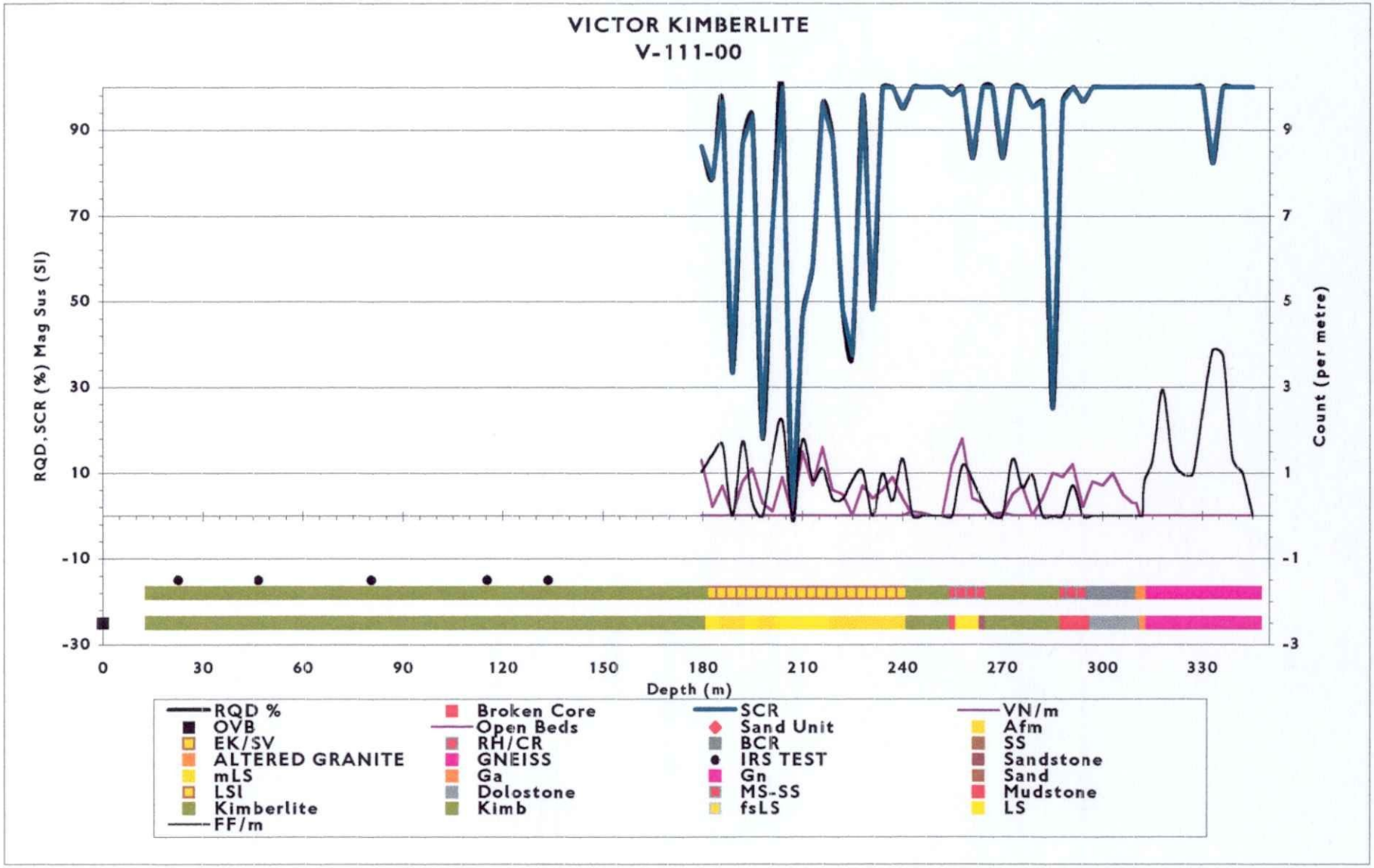
VICTOR 2000
GEOTECHNICAL PROGRAMME



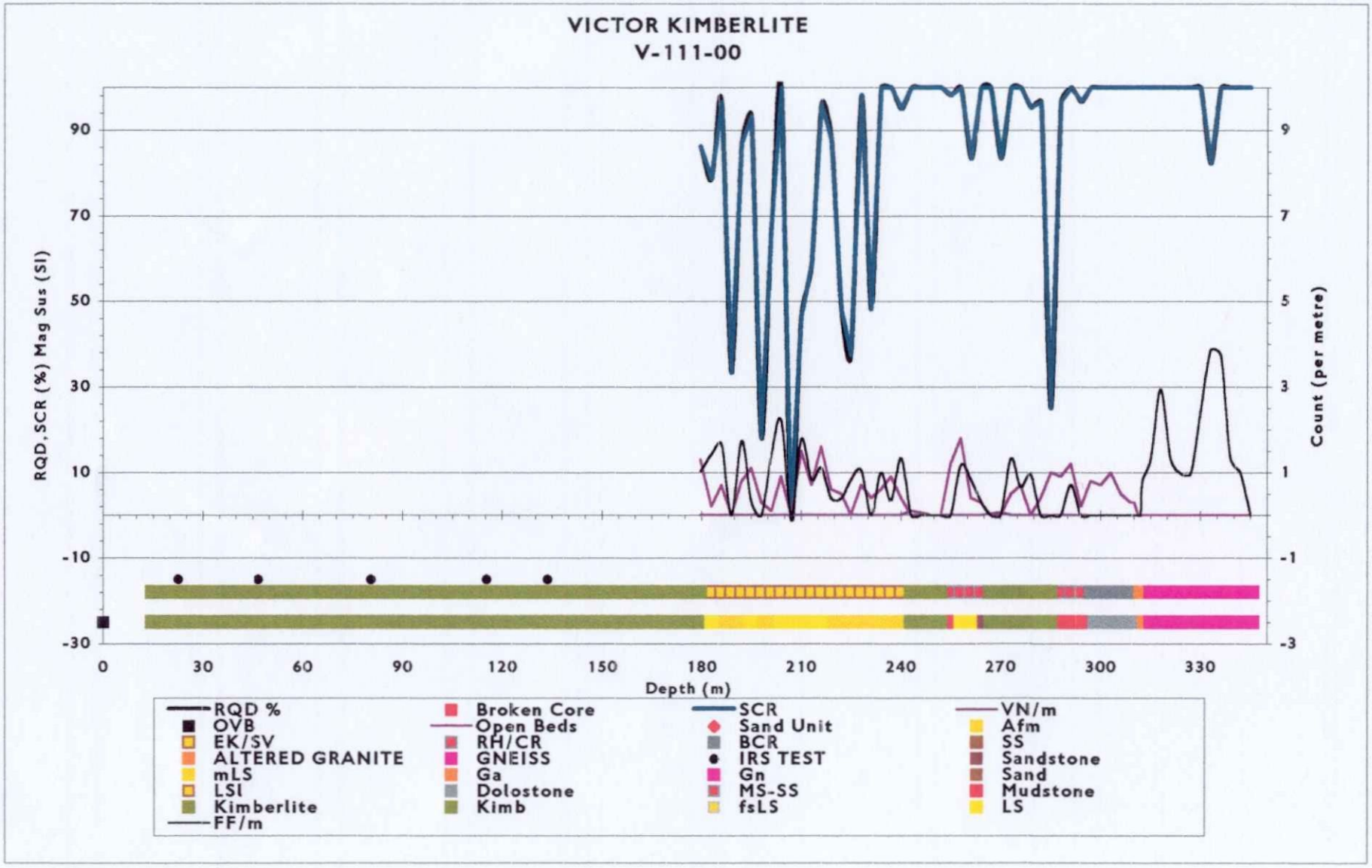
VICTOR 2000
GEOTECHNICAL PROGRAMME



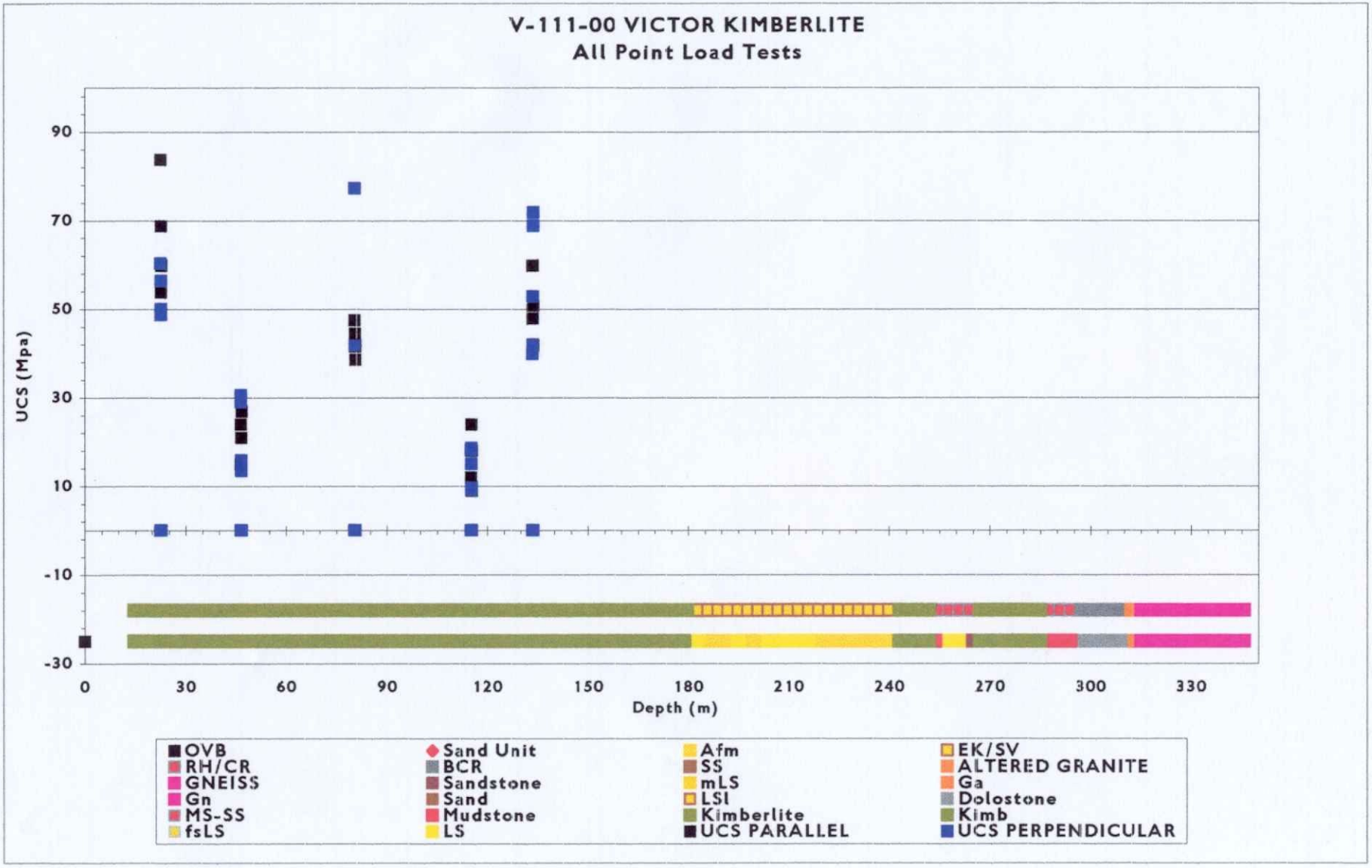
VICTOR 2000
GEOTECHNICAL PROGRAMME



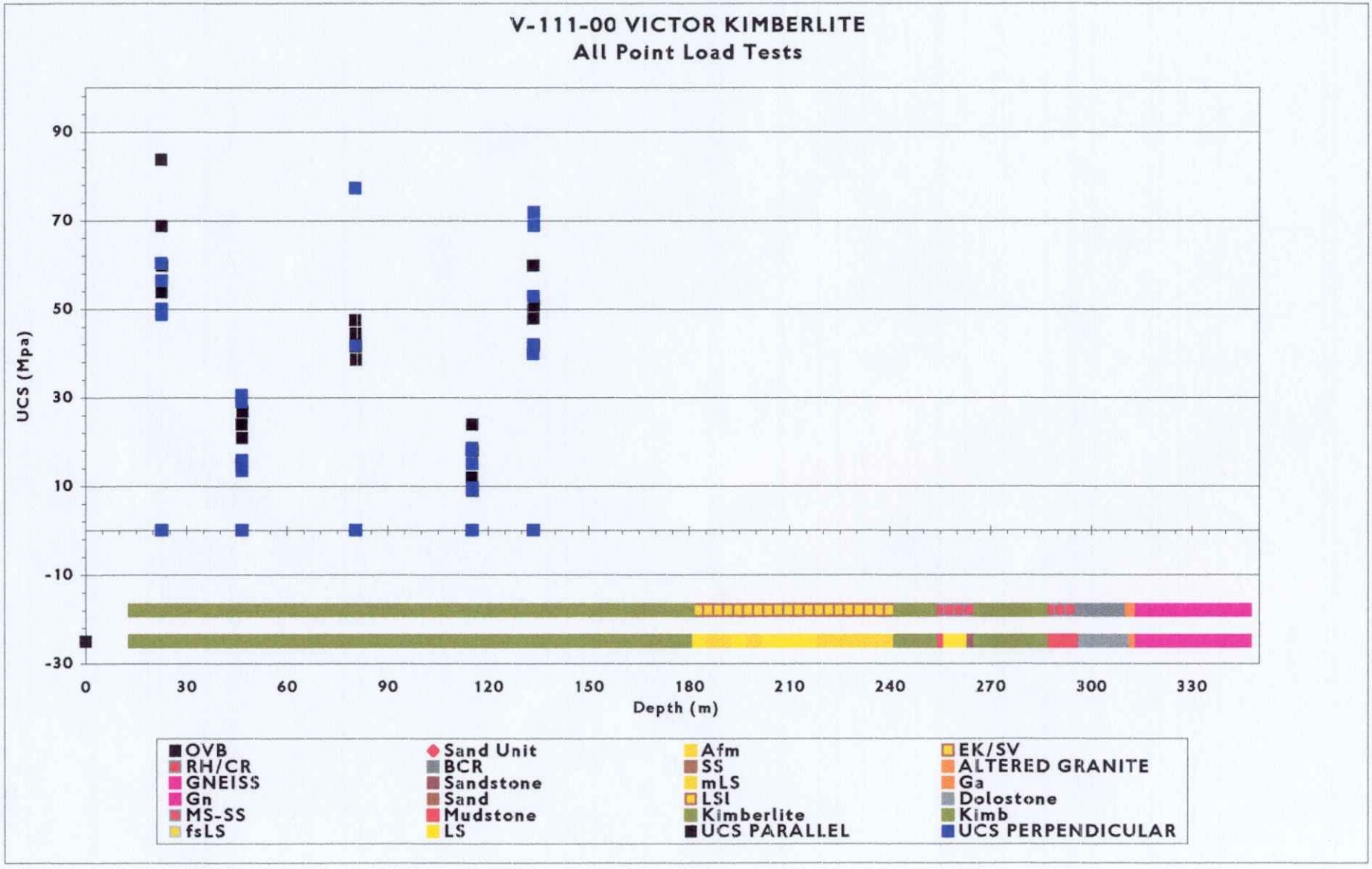
VICTOR 2000
GEOTECHNICAL PROGRAMME



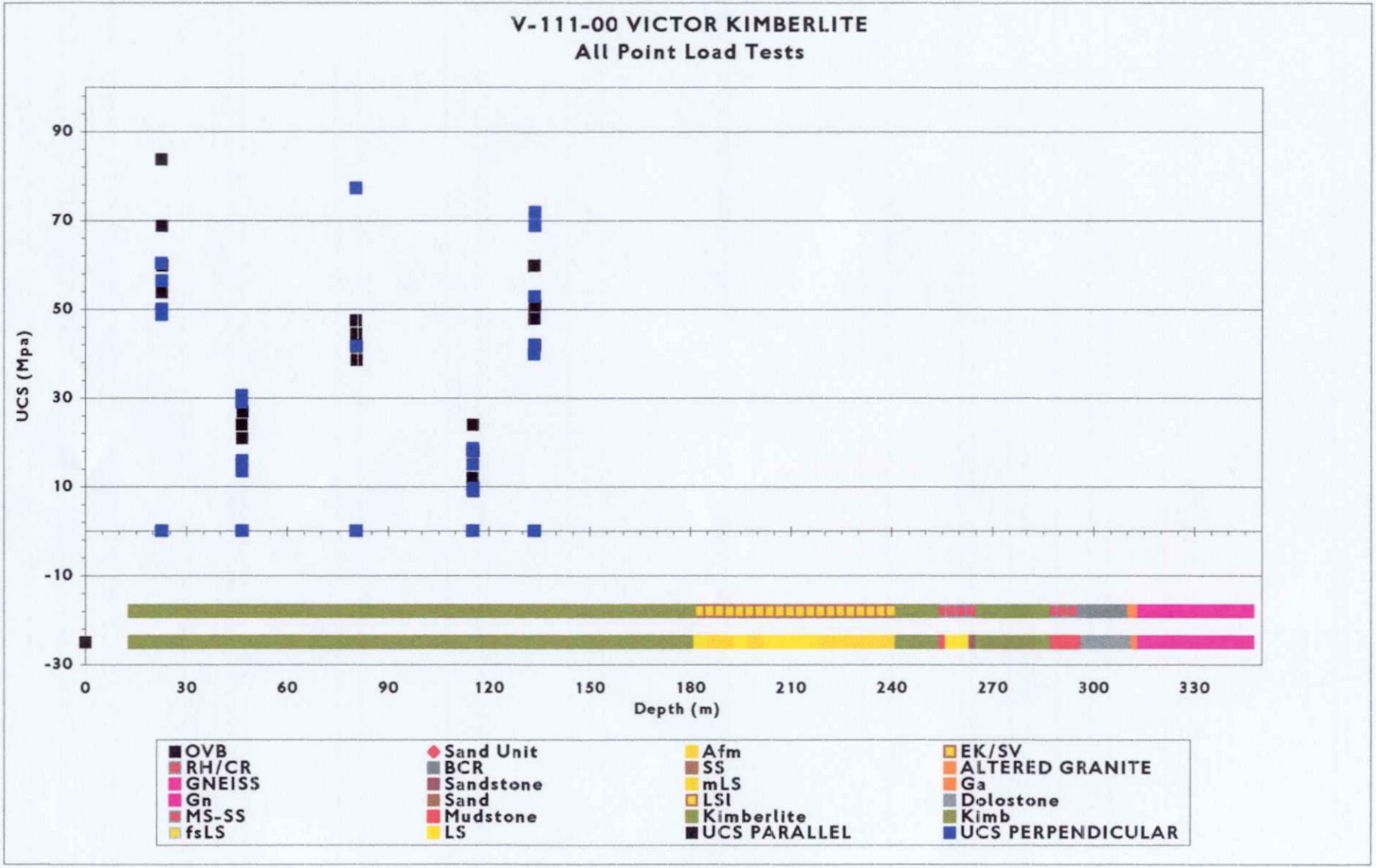
VICTOR 2000
GEOTECHNICAL PROGRAMME



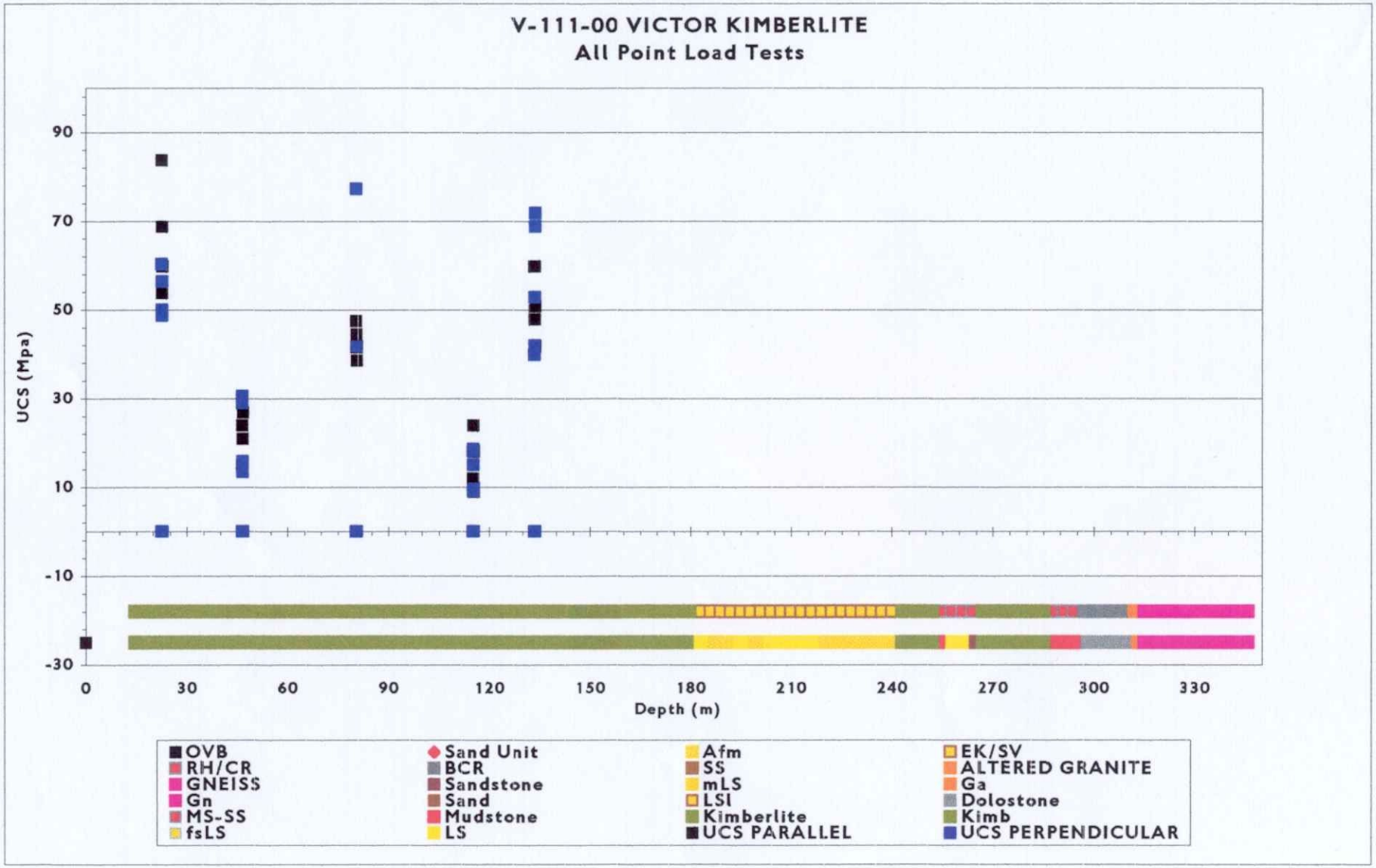
VICTOR 2000
GEOTECHNICAL PROGRAMME



VICTOR 2000
GEOTECHNICAL PROGRAMME



VICTOR 2000
GEOTECHNICAL PROGRAMME



Appendix 3: GEOTECHNICAL PROCEDURES FOR RECOVERING DATA

1.1 GEOTECHNICAL DATA COLLECTION PROCEDURES

