ASSESSMENT REPORT- 2000 EXPLORATION PROGRAM

KEMESS PROPERTY:

DIAMOND DRILL AND GEOPHYSICAL PROGRAMS

OMENICA MINING DIVISION
BRITISH COLUMIA

CENTERED ON:

LATITUDE: 57° 00′ North
LONGITUDE: 126° 50′ WEST

NTS 94E/2 & 94D/15

-By-

Northgate Exploration Ltd.
#9-3167 Tatlow Road
P.O. Box 3519
Smithers, B.C.
V0J-2N0

FEBRUARY, 2001

Adrian D. Bray
B.Sc.H.

Brett Lapeare
B.Sc.

1.0 EXECUTIVE SUMMARY

The Kemess property is located approximately 250 kilometres north of Smithers in north-central British Columbia, in the South Toodoggone mining camp of the Omineca Mining Division. This report highlights the diamond drilling and geophysical programs on the Kemess property for the period of May 1st to December 7th, 2000.

A total of 5,433.91 metres of diamond drilling were perforated in seventeen holes; four holes were drilled on the Kemess Centre target area, one stratigraphic hole in the Kemess South Mine and twelve holes on the Kemess North deposit. A total of 2,373 samples were collected for fire assay gold and ore grade copper analyses. Seventy-five samples were submitted for 32-element ICP. Six and one-half line kilometers of induced polarization, resistivity, magnetic field strength and gamma ray spectrometry surveys were conducted on the Kemess Centre target.

Diamond drilling and geophysics were employed to test for new areas of porphyry-type mineralization at the Kemess Centre target. At the Kemess South Mine, a diamond drill hole was perforated on the western extremity of the open pit in order to provide a better understanding of the stratigraphy and structure in an area that has received only limited historical drilling. The objectives of the diamond drilling on the Kemess North deposit were:

a) to infill significant gaps in the previous drilling in order to enable a more precise ore resource calculation
b) to define and test for higher grade zones
c) to gain intersections at various depths for specific gravity and metallurgical testing

A detailed description of the Kemess South Mine and Kemess North deposit by Rebagliati et. al., 1995 is provided as an overview to the reader. The year 2000 diamond drilling exploration program outlined a new high-grade porphyry system to the east of the known Kemess North deposit, at 200 m below surface. Together with previous exploration data, the year 2000 exploration program has defined a geological resources of 360 million tonnes grading 0.154% Cu and 0.299 gAut. Further diamond drilling and geophysical program are recommended in order to test the newly discovered porphyry system and to evaluate the mineralization potential at northeast edge of the Kemess North deposit.

Diamond drilling at the Kemess Centre target intersected lithologies, alteration and mineralization, which may be indicative of a proximal intrusive body and fluid source. One diamond drill hole is recommended to evaluate a previously defined IP anomaly.

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2.0 INTRODUCTION

The Kemess property, owned by Northgate Exploration Ltd., is located approximately 250 kilometres north of Smithers in north-central British Columbia. The 77,000-acre property is comprised of 185-staked mineral claims and 1 mining lease, and is in the Southern Toodoggone mining camp of the Omineca Mining Division.

Vehicle access to the property is via the Omineca Resource Access Road. A 1,600 metre airstrip, located approximately 1,600 metres southwest of the main Kemess South Mine site, provides fixed-wing commuter air access from Prince George and Smithers.

The property is situated in a mineral rich area with extensive overburden. Several regional lineaments suggest promising exploration potential. However, due to thick overburden the area has received only minimal exploration work. Rebagliati et al., 1995, have suggested that the area has the potential to host any one of the following styles of mineralization:

- shear-hosted Au deposits
- Sustut copper deposit style Cu mineralization
- stockwork and replacement Au-Cu deposits in Sustut Group sediments related to Eocene Katsberg felsic intrusions
- porphyry Cu, Cu-Au-Mo plugs related to Jurassic, Cretaceous and Tertiary felsic plutons
- volcanogenic deposits related to subaqueous Triassic/Jurassic volcanics

The exploration program on the Kemess Centre prospect consisted of 6.5 kilometres of magnetic, radiometric, induced polarization and resistivity geophysical surveys by Delta Geoscience Ltd., and a four-hole diamond drill program totaling 1,015 metres. Grids and trails were established to access this prospect. Twelve HQ/NQ diamond drill holes totaling 4,104.50 metres were drilled on the Kemess North deposit. One stratigraphic drill hole totaling 314.46 metres was drilled at Kemess South, on the western pit of the mine. Drill core is stored on site at the Kemess South Mine. A total of 2,373 drill hole samples were submitted to ASL Chemex and Assayers Canada for fire assay gold and ore grade copper analyses. ASL Chemex conducted ICP analyses on 75 drill hole samples.

3.0 LOCATION AND ACCESS

The Kemess property is located in the Quesnel Trough of north-central British Columbia, approximately 250 kilometres north of Smithers, and is centered on latitude 57° 00' north, longitude 126°50' west in the Omineca Mining Division, NTS sheet 94E/2 and 94D/15 (Figure 1). Access to the property is from Fort St. James or Mackenzie via the Omineca Resources Access Road, or via fixed-wing commuter aircraft to the Kemess South Mine airstrip.

The Kemess property lies in the Artic drainage system on the western margin of the Swannell Range of the Omineca Mountains, at the transition to the more gentle terrain of the Bowser Basin and Spatsizi Plateau. Topography within the property ranges from very moderate rounded terrain to steep rocky bluffs. Elevations range from 1,200 to 1,900 metres. At the Kemess South Mine the topography is gentle with 5° to 15° south-southwest facing slopes. The Kemess North deposit lies within a broad cirque, open to the north, and bound by moderate ridges to the east and west, and is confined by a steep headwall to the south. A mixed subalpine coniferous forest of spruce, fir and lodgepole pine covers most of the claims. Above 1,500 m in elevation the subalpine forest gives way to alpine vegetation. A 1 to 2 m thick peat layer, supporting willow and alder bushes and scattered stunted spruce trees, characterizes local areas of poor drainage.

The climate is generally moderate, although highly changeable. Temperatures range from +30° to –35° Celsius. Precipitation, at 890 mm per year, is also moderate and is more or less uniformly distributed throughout the year.

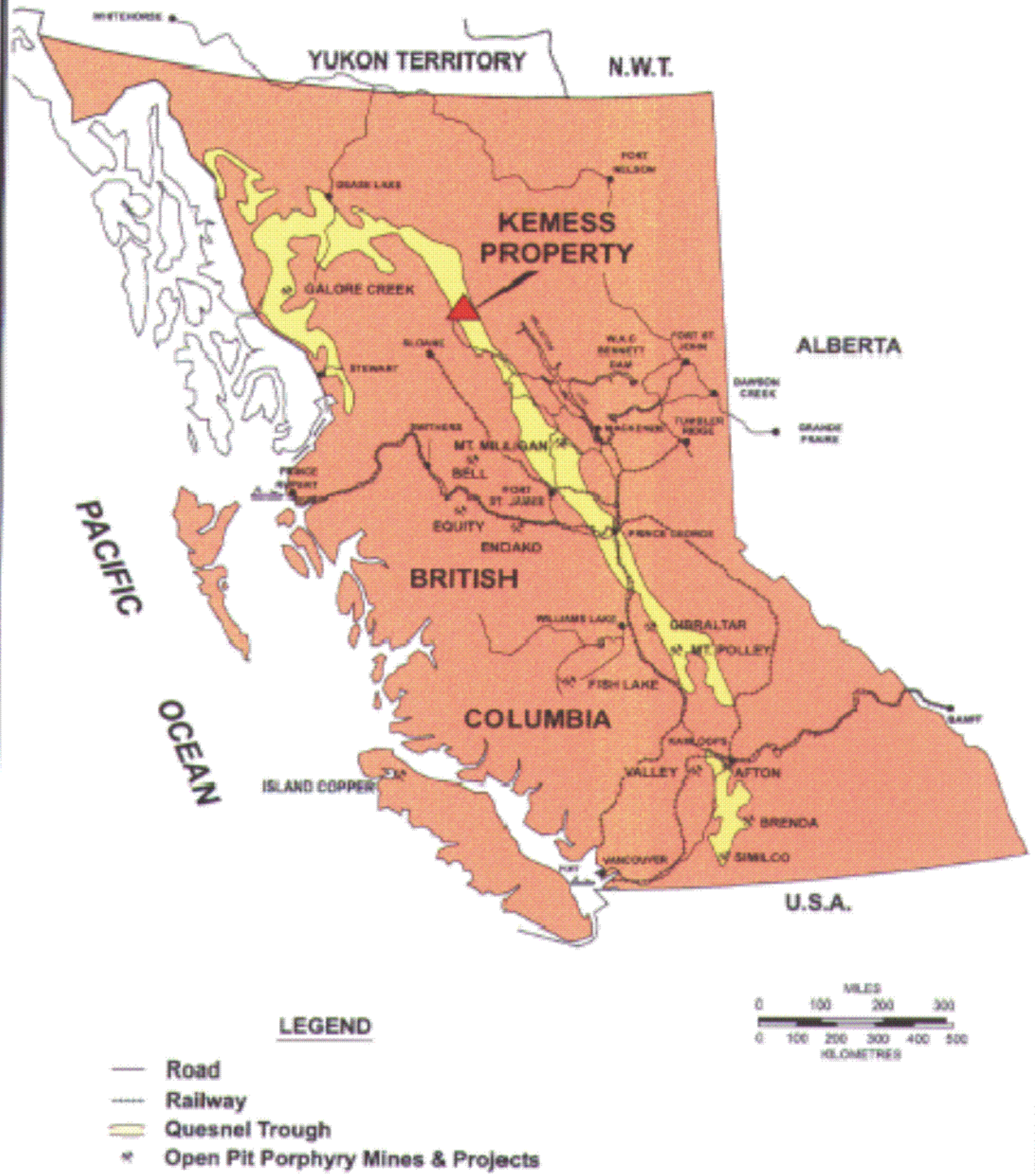

FIGURE 1: KEMESS PROPERTY LOCATION MAP

4.0 CLAIM DATA

The Kemess properties consists of 185 staked mineral claims and 1 mining lease on Crown Lands covering an area of approximately 26,075 hectares. The claims are situated in the Omineca Mining Division of British Columbia on NTS map sheets 94E2W, 94E2E, 94D15W and 94D15E.

