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Report on Sapphire Bulk Testing program - SEL
22/1999 - NE Tasmania
Great Northern Mining Limited; Mineral Holdings Austr
Kinnane, N.R. SEL22/1999

GREAT NORTHERN MINING LIMITED

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REPORT

SAPPHIRE BULK TESTING PROGRAM

SEL 22 / 1999

NORTH EAST TASMANIA

MINERAL HOLDINGS AUSTRALIA PTY., LIMITED

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PREPARED BY:

Niugini Resources Pty., Limited.

DATE PREPARED:

9th August 2001

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1 OVERVIEW

In order to further test for the presence of sapphire in recent alluvial deposits within SEL 22/1999 Great Northern Mining Limited (GTN) has planned and executed a seven hole bulk sampling and sample processing program at three locations, Priory (George River), Weld River and Spinel Creek.

Sampling in the Priory area was originally planned to be carried out in recent alluvial terrace gravels flanking the George River downstream of Ansons Bay Road. A site inspection indicated that the sites selected were covered by a thick layer of sands derived from tailings of alluvial tin mining upstream from Priory and the target was thus changed to a sequence of "Older" high level Tertiary alluvials occurring well above and away from the River. Three pits were excavated and a 1.1 m³ sample from each, combined on the truck, and transported to Spinel Creek to stockpile. Subsequent treatment of samples yielded some cassiterite concentrates and only two small sapphires, these probably being derived from a surface sandy horizon in hole P3.

Two holes were excavated in the Weld River alluvial terraces above the junction of Spinel Creek. One hole, W1, nearest the river, failed to reach bedrock, excavation being stopped by large boulders and very large volumes of water entering the hole. Hole W2 near the road encountered shallow ground. Samples from each hole were stockpiled at Spinel Creek for treatment. Both holes yielded cassiterite and spinel concentrates however only hole W2 yielded any sapphire.

Two holes were excavated at Spinel Creek, both encountered disturbed (previously mined) ground. One Hole SPCK2 yielded minor sapphire.

2 TESTING PROGRAM

2.1 RECONNAISSANCE

In late 2000 Great Northern carried out two reconnaissance field inspections within the tenement. These were aimed at locating and defining areas in which prospective sapphire bearing alluvial deposits might be located.

The first period of field work conducted by the author was aimed at determining the overall distribution of sapphire within the tenement. Sites were inspected on the basis of their proximity to original gem source rock (considered to be an older high level Tertiary basalt) and the potential of the area to deliver a resource having the correct economic size and grade parameters. In all six areas were located that filled these criteria, specifically:

- The Priory area near St Helens;
- Spinel Creek in the Weld River watershed;
- The upper Weld River above Spinel Creek;
- The lower Weld River;
- The Winiford River; and
- The upper George River.

In December 2000, Peter Schipp, representing the company, undertook a further inspection aimed at selecting six bulk sample sites. He defined three areas as potential bulk sampling sites, specifically:

- Two sites in old Tertiary deposits in the Priory area north of St Helens;
- Two sites in the Spinel Creek alluvial system; and
- Two sites in the terraces flanking the Weld River above Spinel Creek.

In the first quarter of 2001 Mr. Ron Lawry of St Helens, on behalf of the company, approached a number of landowners in each of the areas in order to secure access agreement for the bulk sample collection program. Access to the first site at Priory was delayed and it proved necessary to relocate the sites further downstream into a property owned by Mr. Derek Chapple (See Figure 1). Lawry was able to negotiate access for the four sites in the Weld watershed with one landowner. Mr. Wes Singline.

Application was made to the Department for authority to excavate six bulk sites, that approval was received on the 25th July 2001 and sampling commenced shortly afterwards.

2.2 BULK TESTING PROGRAM

An initial six hole bulk sampling program was proposed for the Licence. Holes were to be excavated using a small tracked machine, in this case a CAT E70B (See Photo 1), and loaded onto a truck for transport to stockpile. The samples from Priory were combined into one lot and trucked across the Weld Pass to Spinel Creek.