Geotechnical data was collected using The Laubscher Mining Rock Mass Classification System (MRMR). The geotechnical programme was planned To drill 6 geotechnical drill holes. The ID numbers that would be used for each drill hole was changed from those submitted in the programme outline Jan 2000.

PLANNED	USED
VGT-01-00	V-97-00
VGT-02-00	V-98-00
VGT-03-00	V-99-00
VGT-04-00	V-100-00
VGT-05-00	V-101-00
VGT-06-00	NOT DRILLED
DELINEATION	V-111-00

Table 1 : Drill hole numbers used for the Victor 2000 project

1.1.1 Collar Locations and Drill Rig Set-ups

Hole Spotting

All drill holes for the geotechnical programme were spotted using a Trimble Pro XRS with RTCM. This unit, using a real-time signal has an accuracy of 1 to 5 metres.

The procedure for spotting the holes occurred as follows:

The GPS was checked for accuracy by taking readings on fixed points in the viscidity of the Victor kimberlite. Two survey points, STA1 and STA 2, located 1.8 Km south of the old Granny Creek Camp had been cemented in to bedrock

in 1998 and serve as permanent markers. Readings from the Trimble GPs were taken and compared to the surveyed marker coordinates before any collars were located. Two collar locations V-60-99 and V-94-00 were also measured with the Trimble system and fell within its accuracy. These collars were positioned using the grid and had post-processed positions calculated by a Magellan base station.

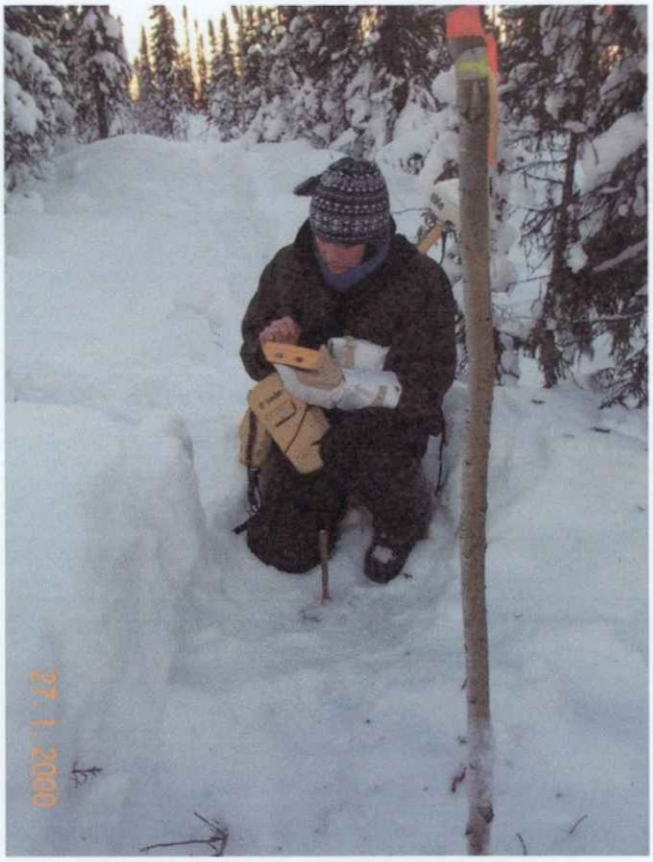


Figure 1 : Permanent Marker STA1 Checking Trimble System

The supervising geologist was present while each rig was set on the collar and aligned with the forests. Azimuths were double checked with a compass after the drill was placed on the setup. Before the drill commenced setting the casing, the dip was checked at the head using either a dip metre or a compass clinometer. Once the casing was set into bedrock and one or two runs of core were recovered a Reflex test was taken to check the Orientation of the drill hole. The Reflex system is a down hole instrument that measures the Azimuth, dip, down hole temperature, and magnetic conductivity at any depth within a borehole. The results were examined on site before drilling would proceed.

Once the borehole was complete a second Reflex test was taken at the bottom of the hole.