Pertinent claim information is outlined in Table 1, with the generalized claim boundaries and property grid illustrated in Figure 2. Individual claims are shown more specifically in Figure 3.

Table 1: Claim Information

CLAIM	TENURE #	TAG #	MAP NUMBER	STATUS	UNITS	HECTARES	ACRES
Aero 1	343151	665841M	094E02W	15-Dec-01	1	25	61.78
Aero 10	343160	665850M	094E02W	15-Dec-01	1	25	61.78
Aero 2	343152	665842M	094E02W	15-Dec-01	1	25	61.78
Aero 3	343153	665843M	094E02W	15-Dec-01	1	25	61.78
Aero 4	343154	665844M	094E02W	15-Dec-01	1	25	61.78
Aero 5	343155	665845M	094E02W	15-Dec-01	1	25	61.78
Aero 6	343156	665846M	094E02W	15-Dec-01	1	25	61.78
Aero 7	343157	665847M	094E02W	15-Dec-01	1	25	61.78
Aero 8	343158	665848M	094E02W	15-Dec-01	1	25	61.78
Aero 9	343159	665849M	094E02W	15-Dec-01	1	25	61.78
Air 1	315248	635301M	094E02W	15-Dec-01	1	25	61.78
Air 10	315257	635310M	094E02W	15-Dec-01	1	25	61.78
Air 11	315258	635311M	094E02W	15-Dec-01	1	25	61.78
Air 12	315259	635312M	094E02W	15-Dec-01	1	25	61.78
Air 13	315260	635313M	094E02W	15-Dec-01	1	25	61.78
Air 14	315261	635314M	094E02W	15-Dec-01	1	25	61.78
Air 15	315262	635315M	094E02W	15-Dec-01	1	25	61.78
Air 16	315263	635316M	094E02W	15-Dec-01	1	25	61.78
Air 17	315264	635317M	094E02W	15-Dec-01	1	25	61.78
Air 18	315265	635318M	094E02W	15-Dec-01	1	25	61.78
Air 19	315266	635319M	094E02W	15-Dec-01	1	25	61.78
Air 2	315249	635302M	094E02W	15-Dec-01	1	25	61.78
Air 20	315267	635320M	094E02W	15-Dec-01	1	25	61.78
Air 21	315268	635321M	094E02W	15-Dec-01	1	25	61.78
Air 22	315269	635322M	094E02W	15-Dec-01	1	25	61.78
Air 23	315270	635323M	094E02W	15-Dec-01	1	25	61.78
Air 24	315271	635324M	094E02W	15-Dec-01	1	25	61.78
Air 25	315272	635325M	094E02W	15-Dec-01	1	25	61.78
Air 26	315273	635326M	094E02W	15-Dec-01	1	25	61.78
Air 27	315274	635327M	094E02W	15-Dec-01	1	25	61.78
Air 28	315275	635328M	094E02W	15-Dec-01	1	25	61.78

CLAIM	TENURE #	TAG #	MAP NUMBER	STATUS	UNITS	HECTARES	ACRES
Air 3	315250	635303M	094E02W	15-Dec-01	1	25	61.78
Air 4	315251	635304M	094E02W	15-Dec-01	1	25	61.78
Air 5	315252	635305M	094E02W	15-Dec-01	1	25	61.78
Air 6	315253	635306M	094E02W	15-Dec-01	1	25	61.78
Air 7	315254	635307M	094E02W	15-Dec-01	1	25	61.78
Air 8	315255	635308M	094E02W	15-Dec-01	1	25	61.78
Air 9	315256	635309M	094E02W	15-Dec-01	1	25	61.78
Alison 1	243440	204491	094E02E	15-Dec-02	20	500	1235.52
Alison 2	243441	204472	094E02E	15-Dec-02	20	500	1235.52
Atty 1	343143	232741	094E02W	15-Dec-01	20	500	1235.52
Atty 2	343144	232742	094E02W	15-Dec-01	20	500	1235.52
Atty 3	343145	232743	094E02W	15-Dec-01	20	500	1235.52
Atty 4	343146	232744	094E02W	15-Dec-01	20	500	1235.52
Atty 5	343147	232745	094E02W	15-Dec-01	15	375	926.64
Atty 6	343148	232746	094E02W	15-Dec-01	15	375	926.64
Atty 7	343149	232747	094E02W	15-Dec-01	20	500	1235.52
Atty 8	343150	232748	094E02W	15-Dec-01	20	500	1235.52
Can 1	243063	220263	094E02W	15-Dec-01	20	500	1235.52
Chika 1	243074	220274	094D15E	15-Dec-01	20	500	1235.52
Chika 2	243075	220275	094D15E	15-Dec-01	8	200	494.21
Creek	243067	220267	094E02E	15-Dec-01	12	300	741.31
D.C. 1	304015	635270M	094E02W	15-Dec-02	1	25	61.78
D.C. 2	304016	635271M	094E02W	15-Dec-02	1	25	61.78
D.C. 3	304017	635272M	094E02W	15-Dec-02	1	25	61.78
D.C. 4	304018	635273M	094E02W	15-Dec-02	1	25	61.78
D.C. 5	304019	635274M	094E02W	15-Dec-02	1	25	61.78
Dam 1	355413	665857M	094D15E	15-Dec-01	1	25	61.78
Dam 2	355414	665858M	094D15E	15-Dec-01	1	25	61.78
Dam 3	355415	665859M	094E02E	15-Dec-01	1	25	61.78
Dam 4	355416	665860M	094E02E	15-Dec-01	1	25	61.78
Du	238819	97170	094E02E	15-Dec-02	20	500	1235.52
Du 2	242573	210087	094E02E	15-Dec-02	20	500	1235.52
Due 5	242579	612759M	094E02W	15-Dec-01	1	25	61.78
Due 6	242580	612760M	094E02W	15-Dec-01	1	25	61.78
Dun 1	310076	223627	094E02E	15-Dec-01	9	225	555.99
Dun 2	310077	223628	094E02E	15-Dec-01	9	225	555.99
Dun 3	310078	223629	094E02E	15-Dec-01	9	225	555.99
Dunc 1	243064	220264	094E02E	15-Dec-01	4	100	247.10
Dunc 2	243065	220265	094E02E	15-Dec-01	4	100	247.10
Dunc 3	243066	220266	094E02E	15-Dec-01	6	150	370.66
Fork 1	355409	665893M	094E02E	15-Dec-01	1	25	61.78
Fork 2	355410	665897M	094E02E	15-Dec-01	1	25	61.78
Fork 3	355411	665898M	094E02E	15-Dec-01	1	25	61.78
Fork 4	355412	665899M	094E02E	15-Dec-01	1	25	61.78
Fred	243070	220270	094E02E	15-Dec-01	6	150	370.66
Freddy 1	304008	635261M	094E02E	15-Dec-02	1	25	61.78
Freddy 2	304009	635262M	094E02E	15-Dec-02	1	25	61.78
Freddy 3	304010	635263M	094E02E	15-Dec-02	1	25	61.78
Freddy 4	304011	635264M	094E02E	15-Dec-02	1	25	61.78
Freddy 5	304012	635265M	094E02E	15-Dec-02	1	25	61.78