PHOTO 1 - EXCAVATING SAMPLE AT HOLE P1 (PRIORY).

Samples were treated through a small mobile Max-I-Weld treatment plant comprising a feed bin, trommel, two hutch Dorr Olivor type jig and sluice box. At the completion of each sample the jig bed material was removed, screened and hand picked for sapphire and zircon. Gem minerals were subsequently weighed and reported as gm / loose cubic metre corundum. Sluice box concentrates were removed and bagged for storage.



PHOTO 2 - TREATMENT PLANT AND STOCKPILES AT SPINEL CREEK.

Results of pitting are presented as a series of pictorial lithologic logs, Appendix 5.1 and sample data as Appendix 5.2.

In addition to bulk samples the wash horizon in each pit was channel sampled, a sample volume of 0.006 m³ being collected, dished to a concentrate, the concentrate checked for gem component and subsequently bagged for retention. All jig / sluice concentrates and dish concentrates are held by representatives of Mineral Holdings Australia Pty., Limited.

3 RESULTS OF THE PROGRAM

3.1 PRIORY AREA, ST HELENS DISTRICT

Three holes were to be excavated in recent alluvium around the Priory area, a 1 m³ sample collected from each hole and combined into one 3 m³ bulk for transport to Spinel Creek for processing.

A site inspection prior to excavation indicated that the recent (low level) river terraces are covered with up to 3 metres of sand, recent deposition by the river of old tin mine tailings derived from well upstream of Priory. Field traverses located three areas of "Older" (high level) Tertiary alluvium situated well above and away from the present stream system. In order to reduce cost and time required to move machinery it was decided to excavate three holes approximately 50 metres apart along one of the high level deposits at the Chapple property ("Priory"). See Figure 1.

The three holes were located on the side of a low hill currently occupied by Priory Homestead. The surface of the hill is covered by a thin layer of sandy black soil containing rounded, river worn, pebbles and small cobbles. Excavation of the test pits indicated that this surface material is not representative of the underlying horizons. All three holes encountered thick clayey sand to sandy clays, varying from 1.2 to 3.3 metres in thickness overlying a sequence of cobbly to bouldery, mature, well-rounded, river gravels. The gravely horizon varies in thickness from a thin 1.2 metre horizon in Hole P 3, 2.3 metres in Hole P 2 to an un-bottomed horizon 1.5 metres in thickness in Hole P 1. In hole P 3 the surface soils were immediately underlain by a thin, 0.9 metre horizon consisting of loose grey to reddish-grey granite derived sandy to gravely wash that sits immediately on the older gravels.

The combined bulk sample yielded abundant cassiterite in the jig / sluice concentrate however there was only a minor spinel / corundum content, two pale blue sapphires being recovered from the jig bed material. Inspection of the pan concentrates indicated that only the surface sandy gravels in Hole PR 3 contained spinel and sapphire, the deeper wash horizon appears to be stanniferous but devoid of gem material.