Figure 1 : Reflex down hole survey system

		SURVEYED LOCATION		PRO XRS LOCATON		VARIATON (m)	
Check #	Point checked	Northing	Easting	Northing	Easting	Northing	Easting
Check 1	STA1 Marker	5854505.00	305911.10	5854502.45	305915.30	2.55	4.20
Check 2	STA1 Marker	5854505.00	305911.10	5854504.65	305909.68	0.35	1.42
Check 1	STA2 Marker	5854461.90	305864.60	5854459.83	305863.56	2.07	1.04
Check 1	V-60-99	5856079.23	305755.05	5856076.68	305758.16	2.55	3.11

Table 2: GPS accuracy checks. Results show variations in location that are within the ± 5 metre accuracy of the Trimble System used.

1.1.2 Core orientation

A Boart Longyear LF-70 diamond drill using HQ3 and HQ size polycarbonate drill bits was used to complete all drilling. Initial drilling of V-97-00 used the HQ3 drill bit and 1.5m split tubes to take clay impressions for the purpose of orientating the core. The split tubes enabled the recovery of an undisturbed

1.5m section of core. A simple clay imprint core-orienting device was used to gain the reference line (up direction) of core at times during the programme. The flat lying nature of the bedding planes provided a convenient reference for the majority of orientations measured. Drilling with the 1.5m split tubes was very slow. Once the bedding of the formations was confirmed flat lying. Holes V-98-00 and the remaining holes were drilled with a HQ3 drill bit and without the split tubes to increase drilling speed. Clay imprints were still taken to confirm orientation at times during the drill programme. Bedding angles to the core axis were monitored closely for any change in their flat lying characteristic.

1. Orientation procedure using Orientor

An iron bar was welded to the inside of a core tube. This allowed the tube to orient itself as it traveled down the drill string. A core lifter case was also modified to carry clay for the purpose of preserving an imprint. Once it had reached the drill bit the orientor would be held in position by the pump system at 200-300 psi. The head was then lowered to take the imprint. Upon recovery the imprint was brought to the geotech tent and stored until the run was complete. A yellow line was drawn down the centre line of the core to mark the up direction. A dash line was used to mark suspect orientations. Similar orientation instruments have been found to achieve reliable results in drill holes as much as 75°. An accuracy of about $\pm$ 5° can be applied to this instrument (Savely and Call 1980, *Clay Imprint Core Orientor Manual*).

Each orientation device was checked at the start of drilling ensure that proper orientation could be gained. Back orientations were used where ever possible to test the accuracy of the orientation line and the efficiency of the orientor. All drill holes were oriented between 60 and 70 degrees allowing for accurate clay imprints.

2. Orientation using the Bedding Plane

Drill hole V-97-00 was drilled with the intention of testing the orientation of the bedding planes of the various geological formations and groups. The initial assumption that the bedding planes were flat lying was confirmed using Alpha measurements and clay imprints in this vertical drill hole.

The conformation of flat lying bedding allowed the use of the bedding plane to orient core in the remaining angled drill hole. From observations of Alpha angles during this programme it was found that locally around Victor main and Victor Southwest no changes in bedding angles occurred. The maximum ellipse of the core contacting the bedding plane marked the up direction. With flat lying bedding the Alpha angle and the dip of the drill hole would be equivalent. The up direction could be marked as a yellow line connecting these maximums of the ellipse along a section of core.

Figure 2: Clay imprint and orientation line

1.1.3 Geotechnical Data

Data set, describing the structural trends and the Rock Mass Rating (RMR) of the rock units found around the Victor kimberlite was compiled. Using The Laubscher Mining Rock Mass Classification System (MRMR), a DeBeers (as well as an industry) standard, measurements of total core recovery, solid core recovery, rock quality designation, intact rock strength, joint and fracture frequency and joint condition were recorded. Since bedding appears to have a dominant influence on the strength of host rock units the number of open beds were recorded as a relative view of bedding strength. All joints, beds, and areas that showed water staining or the potential of water flowing through them were recorded.

Field point load testing and weathering experiments were conducted throughout the programme. A 3 tonne point load tester was used to determine the intact rock strength of host rock and kimberlite geotechnical units.

Figure 3 : Point Load Tester

1.1.4 Geotechnical Parameters Recorded

Total Core Recovered (TCR)

The total core recovered based on the rigs three-metre drill rod. Variation in the total core recovered by the drill was due to drilling practices, core spring slippage etcR

Solid Core Recovered (SCR)

A measurement of broken core within a geotechnical unit. Measurements were recorded for each three-metre run of core.

Rock Quality Designation (RQD)

Measure of the amount of broken core within a run or in a unit. A measure of all core in a three metre run between natural breaks with a length greater than or equal to ten centimeters. The percent RQD was calculated for a unit based on the TCR for that unit.

Measurements were recorded for each three-metre run of core.

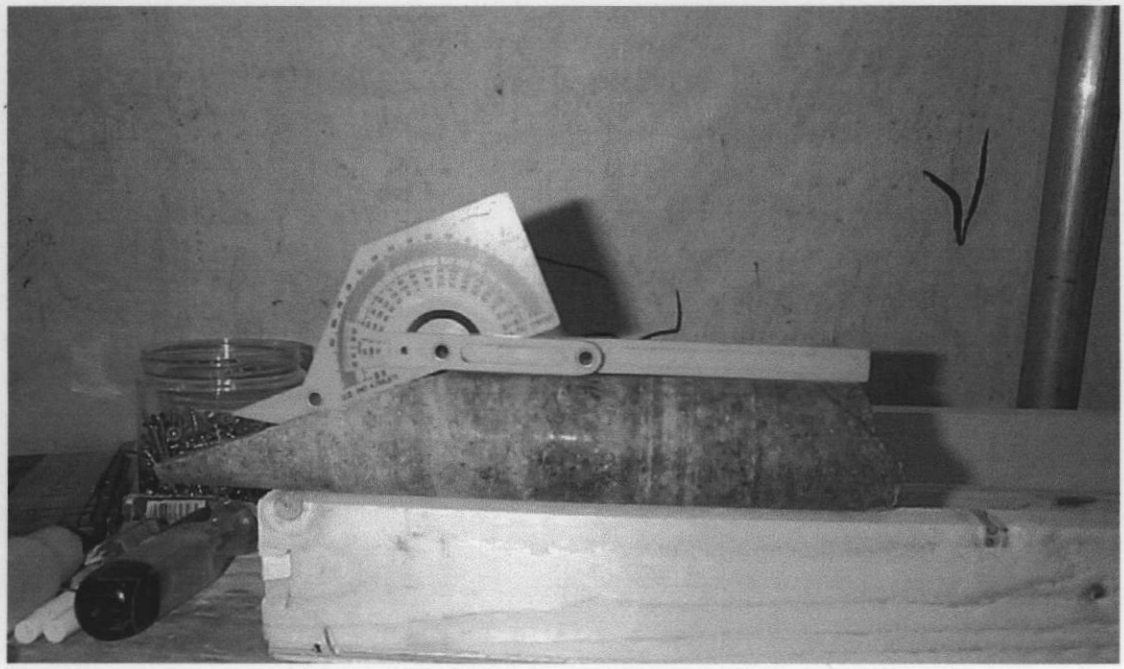


Figure 4: Measuring the alpha angle

Fracture Frequency per metre (FF/m)

All natural open fractures were counted in a three-metre run and then converted to a fracture frequency per metre.