CLAIM	TENURE #	TAG #	MAP NUMBER	STATUS	UNITS	HECTARES	ACRES
Freddy 6	304013	635266M	094E02E	15-Dec-02	1	25	61.78
Freddy 7	304014	635267M	094E02E	15-Dec-02	1	25	61.78
Gold 1	305548	634705M	094E02E	15-Dec-00	1	25	61.78
Gold 2	305549	634706M	094E02E	15-Dec-00	1	25	61.78
Gold 3	305550	634707M	094E02E	15-Dec-00	1	25	61.78
Gold 4	305551	634708M	094E02E	15-Dec-00	1	25	61.78
Gold 5	305552	634709M	094E02E	15-Dec-00	1	25	61.78
Gold 6	305553	634710M	094E02E	15-Dec-00	1	25	61.78
Gold 7	305554	634711M	094E02E	15-Dec-00	1	25	61.78
Gold 8	305555	634712M	094E02E	15-Dec-00	1	25	61.78
Goz 1	304706	634702M	094E02E	15-Dec-02	1	25	61.78
Goz 2	304707	634703M	094E02E	15-Dec-02	1	25	61.78
Hena 10	311294	634568M	094E02E	15-Dec-01	1	25	61.78
Hena 33	311261	634575M	094E02E	15-Dec-01	1	25	61.78
Hena 34	311262	634576M	094E02E	15-Dec-01	1	25	61.78
Hena 35	311263	634577M	094E02E	15-Dec-01	1	25	61.78
Hena 36	311264	634578M	094E02E	15-Dec-01	1	25	61.78
Hena 37	311265	634579M	094E02E	15-Dec-01	1	25	61.78
Hena 38	311266	634586M	094E02E	15-Dec-01	1	25	61.78
Hena 39	311267	648194M	094E02E	15-Dec-01	1	25	61.78
Hena 40	311268	648195M	094E02E	15-Dec-01	1	25	61.78
Hena 7	311291	633946M	094E02E	15-Dec-01	1	25	61.78
Hena 8	311292	633940M	094E02E	15-Dec-01	1	25	61.78
Hena 9	311293	634567M	094E02E	15-Dec-01	1	25	61.78
KC 1	309045	224244	094E02E	15-Dec-01	20	500	1235.52
KC 10	309054	635258M	094D15E	15-Dec-01	1	25	61.78
KC 11	309055	635259M	094D15E	15-Dec-01	1	25	61.78
KC 12	309056	635275M	094D15E	15-Dec-01	1	25	61.78
KC 13	309057	635276M	094D15E	15-Dec-01	1	25	61.78
KC 14	310032	635253M	094D15E	15-Dec-01	1	25	61.78
KC 15	310033	635252M	094D15E	15-Dec-01	1	25	61.78
KC 16	310034	635250M	094D15E	15-Dec-01	1	25	61.78
KC 17	310035	635249M	094D15E	15-Dec-01	1	25	61.78
KC 18	310036	635251M	094D15E	15-Dec-01	1	25	61.78
KC 19	310037	635248M	094D15E	15-Dec-01	1	25	61.78
KC 2	309046	634584M	094E02E	15-Dec-01	1	25	61.78
KC 3	309047	634585M	094E02E	15-Dec-01	1	25	61.78
KC 4	309048	634587M	094E02E	15-Dec-01	1	25	61.78
KC 5	309049	634588M	094D15E	15-Dec-01	1	25	61.78
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KC 7	309051	634590M	094D15E	15-Dec-01	1	25	61.78
KC 8	309052	635268M	094D15E	15-Dec-01	1	25	61.78
KC 9	309053	635269M	094D15E	15-Dec-01	1	25	61.78
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LA 3	243356	607770M	094E02W	15-Dec-01	1	25	61.78
LA 4	243357	607771M	094E02W	15-Dec-01	1	25	61.78
LA 5	243358	607772M	094E02W	15-Dec-01	1	25	61.78
LA 6	243359	607773M	094E02W	15-Dec-01	1	25	61.78
LA 7	243360	607774M	094E02W	15-Dec-01	1	25	61.78

CLAIM	TENURE #	TAG #	MAP NUMBER	STATUS	UNITS	HECTARES	ACRES
LA 8	243361	607775M	094E02W	15-Dec-01	1	25	61.78
Lake 1	243362	224438	094E02W	15-Dec-01	20	500	1235.52
Lake 2	243363	224439	094E02W	15-Dec-01	20	500	1235.52
Mill Creek 1	355405	677457M	094E02E	15-Dec-01	1	25	61.78
Mill Creek 2	355406	677458M	094E02E	15-Dec-01	1	25	61.78
Mill Creek 3	355407	677459M	094E02E	15-Dec-01	1	25	61.78
Mill Creek 4	355408	677460M	094E02E	15-Dec-01	1	25	61.78
Nek 1	241957	120209	094E02W	15-Dec-02	12	300	741.31
Nek 2	241958	120210	094E02E	15-Dec-02	10	250	617.76
Nek 3	241959	120226	094E02E	15-Dec-02	20	500	1235.52
Nek 4	242574	210086	094E02W	15-Dec-02	14	350	864.87
New Kemess No. 1	237800	9355	094E02W	15-Dec-02	18	450	1111.97
New Kemess No. 2	237801	9356	094E02W	15-Dec-02	20	500	1235.52
New Kemess No. 3	241960	120227	094E02E	15-Dec-02	15	375	926.64
Nor 10	303614	117180	094D15W	15-Dec-01	8	200	494.21
Nor 11	303615	117181	094D15W	15-Dec-01	4	100	247.10
Nor 12	303616	117179	094E02W	15-Dec-01	3	75	185.33
Nor 15	305630	210202	094D15W	15-Dec-01	8	200	494.21
Nor 2	239096	104647	094E02W	15-Dec-03	10	250	617.76
Nor 3	239097	104639	094E02W	15-Dec-03	9	225	555.99
Nor 4	239098	104636	094D15W	15-Dec-03	18	450	1111.97
Nor 5	242991	219880	094D15E	15-Dec-01	16	400	988.42
Nor 6	242992	219881	094D15E	15-Dec-01	16	400	988.42
Nor 7	350859	232604	094D15W	15-Dec-04	18	450	1111.97
Nor 8	301219	209384	094D15W	15-Dec-03	6	150	370.66
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Pond 2	243077	607766M	094E02E	15-Dec-02	1	25	61.78
Pond 3	243078	607767M	094E02E	15-Dec-02	1	25	61.78
Pond 4	243079	607768M	094E02E	15-Dec-02	1	25	61.78
Rat 1	239994	108063	094E02W	15-Dec-02	9	225	555.99
Rat 2	243165	220305	094E02W	15-Dec-02	10	250	617.76
Rat 3	243166	220306	094E02W	15-Dec-02	20	500	1235.52
Rated	243069	220269	094E02E	15-Dec-01	20	500	1235.52
Ridge 1	364550	233896	094E02W	15-Dec-00	18	450	1111.97
Ridge 2	364551	233897	094E02W	15-Dec-00	18	450	1111.97
Ridge 3	364552	233898	094E02W	15-Dec-00	18	450	1111.97
Rik	243071	220271	094D15E	15-Dec-01	20	500	1235.52
Ron 10	350860	232605	094E02W	15-Dec-04	20	500	1235.52
Ron 11	238706	89109	094E02W	15-Dec-02	10	250	617.76
Sem #1	241014	109800	094E02E	15-Dec-02	16	400	988.42
Ser	243068	220268	094E02E	15-Dec-01	20	500	1235.52
Son 1	243072	220272	094D15E	15-Dec-01	20	500	1235.52
Son 2	243073	220273	094D15E	15-Dec-01	10	250	617.76
SR 1	304020	635280M	094E02E	15-Dec-02	1	25	61.78
SR 2	304021	635279M	094E02E	15-Dec-02	1	25	61.78
SR 3	304022	635278M	094E02E	15-Dec-02	1	25	61.78
SR 4	304023	635277M	094E02E	15-Dec-02	1	25	61.78
SR 5	310075	223626	094E02E	15-Dec-01	8	200	494.21
SR 6	310054	633948M	094E02E	15-Dec-01	1	25	61.78
SR 7	310055	633941M	094E02E	15-Dec-01	1	25	61.78

CLAIM	TENURE #	TAG #	MAP NUMBER	STATUS	UNITS	HECTARES	ACRES
SR 8	310056	633944M	094E02E	15-Dec-01	1	25	61.78
Tiszi 1	243442	224443	094E02E	15-Dec-02	20	500	1235.52
Tiszi 2	243443	224444	094E02E	15-Dec-02	20	500	1235.52
Waste 1 Fr.	325176	223652	094E02W	15-Dec-02	1	25	61.78
Mining Lease	354991		094E02E	9-Sep-01	0	0	0.00