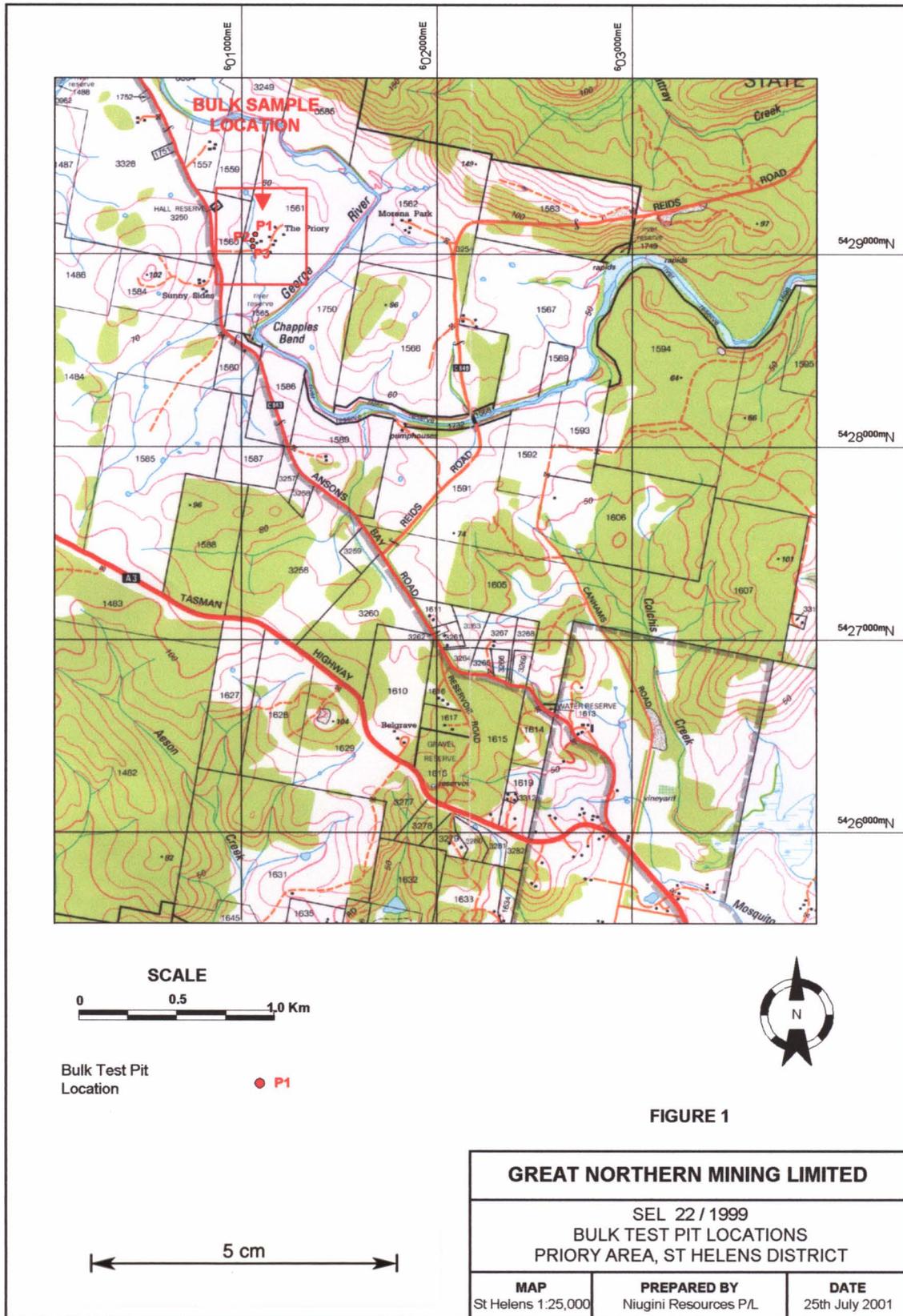




PHOTO 3 CHAPPLE FARM HIGH LEVEL ALLUVIAL ZONE.



PHOTO 4 EXCAVATING PRIORY HOLE P 3.

3.2 WELD RIVER, WELDBOROUGH DISTRICT

The original program allowed for the excavation one pit in the alluvial terraces of the Weld River above its confluence with Spinel Creek. Hole W 1 was located approximately 40 metres west of the Weld River as depicted on Figure 2. The hole encountered a basaltic derived profile consisting of a thin enriched reddish topsoil overlying a 0.4 metre red-brown silty volcanic clay horizon in turn overlying a very wet horizon consisting of rounded, basalt cobble and boulder based alluvial. See Photo's 5 and 6.



PHOTO 5 PROFILE TO TOP OF WASH IN WELD HOLE W1.

The excavator was unable to penetrate to basement, the 1.2 metre thickness of bouldery alluvium was coarsening downward and heavy water inflow was encountered. See the lithologic log appearing as Appendix 5.1. The bulk sample of 0.55 m³ yielded some cassiterite in the jig / sluice concentrate however very little spinel and no gem material was recovered from on top of the jigs. Minor spinel, some cassiterite and no sapphire were recorded in the pan concentrate.

It was decided to attempt to excavate a second pit further away from the river. See Figure 2.