Healed Fractures and Veins per metre (HF/m, Veins/m)

All healed fractures and veins found within a three metre run were recorded, then converted to a per metre basis for each run.

Alpha Angle

A measure of the angle a natural break makes to the core axis. Measured with a carpenters protractor, this angle was recorded for each natural break and closely approximated for healed fractures and veins. All measurements were taken using the top stick of the core. When the top stick was not available the lower stick was measured and converted to the top stick convention before being recorded.

Beta Angle

The angle between the orientation line and the maximum ellipse of a natural break, healed fracture or vein that cuts the core. This angle was measured using a plastic tape scale calibrated for NQ3 or HQ3 size core.

Joint Strength and Condition

Joint roughness was measured with a carpenter's comb then compared to a reference joint condition chart and recorded for each natural break. Joint alteration and the degree of joint infill was recorded with regard to all natural breaks based on Laubscher's reference chart. (Table 2-1)

Point Load Testing

Point load testing is a reliable way to get relatively accurate values for intact rock strength. Further laboratory testing at a future date can confirm or adjust the results.

A one tonne point load tester was used to test the intact rock strength for each unit. Samples underwent a set of 10 tests, 5 diameter tests and 5 axial tests. The results from the tests were corrected for core size and corrected values were used to calculate the Uniaxial Compressive Strength (UCS) with the following formula: UCS = Is(50) * 24. As seen here a conversion factor of 24 was used for obtaining all UCS values. All data recovered from these experiments were placed in the database and summarized in a summary spreadsheet for each hole.

Laboratory perpendicular UCS tests were performed on core from hole V-97-00 at

Interpretation of Data and Field Tests

Once the core was placed in the core shack geotechnical units were defined based on Geological boundaries, fracture frequency and intact rock strength (IRS). Point load testing, core photography and weathering tests were conducted for each borehole. Field results were placed into spreadsheets and linked to summary sheets. Photo interpretation was undertaken to acquire any missing data, clear up inconsistencies and to confirm results. Up dates to the original data were placed in update tables within the spread sheet and no original data was changed.

Structural Interpretation was conducted using DIPS structural analysis software. All files created in dips remain in the database and all files produced from DIPS also remain in the database.

Ontario Ministry of Northern Development and Mines

Declaration of Assessment Work Performed on Mining Land

Mining Act, Subsection 65(2) and 66(3), R.S.O. 1990

Transaction Number (office use): W0060.00330

Assessment Files Research Imaging

tion 65(2) and 66(3) of the Mining Act. Under section 8 of the Mining Act, ent work and correspond with the mining land holder. Questions about this Development and Mines, 3rd Floor, 933 Ramsey Lake Road, Sudbury.

* final revised *

2.20497

ig a claim, use form 0240.

43B13SW2005 2.20497 527834 900

1. Recorded holder(s) (Attach a list if necessary)

Name: Monopros Ltd.	Client Number: 171748
Address: 1 William Morgan Drive	Telephone Number: 416-423-5811
Toronto, Ontario, M4H 1N6	Fax Number: 416-423-0081
Name	Client Number
Address	Telephone Number
	Fax Number

2. Type of work performed: Check (✓) and report on only ONE of the following groups for this declaration.

Geotechnical: prospecting, surveys, assays and work under section 18 (regs) | Physical: drilling stripping, trenching and associated assays | Rehabilitation

Work Type: Drilling "Core" Geology Geotechnical		Office Use: Commodity
		Total $ Value of Work Claimed: 307,472
Dates Work Performed: From Day 04 Month 01 Year 2000 To Day 15 Month 06 Year 2000		NTS Reference
Global Positioning System Data (if available)	Township/Area: BMA 527-834	Mining Division: Porcupine
	M or G-Plan Number: G-1253	Resident Geologist District: Timmins

Please remember to:
- obtain a work permit from the Ministry of Natural Resources as required;
- provide proper notice to surface rights holders before starting work;
- complete and attach a Statement of Costs, form 0212;
- provide a map showing contiguous mining lands that are linked for assigning work;
- include two copies of your technical report.

3. Person or companies who prepared the technical report (Attach a list if necessary)

Name: Monopros Ltd	Telephone Number: 819-824-2444
Address: 185 des Distributeurs	Fax Number: 819-824-2466
~~Name~~ Val d'Or, Quebec	Telephone Number
~~Address~~ J9P 6Y1	Fax Number
Name	Telephone Number
Address	Fax Number

4. Certification by Recorded Holder or Agent

I, Donald R. Boucher (Print Name), do hereby certify that I have personal knowledge of the facts set forth in this Declaration of Assessment Work having caused the work to be performed or witnessed the same during or after its completion and, to the best of my knowledge, the annexed report is true.

Signature of Recorded Holder or Agent: [signature]		Date: 26/07/2000
Agent's Address: 185 des Distributeurs, Val d'Or, Quebec, J9P 6Y1	Telephone Number: 819-824-2466	Fax Number: 819-824-2466

0241 (03/97)

RECEIVED
11:30am
AUG 14 2000
GEOSCIENCE ASSESSMENT OFFICE

5. Work to be recorded and distributed. Work can only be assigned to claims that are contiguous (adjoining) to the minin land where work was performed, at the time work was performed. A map showing the contiguous link must accompany thi form.

AMENDED W0060.00330

	Mining Claim Number. Or if work was done on other eligible mining land, show in this column the location number indicated on the claim map.	Number of Claim Units. For other mining land, list hectares.	Value of work performed on this claim or other mining land	Value of work applied to this claim.	Value of work assigned to other mining claims.	Bank. Value of work to be distributed at a future date
eg	TB 7827	16 ha	$26,625	N/A	$24,000	$2,625
eg	1234567	12	0	$24,000	0	0
eg	1234568	2	$ 8,892	$ 4,000	0	$4,892
1	P 1052172	1	61,165		24,000	37,165
2	P 1052174	1	55,082		24,000	31,082
3	P 1052175	1	110,986		24,000	86,986
4	P 1052176	1	21,845		12,000	9,845
5	P 1052180	1	58,394		24,000	34,394
6	P 1227239	8		12,000		
7	P 1227243	16		24,000		
8	P 1227244	16		24,000		
9	P 1227245	16		24,000		
10	P 1227246	16		24,000		
11						
12						
13						
14						
15						
	Column Totals			108,000	108,000	199,472

I, Donald R. Boucher (Print Full Name), do hereby certify that the above work credits are eligible under subsection 7 (1) of the Assessment Work Regulation 6/96 for assignment to contiguous claims or for application to the claim where the work was done.