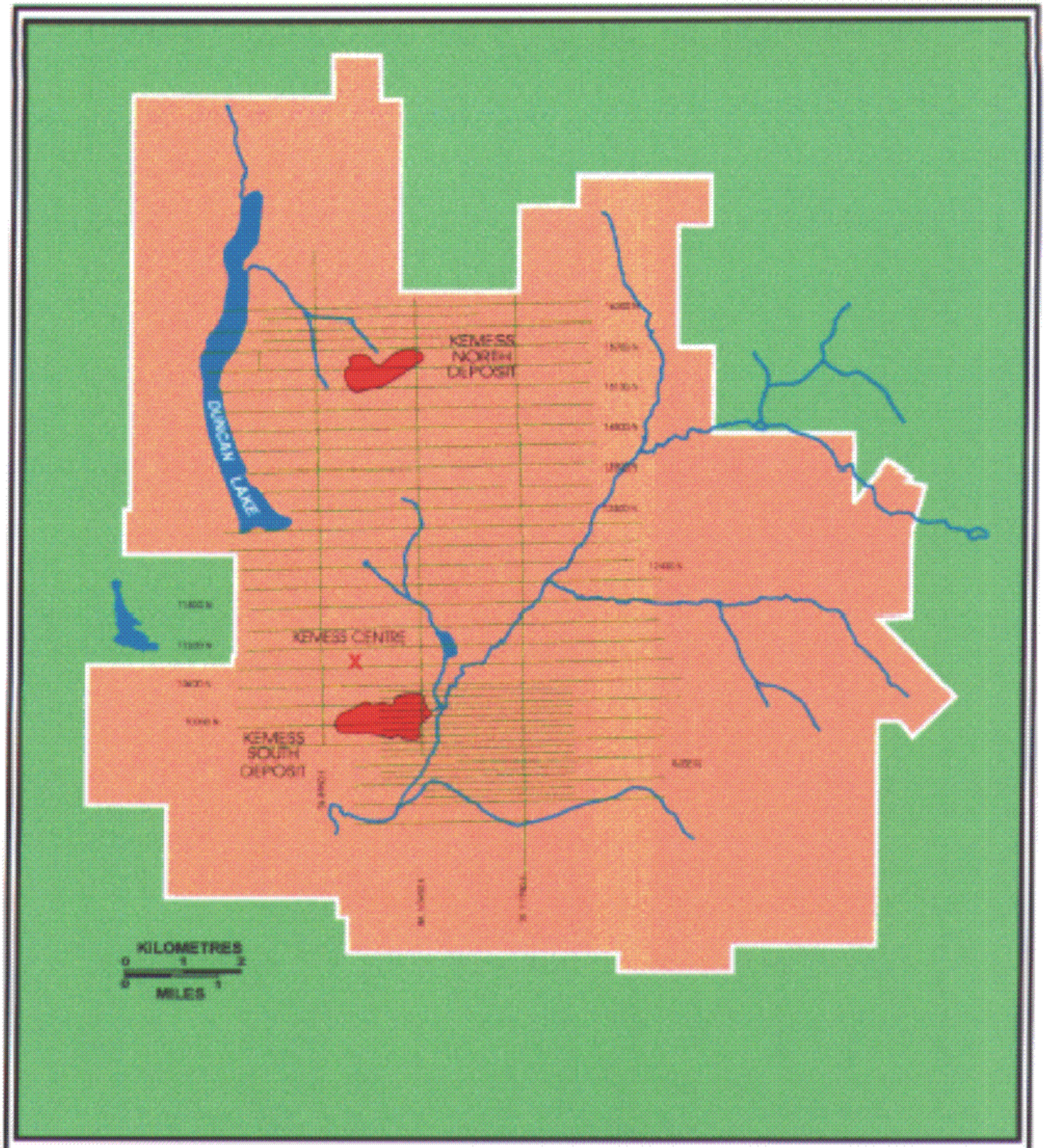


FIGURE 2:
NORTHGATE EXPLORATION LTD..
KEMESS PROPERTY
GENERALIZED CLAIM BOUNDARIES AND PROPERTY GRID

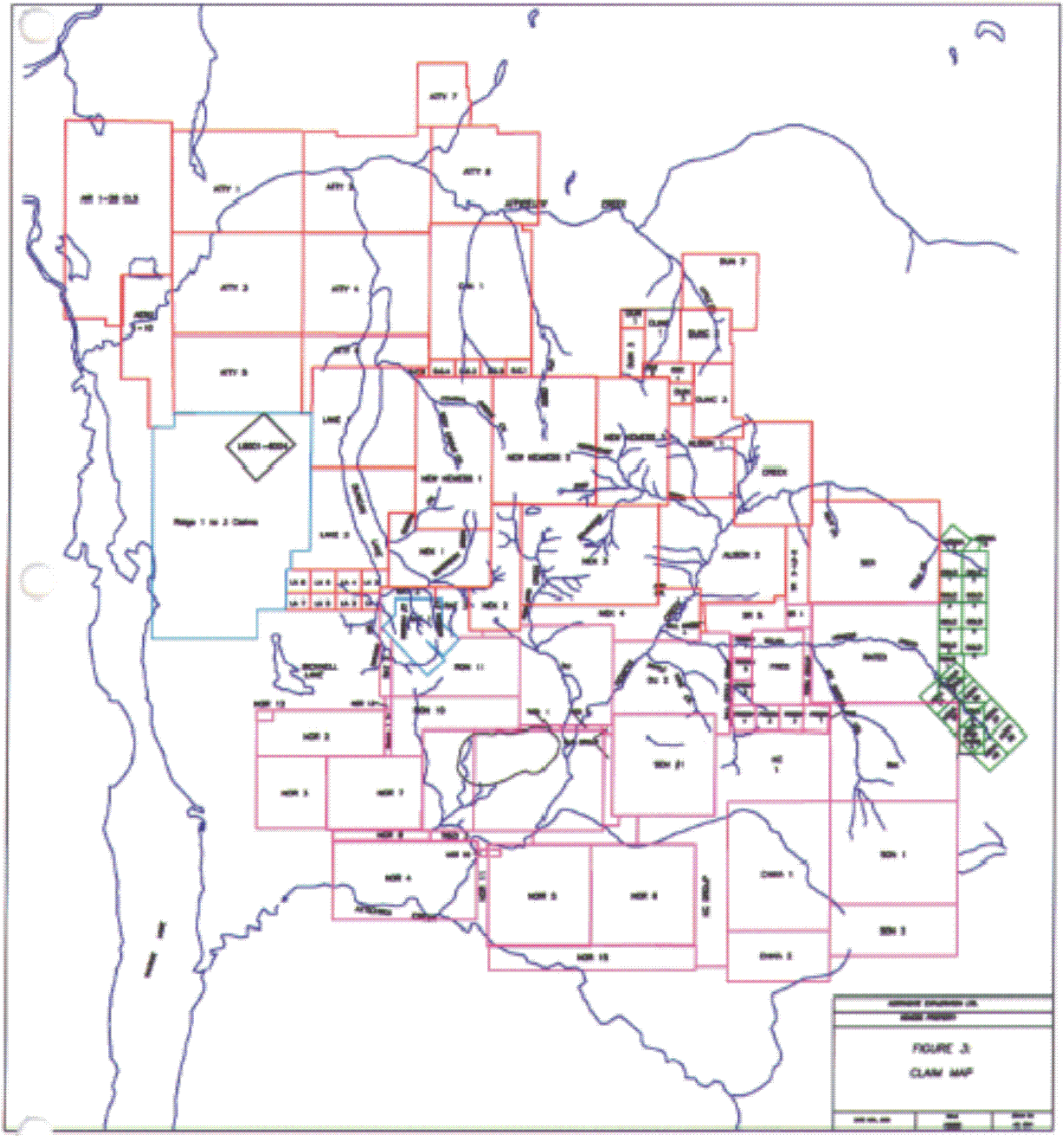


FIGURE 3:
CLAIM MAP

5.0 DISTRICT EXPLORATION AND MINING HISTORY

The exploration history surrounding the Kemess property dates back to the turn of the century with the discovery of placer gold, in 1889, at the mouth of McConnell Creek. The discovery of McConnell Creek, located approximately 30 kilometres north of Johanson Lake, led to a brief gold rush in 1907. Prospecting continued in the Toodoggone District early in the 1920's and resulted in the discovery of placer gold at McClair Creek. Cominco Ltd. discovered and staked lead-zinc mineralization in a skarn showing in the Toodoggone District, including the Cairn showing at Duncan Ridge, in 1931, but no significant lode gold deposits were discovered until much later.

Exploration activity in the late 1960's led to the discovery of the Chapelle epithermal gold-silver vein deposit. This deposit, located approximately 20 kilometres south of the Kemess South Mine, was discovered in 1968 by Kennco Explorations (Western) Ltd. while searching for porphyry copper-molybdenum deposits in the Toodoggone District. The discovery prompted several major mining companies to explore the region for precious and base metal occurrences. The work of these companies over the next fifteen years, following the Chapelle discovery, resulted in the discovery of several epithermal gold and silver prospects, as well as the Kemess North porphyry gold-copper deposit.

Development of many of the district's epithermal gold and silver prospects has occurred over the last fifteen years. Dupont of Canada operated the Baker (Chapelle) Mine, which had initial reserves of 91,000 tonnes grading 28 gAu/t and 560 gAg/t. It was during this period that Dupont constructed the Sturdee Valley airstrip to service the mine.

Cheni Gold Mines Inc. operated the epithermal-type Lawyers, Cliff and Al vein deposits, located approximately 44 kilometres north of the Kemess property, from 1988 to 1992. At the start of production, Cheni's reserves were reported to be 1.28 million tonnes grading 6.72 gAu/t and 243 gAg/t. Cheni extended the Omineca Resource Access Road in 1988, with the assistance of the provincial government, in order to facilitate mine development and operations.

In 1983, Pacific Ridge Resources Corp., and successor El Condor Resource Corp., began exploration work in the south Toodoggone area, including the Duncan ridge area. A strong focus on porphyry exploration culminated in the discovery of the Kemess South porphyry copper-gold deposit, which was brought into commercial production in 1998. Published reserves in 1999 are listed as 165 million tonnes grading 0.231 % Cu and 0.661 gAu/t containing approximately 3.5 million ounces of gold and 840 million pounds for a mine life of 9.4 years.

6.0 REGIONAL GEOLOGY

The Toodoggone District is underlain by a 90 km long by 15 km wide northwest-trending belt of Paleozoic to Tertiary sediments, volcanics and intrusives (Figure 4). The Sustut Group (Upper Cretaceous to Tertiary) sediments, which form the western margin of the Toodoggone belt, unconformably overlie the Toodoggone Formation volcanics (Hazelton Group, Lower Jurassic). East of the Sustut Group, occurring as fault blocks within Toodoggone volcanics, Takla Group (Upper Triassic) volcanics form a disrupted belt of faulted segments containing lesser fault blocks of Asitka (mid-Pennsylvanian to Lower Permian) volcanics and sediments, including limestone. Granitic plutons of the Omineca-related Black Lake intrusive suite (Lower Jurassic) intrude both Takla and Permian stratigraphy.

7.0 STRUCTURAL SETTING

The geological framework of the Toodoggone District is a result of co-magmatic intrusive-volcanic hydrothermal processes occurring along deep-seated north trending structural breaks during a 20 million-year period from Upper Triassic to Lower Jurassic time. These structural breaks controlled volcanism. Thick successions of Toodoggone volcanic rocks were extruded in a subaerial, perhaps partially shallow marine environment, over a basement of older Takla and Asitka volcano-sedimentary rocks. Intrusive and hydrothermal systems associated with volcanism invaded these rocks along the same deep-seated, and periodically reactivated, north-trending structural breaks. Stocks, dykes and sills of the Black Lake suite of intrusions were thereby emplaced in Toodoggone volcanics and the basement Takla-Asitka rocks. Linear zones of varied kinds and intensity of hydrothermal alteration, veining and mineralization associated with emplacement of plutons were also injected at different structural levels in Toodoggone and older rocks. Subsequently, the Toodoggone and earlier rocks were subjected to repeated and extensive normal block faulting from Jurassic to Tertiary time. Within these fault blocks, Toodoggone rocks display broad open folds, commonly with dips of less than 25°. Sustut Group sedimentary rocks unconformably overlie these earlier rocks and have a relatively low dip angle with few major structural disruptions.