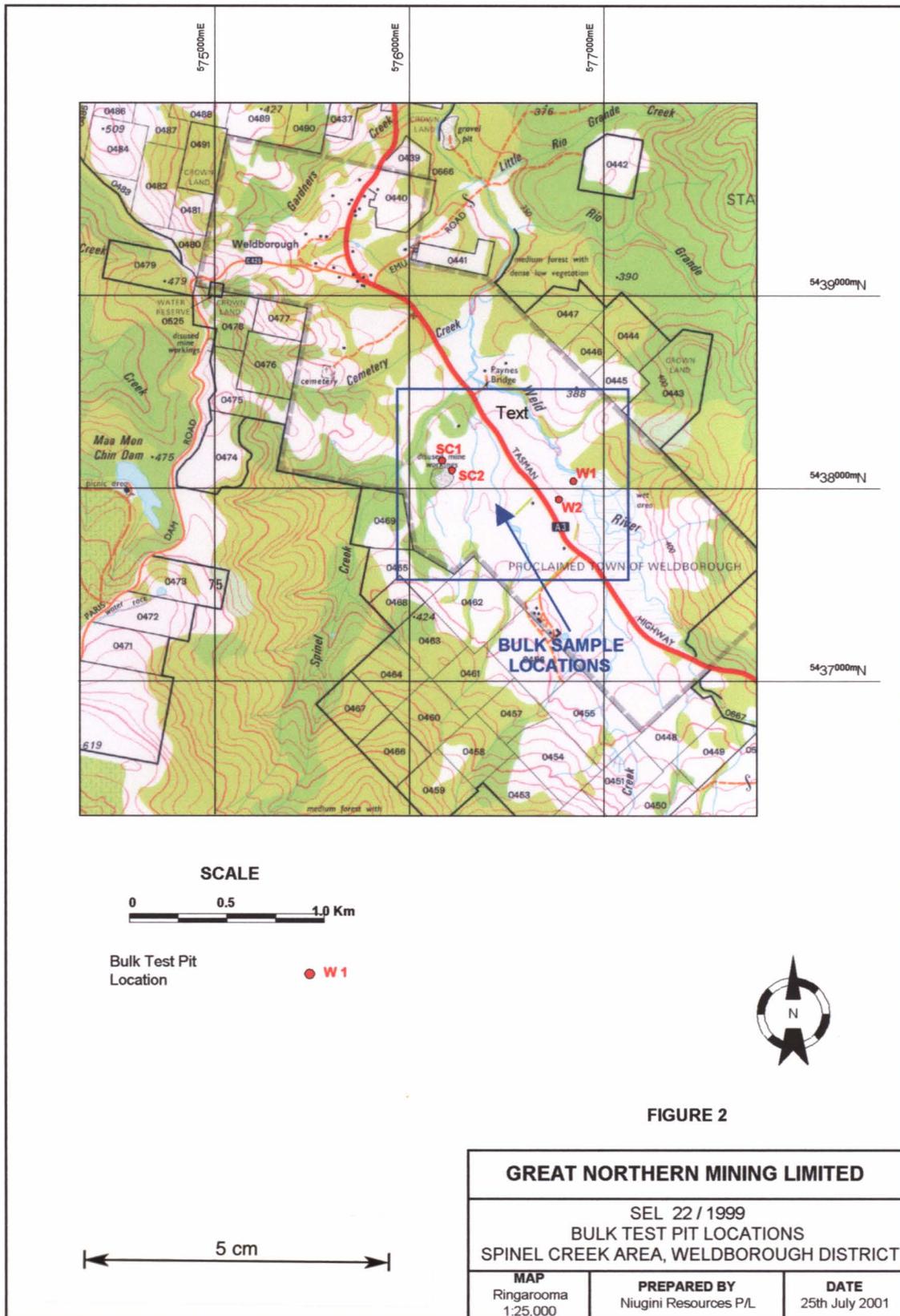




PHOTO 6 BASALTIC WASH STOCKPILE AT HOLE WELD W1.