Signature of Recorded Holder or Agent Authorized in Writing	Date
Donald R Boucher	14/08/2000

6. Instructions for cutting back credits that are not approved.

Some of the credits claimed in this declaration may be cut back. Please check (✓) in the boxes below to show how you wish to prioritize the deletion of credits:

- ☑ 1. Credits are to be cut back from the Bank first, followed by option 2 or 3 or 4 as indicated.
- ☐ 2. Credits are to be cut back starting with the claims listed last, working backwards; or
- ☐ 3. Credits are to be cut back equally over all claims listed in this declaration; or
- ☐ 4. Credits are to be cut back as prioritized on the attached appendix or as follows (describe):

Note: If you have not indicated how your credits are to be deleted, credits will be cut back from the Bank first, followed by option number 2 if necessary.

For Office Use Only

Received Stamp	Deemed Approved Date	Date Notification Sent
	Date Approved	Total Value of Credit Approved
	Approved for Recording by Mining Recorder (Signature)	

0241 (03/97)

2.20497

RECEIVED
10:35am.
AUG 01 2000
GEOSCIENCE ASSESSMENT OFFICE

Assessment Work Report Geology and Geotech Costs

Personnel	Salary Rate ($/day)	Room & Board Rate ($/day)	Project Planning (days)	Drilling / Logging (days)	Report Writing (days)	Mob-DeMob ($)	Subtotals ($)
Dave Eichenberg	363.00	200.00	17	45	40	2000.00	$ 59,426.00
Deirdre O'donohoe	195.00	200.00	0	48	40	2000.00	$ 36,760.00
Jason Berenyi	195.00	200.00	0	48	0	2000.00	$ 20,960.00
5 - Drillers		200.00				2000.00	$ 11,000.00
Drill						17480.00	$ 17,480.00
							$ 145,626.00

Drilling	Cost/Unit	V-097-00	V-098-00	V-099-00	V-100-00	V-101-00	V-111-99	
Overburden (m)	54.00	22.5	30	15	36	12	12	$ 6,885.00
Core Drilling (0-300m)	50.00	259.5	270	285	264	288	288	$ 82,725.00
Core Drilling (>300m)	60.00	0	12	17.5	27	0	46	$ 6,150.00
Clinometre Dip Tests	65.00	0	4	7	6	4	4	$ 1,625.00
Hourly Rate ($/hr)	100.00	97	59	103.5	24.5	43	3.5	$ 33,050.00
Standby Rate ($/hr)	90.00	10	2.5	0			0.5	$ 1,170.00
Casing (length 1.5m)	130.85	43	33	0	28	8	8	$ 15,702.00
Casing (length 2.0 ft)	74.95	1	0	0	0	0	0	$ 74.95
Casing Shoe (HW)	415.00	0	1	1	1	1	1	$ 2,075.00
HQ Bit	930.00	0		1	0	0	0	$ 930.00
Mud (pail)	132.25	1	1	2	2	2		$ 1,058.00
Bentonite (bags)	8.45	17	18	52	7	21	14	$ 1,090.05
Core Box	9.00	86.5	90	95	88	96	96	$ 4,963.50
Core Box lids	3.35	86.5	90	95	88	96	96	$ 1,847.53
Packer Testing System ($/day)	60.00	6	8	10	5	5	5	$ 2,340.00
Water Line Hose (100 ft)	160	0	1	0	0	0	0	$ 160.00
Subtotals =		$ 32,195.68	$ 28,993.90	$ 30,737.15	$ 25,393.25	$ 22,997.35	$ 21,528.70	**$ 161,846.03**
Personnel Costs Prorated =		$ 28,969.06	$ 26,088.16	$ 27,656.71	$ 22,848.37	$ 20,692.58	$ 19,371.12	
Total Drill Hole Costs =		**$ 61,164.74**	**$ 55,082.06**	**$ 58,393.86**	**$ 48,241.62**	**$ 43,689.93**	**$ 40,899.82**	
							GRAND TOTAL =	**$ 307,472.03**
Claim =		**100% on Claim P1052172**	**100% on claim P1052175**	**100% on Claim P1052180**	**100% on Claim P1052175**	**50% on Claim P1052175 & 50% on Claim P1052176**	**100% on Claim P1052175**	

Ministry of
Northern Development
and Mines

Ministère du
Développement du Nord
et des Mines

Ontario

Geoscience Assessment Office
933 Ramsey Lake Road
6th Floor
Sudbury, Ontario
P3E 6B5

Telephone: (888) 415-9845
Fax: (877) 670-1555

Visit our website at:
www.gov.on.ca/MNDM/MINES/LANDS/mlsmnpge.htm

September 18, 2000

MONOPROS LIMITED
1 William Morgan Drive
TORONTO, Ontario
M4H 1N6

Dear Sir or Madam:

Submission Number: 2.20497

Subject: Transaction Number(s):	W0060.00330	**Status** Approval

We have reviewed your Assessment Work submission with the above noted Transaction Number(s). The attached summary page(s) indicate the results of the review. WE RECOMMEND YOU READ THIS SUMMARY FOR THE DETAILS PERTAINING TO YOUR ASSESSMENT WORK.

If the status for a transaction is a 45 Day Notice, the summary will outline the reasons for the notice, and any steps you can take to remedy deficiencies. The 90-day deemed approval provision, subsection 6(7) of the Assessment Work Regulation, will no longer be in effect for assessment work which has received a 45 Day Notice. Allowable changes to your credit distribution can be made by contacting the Geoscience Assessment Office within this 45 Day period, otherwise assessment credit will be cut back and distributed as outlined in Section #6 of the Declaration of Assessment work form.

Please note any revisions must be submitted in DUPLICATE to the Geoscience Assessment Office, by the response date on the summary.

If you have any questions regarding this correspondence, please contact BRUCE GATES by e-mail at bruce.gates@ndm.gov.on.ca or by telephone at (705) 670-5856.

Yours sincerely,

Steven B. Beneteau

ORIGINAL SIGNED BY
Steve B. Beneteau
Acting Supervisor, Geoscience Assessment Office
Mining Lands Section

Correspondence ID: 15232
Copy for: Assessment Library

Work Report Assessment Results

Submission Number: 2.20497

Date Correspondence Sent: September 18, 2000 **Assessor:** BRUCE GATES

Transaction Number	First Claim Number	Township(s) / Area(s)	Status	Approval Date
W0060.00330	1052172	BMA 527834	Approval	September 15, 2000

Section:
16 Drilling PDRILL

Assessment work credit has been approved as outlined on the AMENDED Declaration of Assessment Work Form accompanying this submission.