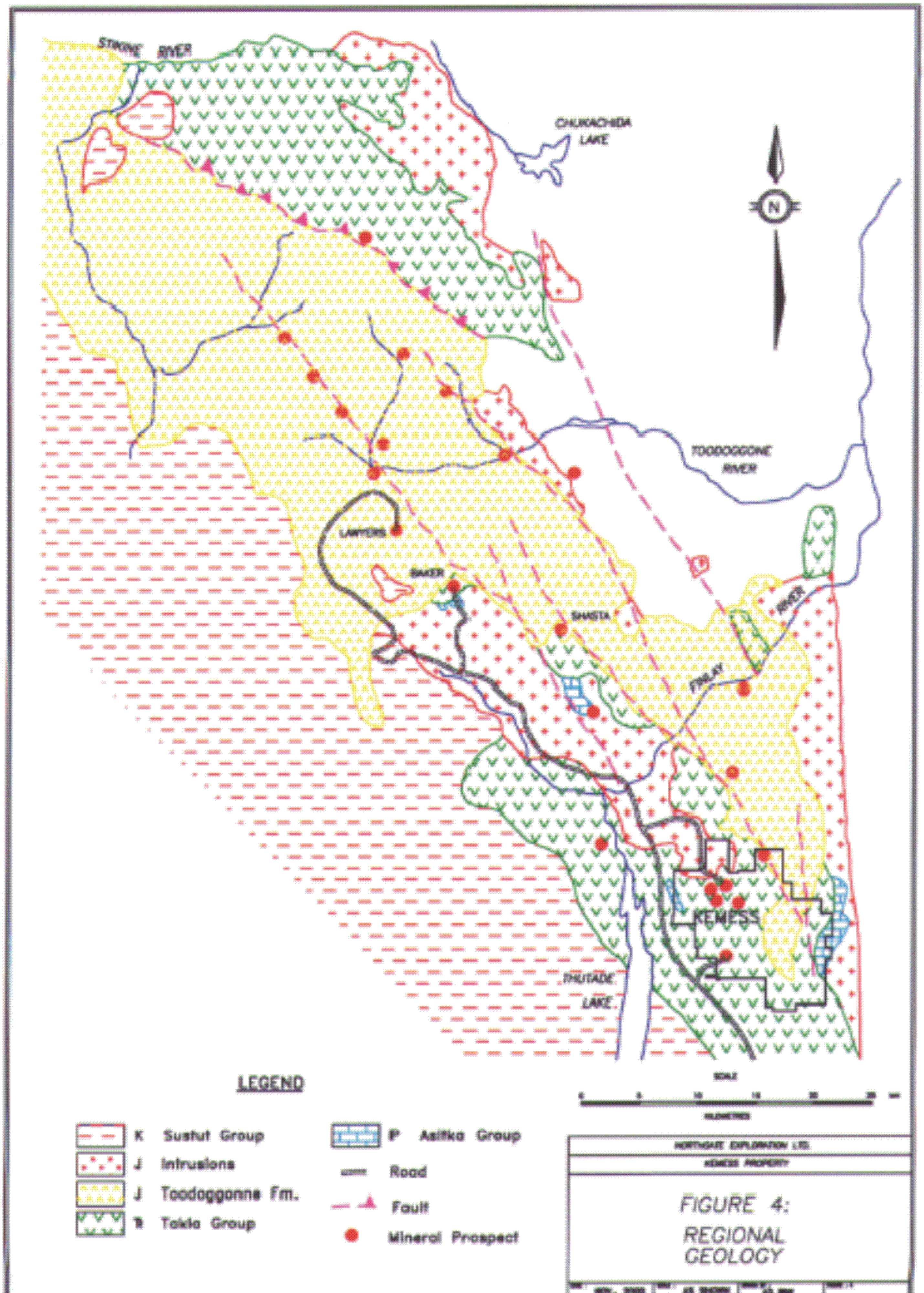


FIGURE 4:
REGIONAL GEOLOGY

8.0 STRATIGRAPHY

8.1 ASITKA GROUP (MID-PENNSYLVANIAN TO LOWER PERMIAN)

Asitka Group rocks are the oldest known in the Toodoggone District and are thought of as basement stratigraphy in the area. The Asitka Group is subdivided into two units, the lower Volcanic Unit and Upper Sedimentary Unit. The Asitka Group is unconformably overlain by Upper Triassic Takla Group, and intruded by the Early Jurassic calc-alkaline intrusions of the Black Lake suite.

The Lower Volcanic Unit of the Asitka Group is the thicker of the two units regionally, and grades from rhyolitic tuffs at the base, through porphyritic andesite, to massive basalt at the top. The Upper Sedimentary Unit of the Asitka Group consists regionally of flat to gently dipping, massive and recrystallized limestone, with local interbeds of chert or graphitic to siliceous mudstone.

8.2 TAKLA GROUP (UPPER TRIASSIC)

The Takla Group unconformably overlies the Asitka Group rocks, which are in turn unconformably overlain by the Toodoggone Formation rocks of the Lower Jurassic Hazelton Group, and intruded by the Early Jurassic calc-alkaline intrusions of the Black Lake suite. The Takla Group is sub-divided into the Lower Sedimentary Unit and the Upper Volcanic Unit.

The Lower Sedimentary Unit consists of pyritic mudstone overlain by volcanic sandstone. The friable mudstone is brown in colour, gossanous and fossiliferous. The volcanic sandstone grades from light green sandy beds at the base to dark green silty beds with local cross-laminations at the top. The Upper Volcanic Unit consists of black to dark green, massive, highly magnetic augite phyric basalt.

8.3 HAZELTON GROUP (LOWER JURASSIC)

The youngest stratigraphy exposed in the area correlates with the Toddoggone Formation of the Lower Jurassic Hazelton Group. No known exposures of the Toodoggone Formation occur within the claim group of the Kemess project.

8.4 BLACK LAKE INTRUSIVES (EARLY JURASSIC)

The Black Lake Intrusive suite consists of a series of Early Jurassic calc-alkalic intrusions of various sizes, shapes and compositions that intrude rocks of the Asitka and Takla Groups. The field relationships amongst different bodies of the Black Lake intrusions and the Toodoggone Formation have not been seen in outcrop due to the recessive nature of the intrusions and contacts, likely probably due to intense alteration, both contact metamorphic and hydrothermal. Diakow et al. suggest that they are all genetically related to the early Jurassic Hazelton island arc subduction zone.

9.0 PROPERTY GEOLOGY

Takla Group rocks underlie much of the Kemess property area and are composed of porphyritic pyroxene basalt and andesite, polylithic breccias and feldspathic crystal tuff, and a unit comprised mostly of cherty siltstone (Figure 5). A cluster of mainly felsic porphyritic stocks, sills and dykes intrude these rocks. Several large hydrothermal alteration zones that host porphyry-type gold-copper mineralization, as well as a number of skarn and vein-type mineral occurrences, are spatially and possibly genetically related to some of these intrusions.

9.1 KEMESS SOUTH MINE

The Kemess South Mine, which does not crop out, is hosted by the relatively flat-lying quartz monzodiorite Maple Leaf intrusion, which has been traced by diamond drilling for 1,700 metres east-west and 650 metres north-south (Figure 6). The intrusion is relatively fine-grained and porphyritic. Its modal proportions are 5-15% quartz, 40-65% plagioclase and 5-10% potassium feldspar. Mafic minerals are scarce. The intrusion is divisible into two phases based on magnetite content and Th/U ratios. The lower phase has a substantially lower magnetic susceptibility and lower Th/U ratios, but is otherwise similar in appearance and composition to the upper unit. Takla Group volcanic rocks underlie the Maple Leaf intrusion and form a heterogeneous series of intercalated flows, flow breccias, lapilli tuffs and crystal tuffs of andesitic composition, with a minor debris flow/lahar component. Takla Group sedimentary rocks have only been identified north of the North Block Fault in the mine area, where they consist mainly of impure chert. The stratigraphic position of this sedimentary sequence, relative to the Takla Group volcanic rocks underlying the intrusion, is unknown. Prior to, possibly synchronous with, the onset of Sustut Group sedimentation, an autochthonous sedimentary "lag horizon" formed on the surface of the subaerially exposed Maple Leaf intrusion. This unit is composed of weathered fragments of the underlying intrusive rock, and formed under arid weathering conditions without significant transport of the fragments. The horizon is discontinuous and ranges from 1 to 5 m in thickness.