Hole W2 encountered shallow ground and granite basement with basically the same lithologic profile as Hole W 1 however the cobble / boulder layer was not as coarse nor was it as thick as that encountered in the first hole. Treatment of the 0.57 m³ bulk sample yielded fine cassiterite and significantly more spinel and 0.5 grams of corundum / sapphire.

3.3 SPINEL CREEK, WELDBOROUGH DISTRICT

It was planned to excavate two holes in the Spinel Creek watershed. The material encountered in the two holes proved to be disturbed ground comprising basaltic soil, rounded basalt and granite cobbles resting on decomposed granite basement. Both holes contained minor cassiterite and only minor spinel. 0.04 grams of corundum was recovered from hole SC 2.

3.4 RECLAMATION AND RESTORATION

During the excavation program the topsoil horizon from each hole was removed to a discrete stockpile and all lower horizons excavated to a second heap. Following completion of sampling the lower horizon was pushed back into the hole and compacted as much as possible. The topsoil layer was then pushed over the site, further compaction carried out and finally the site smoothed back to as close to the original surface as possible.

At Priory the holes were excavated in ploughed ground and thus extensive surface reclamation was not necessary. At the Weld site holes were excavated in cultivated grassed paddocks and it proved necessary to spread grass seed over the site following levelling of the surface.

The Spinel Creek sites were backfilled and a cover of native vegetation, including bark and seeds, spread over the holes. The treatment plant site was located in an old mine cut and tailings were retained in the mine cut. No discharge of muddied water into the present drainage occurred. At completion of processing the site was roughly levelled.



PHOTO 7- HOLE WELD W1 RECLAIMED AFTER EXCAVATION.

4 CONCLUSIONS

The sapphire source within the tenement appears to be the older Tertiary basalts that originally capped the Blue Tier tin bearing granite bodies. It is assumed that the basalts were the first units eroded and thus are now probably represented by deeper buried older Tertiary alluvium. Current drainage systems appear to have intersected at least part of the older sapphire bearing channels.

It is clear that the coarse sapphire observed in personal collections at Priory is not derived from the sequence tested. There are clearly a number of different alluvial units present in the Priory - St Helens district, many of those are sapphire deficient. The George River system is a major erosional channel for sediment derived from the Blue Tier and areas to the south west of the Tier but given the active erosional nature of the River around Priory it is likely that many of the older sapphire deposits are now almost fully eroded.

Reasonably extensive low-level terraces have been developed along the Weld River above its confluence with Spinel Creek and while results were disappointing there is some evidence to suggest that the deeper, more bouldery horizons, may contain sapphire. In order to test these deposits it would be necessary to use a larger excavator and excavate larger sample volumes. While this is practical any sapphire deposits located in such horizons would present serious mining operational difficulties to the extent that commercial recovery would be highly unlikely.

Testing at Spinel Creek established that there is little remaining undisturbed alluvium (previously mined) present in the drainage system. Further work in that system is not recommended.

It is considered that the combination of:

- i Low value of the stone due to extremely small size distribution of all samples taken from either virgin or worked ground;
- ii Limited areal extent of prospective terraces;
- iii Poor recoveries from bulk testwork in the most prospective targets.

diminishes the likelihood for the discovery of economic sapphire occurrences. Sapphire is not considered likely to occur in significant quantities to support a "stand alone" sapphire operation but could prove to be a valuable by-product for any tin mining operation.

5 EXPENDITURE STATEMENT

During the first twelve months of tenure Great Northern Mining Limited expended a total of \$41,105.00. A breakdown of that expenditure appears as Table 1.