Correspondence to:

Resident Geologist
South Porcupine, ON

Assessment Files Library
Sudbury, ON

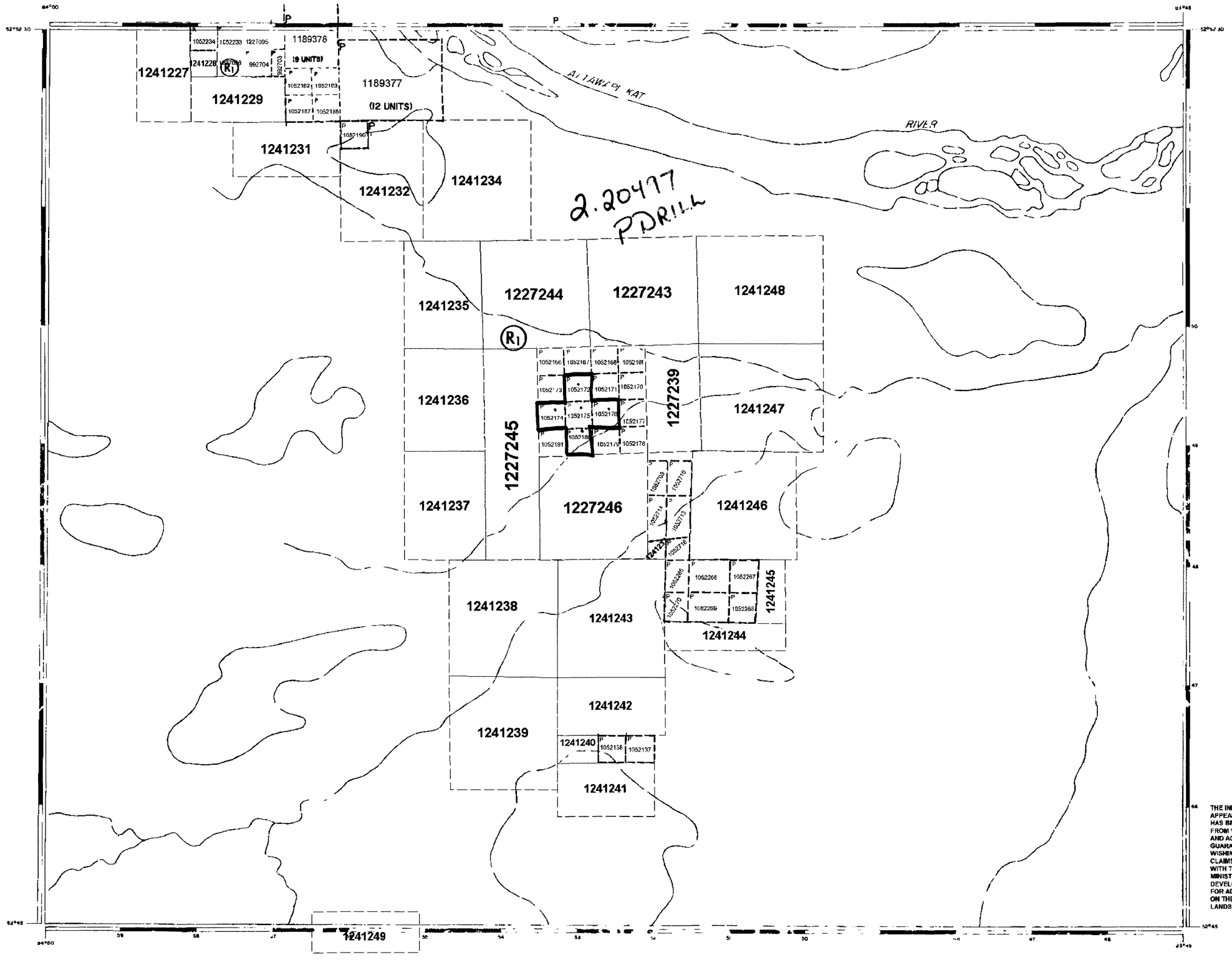
Recorded Holder(s) and/or Agent(s):

Donald Boucher
VAL D'OR, QUEBEC, CANADA

MONOPROS LIMITED
TORONTO, Ontario

Correspondence ID: 15232

528-834



LEGEND

- HIGHWAY AND ROUTE No.
- OTHER ROADS
- TRAILS
- SURVEYED LINES
  - TOWNSHIPS, BASE LINES, ETC.
  - LOTS, MINING CLAIMS, PARCELS, ETC.
- UNSURVEYED LINES
  - LOT LINES
  - PARCEL BOUNDARY
  - MINING CLAIMS ETC.
- RAILWAY AND RIGHT OF WAY
- UTILITY LINES
- NON-PERENNIAL STREAM
- FLOODING OR FLOODING RIGHTS
- SUBDIVISION OR COMPOSITE PLAN
- RESERVATIONS
- ORIGINAL SHORELINE
- MARSH OR MUSKEG
- MINES
- TRAVERSE MONUMENT

DISPOSITION OF CROWN LANDS

TYPE OF DOCUMENT	SYMBOL
PATENT SURFACE & MINING RIGHTS	●
" , SURFACE RIGHTS ONLY	◓
" , MINING RIGHTS ONLY	◒
LEASE, SURFACE & MINING RIGHTS	■
" , SURFACE RIGHTS ONLY	◨
" , MINING RIGHTS ONLY	◧
LICENCE OF OCCUPATION	▼
ORDER-IN-COUNCIL	OC
RESERVATION	(R)
CANCELLED	⊘
SAND & GRAVEL	(S)

LAND USE PERMITS FOR COMMERCIAL TOURISM, OUTPOST CAMPS ◊

NOTE: MINING RIGHTS IN PARCELS PATENTED PRIOR TO MAY 6, 1913, VESTED IN ORIGINAL PATENTEE BY THE PUBLIC LANDS ACT, R.S.O. 1970, CHAP. 380, SEC. 63, SUBSEC 1.

SCALE 1 INCH = 40 CHAINS

FEET 0 1000 2000 4000 6000 8000

METRES 0 500 1000 2000 11 KM 13 KM

AREAS WITHDRAWN FROM DISPOSITION

M R O – MINING RIGHTS ONLY
S R O – SURFACE RIGHTS ONLY
M + S – MINING AND SURFACE RIGHTS

Description	Order No.	Date	Disposition	File
(R) Sec.35	W-P-16/00	29/03/2000	S+M	195150

THE INFORMATION THAT APPEARS ON THIS MAP HAS BEEN COMPILED FROM VARIOUS SOURCES, AND ACCURACY IS NOT GUARANTEED. THOSE WISHING TO STAKE MINING CLAIMS SHOULD CONSULT WITH THE MINING RECORDER MINISTRY OF NORTHERN DEVELOPMENT AND MINES. FOR ADDITIONAL INFORMATION ON THE STATUS OF THE LANDS SHOWN HEREON.

RECEIVED DECEMBER 1, 1987

AREA

527-834

M.N.R. ADMINISTRATIVE DISTRICT

MOOSONEE

MINING DIVISION

PORCUPINE

LAND TITLES / REGISTRY DIVISION

KENORA/PATRICIA PORTION

Ontario Ministry of Natural Resources | Ministry of Northern Development and Mines

Date NOVEMBER 1987

Number G-1253

43B13SW2005 2.20497 527834 200