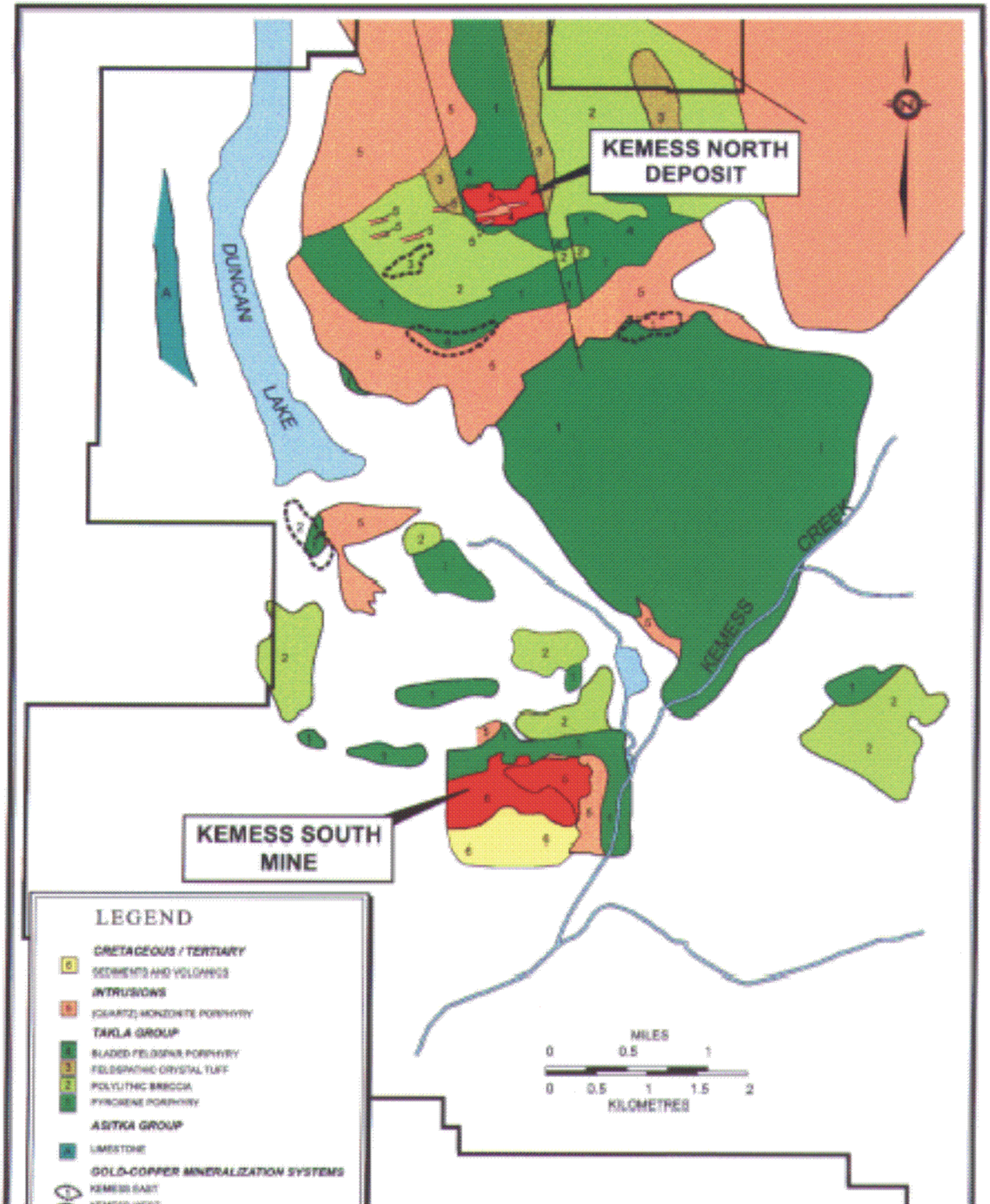


FIGURE 5:

KEMESS PROPERTY GEOLOGY

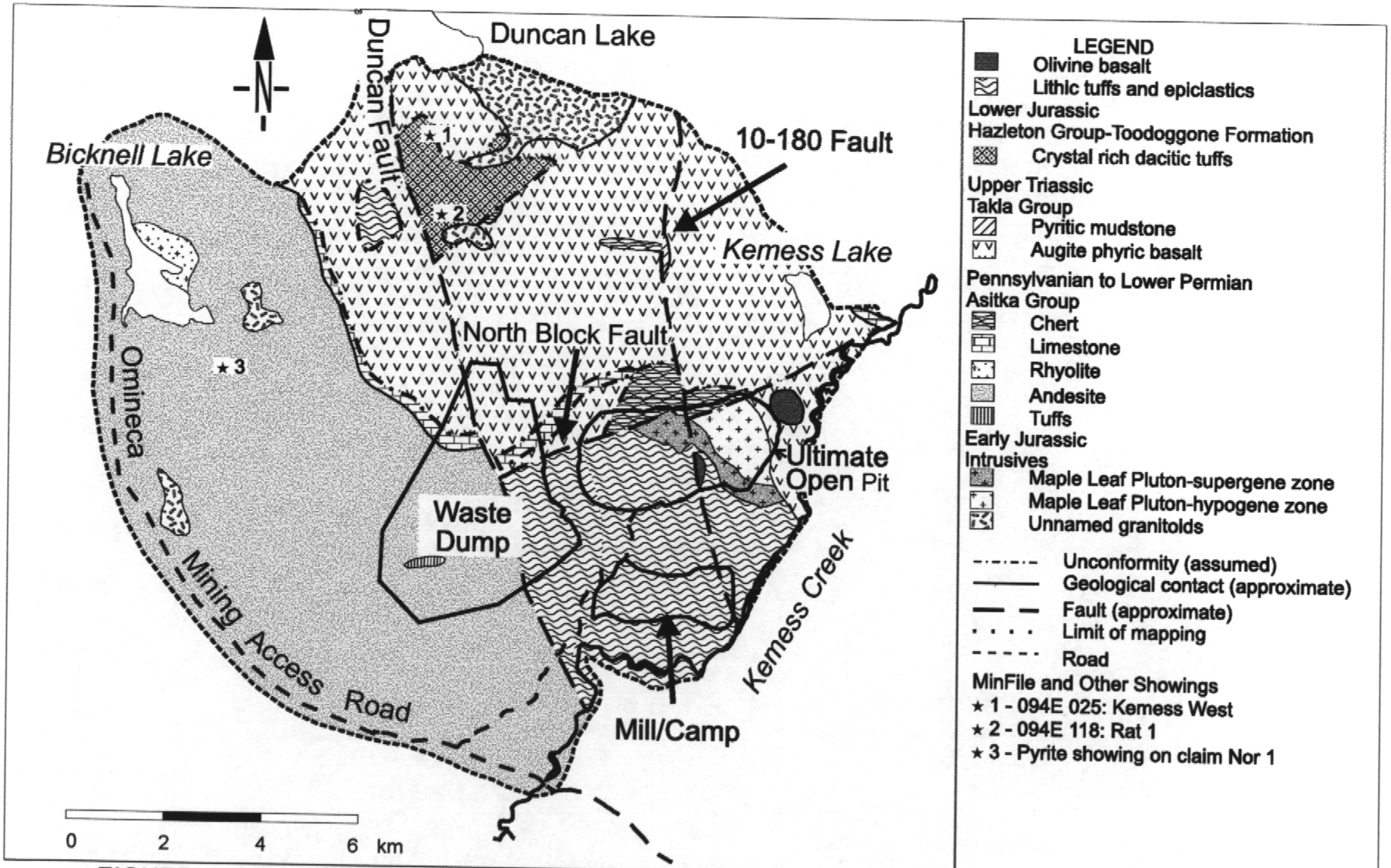


FIGURE 6: GEOLOGY OF THE KEMESS SOUTH MINE

A southwest thickening wedge of Sustut Group rocks unconformably overlies the western half of the Maple Leaf intrusion. Sedimentary rocks consist mainly of a maroon to dark purple-grey, pebble to cobble conglomerate with interbeds of arkosic sandstone, siltstone, greywacke and fine-grained arkosic mudstone. Thin, laterally discontinuous mafic volcanic flows, and a coarse-grained arkose, are intercalated with the sedimentary rocks. Near the base of the unit, fragments of hematized (supergene) quartz monzodiorite containing secondary copper minerals are sometimes present.

An important high angle fault, the North Block Fault, trends at 075° and dips 65°-70° to the south. The gouge zone is between 5 and 15 metres wide and is usually filled with granular, sericitic clay-rich gouge. Parasitic, subparallel shears are common up to 30 to 40 metres on either side of the fault. The fault juxtaposes the mineralized Maple Leaf intrusion and the underlying Takla Group volcanic strata on the south side against weakly pyritic and propylitic Takla Group sedimentary rocks to the north. The sense and magnitude of displacement across the North Block Fault has not been determined due to a lack of reliable marker horizons.

A widespread quartz vein stockwork is developed within the Maple Leaf intrusion. Veins comprise on average between 5-10% of the total rock volume, but over tens of metres can locally comprise more than 40% of the rock. Several generations of vein stockworks are evident. Their intensities are highest in areas of elevated gold-copper values and they tend to diminish toward the basal sections of the intrusion. Intense vein stockwork development within the volcanic country rocks is rare.

While the gold and copper grades throughout the deposit are generally continuous, there is a decrease in grade and gold:copper ratios toward the base of the intrusion that approximates the transition form the upper to lower phase of the quartz monzodiorite.

Regional metamorphism of the supracrustal rocks in the area is of subgreenschist or zeolite faces. However, over large areas of the Kemess property hydrothermal metasomatism appears to have overprinted the effects of the low-grade metamorphism. Adjacent to the intrusions, thermal metamorphism and recrystallization has taken place.

Sulphide content is 1-3% in the core of the intrusive, rising to 5-10% in the peripheral propylitically altered halo at the eastern end of the intrusion. Narrow lead-zinc-silver veins and arsenopyrite-gold veins occur roughly 2 km to the north and northeast of the deposit.

Hypogene mineralization, in order of decreasing abundance, consists of pyrite, chalcopyrite, magnetite-hematite, bornite, molybdenite and traces of pyrrhotite, tetrahedrite and native gold. Pyrite occurs mainly as veins or fracture coatings accompanying quartz stringers. The habit of chalcopyrite is distinctive in that it occurs predominately as totally separate, discrete grains or small anhedral clumps in the silicate matrix of the groundmass and in quartz stockwork veins. Chalcopyrite grains are physically separate from, and are only rarely associated with, pyrite or iron oxides. Magnetite, which is variably altered to martite or intergrown with hematite, has an average concentration of roughly 1% to 1.5%. Unaltered magnetite only occurs toward the base of the intrusion, mostly in the lower phase. Bornite is present in trace amounts in the hypogene zone. It appears in intimate association with chalcopyrite as fine-grained exsolution and rim textures, and as irregular intergrowths. Molybdenum is present in low concentrations. The molybdenite occurs as small, equant, accicular flakes, either as interstitial disseminations in the silicate groundmass or more commonly as disseminated grains in quartz stockwork veins. Gold grades always correlate closely to those of copper in the hypogene zone.