TABLE 1**EXPENDITURE FOR YEAR 1**

CATEGORY	EXPENDITURE	NOTES
Geology	\$26,025.00	Includes deskwork, field work, analysis and assay
Pitting	\$11,880.00	Includes site selection, mobilization, equipment hours, labour, hire charges, technical supervision
Administration	\$3,200.00	Includes office charges, presentation, etc.
TOTAL	\$41,105.00	

6 APPENDICES**6.1 LITHOLOGIC LOGS**

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ALLUVIAL LITHOLOGIC AND SAMPLING LOG

PROJECT: PRIORY AREA				GEOLOGY: N. KINNANE				DATE: 30th July 2001			
PIT NO	INTERSECTION			LITHOLOGY	LITHOLOGIC LOG	SAMPLE NUMBER	SAMPLE INTERVAL m	SAMPLE VOLUME LCM	SAMPLE DESCRIPTION		
	FROM m	TO m	INT m								
PRIORY PIT NO 1	0	0.2	0.2	█	Black topsoil with minor pebbles	P 1	3.5 to 5.0	1.1	P 1 - pebbly to cobbly yellow mature well rounded clasts of metasediments and granite in a sandy matrix. <i>P1 - 0.006 m3 channel from 3.5 to 4.5 m interval.</i> <i>P2 - 0.006 m3 channel from 4.0 to 5.0 m interval.</i> <i>P3 - 0.006 m3 channel from 5.0 to 5.3 at basement</i> <i>P4 - 0.006 m3 channel from basal 0.5 m</i>		
	0.2	3.5	3.3	█	Yellow-brown to yellow clay becoming more sandy with depth and grading into a clayey sand with minor pebbles						
	3.5	5.0	1.5	█	Yellow-brown pebbly to cobbly alluvial wash, clasts derived from Mathinna Formation metasediments and granites. NOT TO BASEMENT						
PRIORY PIT NO 2	0	0.2	0.2	█	Black topsoil with minor pebbles	P 2	2.4 to 4.7	1.1	P 2 - cobbly well rounded mature alluvial wash containing clasts of metasediments and granite. <i>P5 - 0.006 m3 channel from basal 0.5 m layer.</i>		
	0.2	2.4	2.2	█	Yellow to yellow-brown sandy clay becoming more sandy with depth						
	2.4	4.7	2.3	█	Cobbly and pebbly alluvial gravels with a sandy clay matrix						
	4.7			█	Oxidised granite basement						
PRIORY PIT NO 3	0	0.2	0.2	█	Black sandy topsoil with abundant pebbles	P 3	0.2 to 2.3	1.1	P 3 - sample of complete interval including both types of alluvium. <i>P6 - top 0.2 to 0.8 m interval, 0.006 m3 channel.</i>		
	0.2	1.1	0.9	█	Friable grey to reddish-grey, mottled sandy and pebbly alluvial gravel, granite derived						
	1.1	2.3	1.2	█	Yellow to yellow-grey mottled clay with some pebbles and boulders.						
	2.3			█	Oxidised granite basement						

SAMPLE P1 - Bulk sample P1 is a combination of P 1, P 2 and P 3 from these three holes and measured 3.3 loose cubic metres.

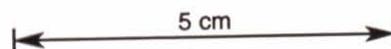
Samples P1 to P6 represent 0.006 loose cubic metre volumes and were dished to concentrate and checked for the presence of sapphire.

←————— 5 cm —————→

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ALLUVIAL LITHOLOGIC AND SAMPLING LOG

PROJECT: SPINEL CK AREA				GEOLOGY: N. KINNANE		DATE: 31st July 2001			
PIT NO	INTERSECTION			LITHOLOGY	LITHOLOGIC LOG	SAMPLE NUMBER	SAMPLE INTERVAL m	SAMPLE VOLUME LCM	SAMPLE DESCRIPTION
	FROM m	TO m	INT m						
SCRK PIT NO 1	0	1.0	1.0	*	Rubbly red volcanic derived soil with cobbles and boulders, disturbed ground	SC 1	0 to 1.0	0.60	SC 1 - silty reddish volcanic derived soils with cobbles and boulders of basalt and granite
	1.0			+	Granite basement				
SCRK PIT NO 2	0	1.0	1.0	*	Rubbly red volcanic derived soil with cobbles and boulders, disturbed ground.	SC 2	0 to 1.0	0.55	SC 2 - silty reddish volcanic derived soils with cobbles and boulders of basalt and granite
	1.0			+	Granite basement				



6.2 SAMPLING RESULTS