There is a supergene zone developed in the upper portion of the deposit, and small pods of exotic copper mineralization are present within the Sustut Group sedimentary rocks at the deposit's northwestern periphery.

Five main types of alteration have been identified within the Kemess South deposit area. They can be broadly categorized as follows:

- potassium silicate alteration
- sericitization
- silicification
- hematite-carbonate-clay-silica alteration
- propylitization

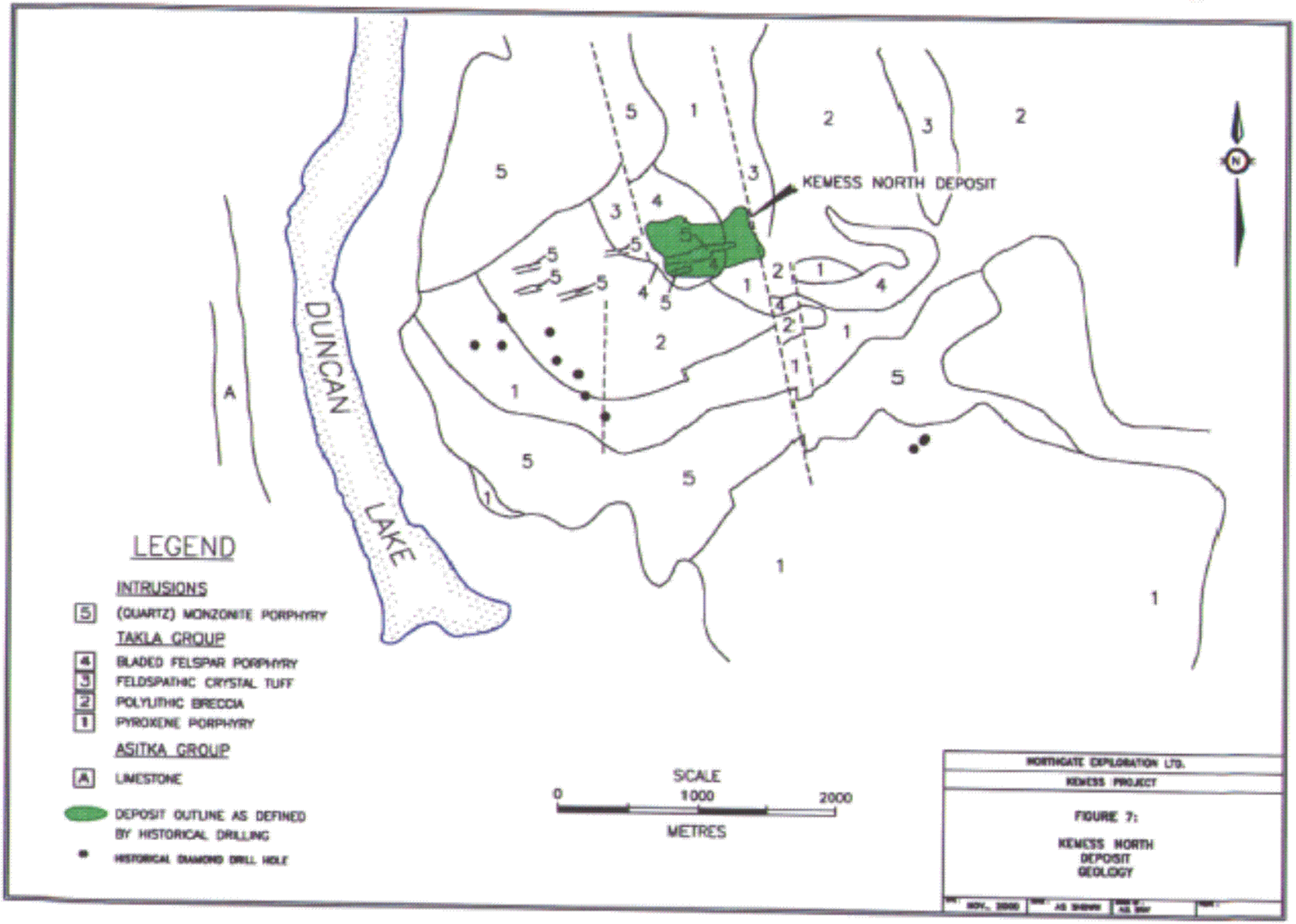
Within the intrusion, the highest gold and copper grades correlate with zones of intense quartz stockwork development accompanied by potassium feldspar alteration selvages.

9.2 KEMESS NORTH DEPOSIT

The Kemess North deposit, located roughly ten kilometres north of the Kemess South Mine, is underlain mainly by Takla Group volcanic rocks that have been intruded by porphyritic monzodiorite dykes, probably of Lower Jurassic age (Figure 7). Porphyry-style copper, gold and minor molybdenum mineralization is centred on the dykes and mainly in Takla Group rocks. A mineralized resource has been calculated for the Kemess North deposit of approximately 74 million drill-indicated tonnes at 0.188% Cu and 0.343 gAu/t.

A bladed feldspar porphyry unit, exposed in cirque headwalls, is characterized by plagioclase lath phenocrysts up to 1.5 cm long set in a fine grained, dark green groundmass. The phenocrysts, occurring as crystal aggregates, comprise 15% to 20% of the rock and are generally randomly oriented. The unit may represent a subvolcanic intrusion and in part, an extrusive dome. Brecciation of the dome has resulted in the formation of coarse proximal breccias that contain individual clasts of bladed feldspar porphyry up to 3 metres in diameter. In the deposit area, the bladed feldspar porphyry unit structurally overlies the Takla Group volcanic rocks.

The monzodiorite dykes are characterized by small subhedral phenocrysts of plagioclase, which comprise between 40-50% of the rock. Less than 10% subrounded quartz grains are present. Dyke contacts are frequently marked by breccia zones, characterized by xenolithic volcanic fragments supported by a matrix of dyke material. These dykes


KEMESS NORTH DEPOSIT
DUNCAN LAKE
A
1
2
3
4
5
N
LEGEND
INTRUSIONS
5 (QUARTZ) MONZONITE PORPHYRY
TAKLA GROUP
4 BLADED FELSPAR PORPHYRY
3 FELDSPATHIC CRYSTAL TUFF
2 POLYLITHIC BRECCIA
1 PYROXENE PORPHYRY
ASITKA GROUP
A LIMESTONE
DEPOSIT OUTLINE AS DEFINED BY HISTORICAL DRILLING
HISTORICAL DIAMOND DRILL HOLE
SCALE
0
1000
2000
METRES
NORTHGATE EXPLORATION LTD.
KEMESS PROJECT
FIGURE 7:
KEMESS NORTH
DEPOSIT
GEOLOGY

appear to be offshoots of the much larger Sovereign pluton, of a similar composition, which is located about one kilometre to the south of the Kemess North deposit.

Postulated dykes, including feldspar porphyritic syenite and minor mafic varieties, outcrop locally. The mafic dykes are thought to be of Cretaceous age and related to the volcanic strata interbedded within Sustut Group sedimentary rocks.

A flat-lying zone of intensely broken rock and multiple gouge zones are collectively referred to as the "Broken Zone". This zone underlies the Kemess North deposit and extends from surface down to an average depth of about 80 metres. The base of the Broken Zone is irregular and undulating and core recoveries average about 50% throughout the zone. Immediately below the base of the Broken Zone the rock is very competent and recoveries improve to the 90-100% range. The post-mineral porphyritic syenite dykes remain solid and competent within the Broken Zone.

The cause of the Broken Zone is uncertain. It has been suggested that it may be the end product of weathering processes during which the dissolution of gypsum and/or hydration of anhydrite has resulted in extensive rock fracturing. The presence of multiple gouge zones, and a subhorizontal shear fabric, however, suggests a deformational aspect to the zone as well.

The common alteration assemblage in the Broken Zone is moderate to strong pervasive chlorite with locally moderate intense pervasive clay, particularly in and around the gouge zones, and with sericite in the groundmass. Quartz veining, locally vuggy, is common but their intensity is weak.

Structures below the Broken Zone consist of minor faults and shears, some of which are healed by chalcopyrite and pyrite-bearing quartz, purple anhydrite and rare fluorite gangue. More commonly, however, minor chloritic structures associated with zones of white carbonate and pink zeolite veining crosscut mineralized veins. In the central portion of the Kemess North deposit, a xenolithic contact breccia zone about 20 metres in width has been hydrothermally brecciated and then overprinted with chalcopyrite-rich quartz-anhydrite veining and flooding.

The gold-copper mineralization is an inclined tabular zone that is hosted mainly by Takla Group volcanic rocks and bladed feldspar porphyry. The deposit is centred on a porphyritic monzodiorite dyke swarm which trends at 070° and dips approximately 50° to the southeast. Diamond drilling has partially outlined a 300 metre wide core of higher gold and copper concentrations within a 600 to 800 metre wide mineralized zone. The zone has been traced for 1200 metres along strike and 400 metres down dip. The ultimate strike length, full width and down dip extent of the deposit has not yet been determined.

Sulphide mineralization consists of 2-3% pyrite, with lesser amounts of chalcopyrite and molybdenite. Pyrite occurs as disseminations, fracture fillings, veins up to a few centimetres wide and in quartz-anhydrite-magnetite veins and localized zones of quartz flooding. The mode of occurrence of chalcopyrite is similar except that veinlets are rare and significant disseminations occur mainly in zones of stronger quartz stockwork development. Gold and copper grades variably diminish outward into the hanging wall and footwall. Total sulphide content in the core of the deposit averages 2-3%, rising to 3-5% in the pyrite-rich propylitic altered halo.

Below the Broken Zone, alteration associated with the core of the higher-grade gold-copper mineralization is characterized by pervasive, very fine felted hydrothermal biotite in volcanic and bladed feldspar porphyry host rocks. The biotite is accompanied by a weakly to moderately well developed stockwork of quartz and purple anhydrite veinlets that contain varying amounts of sulphides and magnetite. Potassium feldspar is also present in the biotite zones as fracture envelopes and veinlets, and in local zones of flooding, especially in and adjacent to some porphyritic monzodiorite dykes. Pervasive chlorite overprints the biotite zone in the vicinity of minor shears and faults, which is accompanied by an increase in carbonate and zeolite veining.

An intense 30 metre by 100 metre zone of silica-magnetite flooding is present within the biotite zone. The zone comprises 50-60% silica and 20-30% magnetite, with the remainder consisting of later quartz and anhydrite veins and sulphides (mainly pyrite). This zone is in contact with, and partially overlaps, monzodiorite dykes and is locally banded.

A propylitic zone of chlorite, carbonate, pyrite, pink zeolite and minor epidote envelopes the biotite zone. Chlorite is extensive and the carbonate and zeolite occur as veinlets and stockworks. Epidote is locally present in carbonate veinlets. Fracturing and faulting appear more numerous in footwall rocks, in which the propylitic alteration is more intense.

Assays indicate that copper has been leached from the upper 5 to 30 meters of the Broken Zone. Beneath the partially leached zone, minor supergene covellite and chalcocite coat chalcopyrite and pyrite grains. Digenite has been observed rimming chalcopyrite grains in polished thin sections.

9.3 KEMESS CENTRE

The Kemess Centre prospect, situated approximately 750 metres to the north of the ultimate pit limits of the Kemess South Mine, is extensively covered by glacial till and has little to no outcrop. The interpreted target area is a porphyry Cu-Au and/or skarn occurring as a separate intrusive body, or possibly a faulted off block of the Kemess South Mine. Geological and geochemical evidence for Kemess Centre is provided by a 1992 diamond drill hole which intersected a swarm of chalcopyrite-bearing Jurassic quartz-feldspar porphyry dykes in Takla volcanics that averaged 0.37 gAu/t and 0.03% Cu. Geophysical evidence for the Kemess Centre prospect is provided by ground geophysical surveys which yielded circular magnetic high features flanked by potassic highs, interpreted to represent potassium alteration associated with an intrusive plug, just to the north of the 1992 diamond drill hole.

10.0 2000 KEMESS SOUTH MINE EXPLORATION

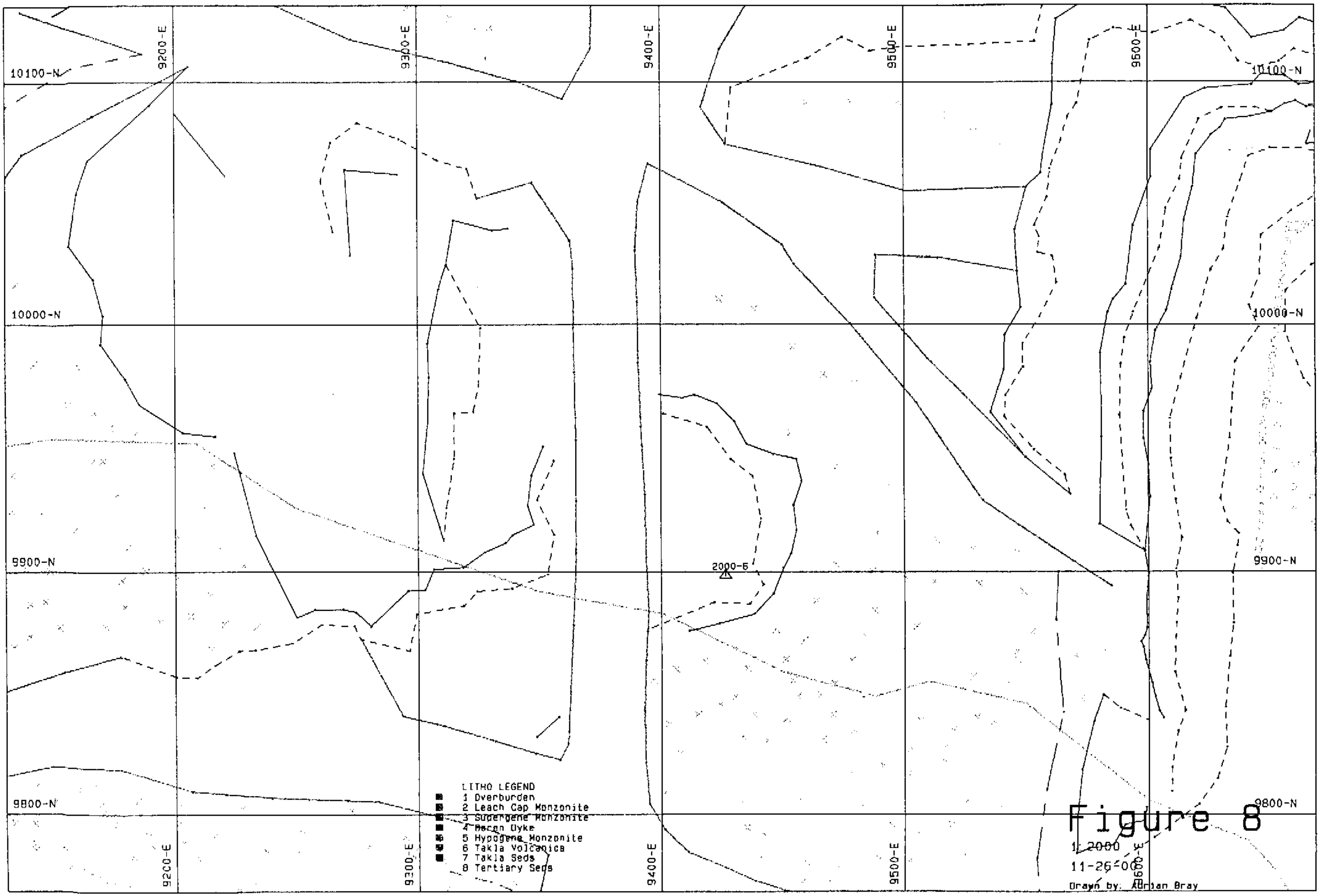
10.1 STRATIGRAPHIC DIAMOND DRILL HOLE 2000-06

One diamond drill hole (2000-06), totaling 314.16 metres, was drilled on the western extremity of the Kemess South Mine open pit (Figure 8). The purpose of this drill hole was to provide a better understanding of the stratigraphy and structure in an area that has received only limited historical drilling. The diamond drill hole log, assay summary, assay certificates and a 1:1,000 section (Figure 11) are located in Appendix 1. Significant assays are shown in Table 2.

The upper 140 metres of the drill hole intersected a thickly bedded polymictic pebble conglomerate. The matrix is clay and hematite rich and the unit contains 25% to 30% 1-70 mm subrounded to subangular fragments. Numerous narrow clay-rich fault gouges and weak shears are scattered throughout the unit. From 140 to 183 metres, the drill hole intersected typical Kemess South Mine supergene quartz monzonite ore. This was followed by a 64.35 metre interval of hypogene quartz monzonite ore. Below the hypogene ore, a 16.95 metre fault zone, the North Boundary Fault, was intersected within the bedded Takla Sediments, at 35 to 40 degrees to the core axis. Below the structure, a 107.11 metre interval of bedded Takla sediments was intersected. The sediments are intruded by intermediate to mafic dykes varying from 1 to 6 metres in thickness.

HOLE_ID	FROM	TO	WIDTH	% Cu	gAu/t
2000-06	128.30	132.30	4.00	0.205	0.070
2000-06	138.30	207.35	69.05	0.288	1.102

Table 2: Significant Assays DDH 2000-06


9200-E
9300-E
9400-E
9500-E
9600-E
10100-N
10000-N
9900-N
9800-N
2000-6
LITHO LEGEND
1 Overburden
2 Leach Cap Monzonite
3 Supergene Monzonite
4 Recen Dyke
5 Hypogene Monzonite
6 Takla Volcanics
7 Takla Seds
8 Tertiary Seds
1:2000
11-26-00
Drawn by: Adrian Bray
Figure 8

11.0 2000 KEMESS NORTH DEPOSIT EXPLORATION

A two-phase, twelve-hole, helicopter assisted diamond drill program totaling 4,104.45 metres was conducted during the period of July to November 2000. Diamond drilling was contracted to Britton Brothers of Smithers, B.C. Assayers Canada analyzed samples for ore grade copper and fire assay gold. The phase one program totaled 2,565.20 metres in nine holes (KN-00-01 to KN-00-09) and was performed from July 26th to August 18th, 2000. Phase two was conducted during the period November 5th to November 27th, 2000 and totaled 1,539.25 metres in three holes (KN-00-10 to KN-00-12). Drill hole collar locations are shown in Figure 9. Table 3 summarizes drill hole locations and orientations.

HOLE ID	NORTHING	EASTING	ELEVATION	AZIMUTH	INCLINATION	DEPTH
KN-00-01	15573.87	9662.98	1751.07	180	-75	131.06
KN-00-02	15960.28	9659.79	1702.54		-90	150.88
KN-00-03	15689.36	9959	1702.15		-90	399.29
KN-00-04	15808.87	10158.77	1720.12		-90	399.29
KN-00-05	15963.83	10162.22	1719.44		-90	399.29
KN-00-06	15641.1	9862.07	1715.1		-90	113.08
KN-00-07	15736.21	10062.73	1694.33	180	-60	129.54
KN-00-08	15897.93	10261.63	1776.9	340	-80	454.15
KN-00-09	16069.31	10126.67	1700.24		-90	388.62
				PHASE 1 SUBTOTAL:		**2565.20**
KN-00-10	15790.36	10225.93	1747.40	360	-80	521.21
KN-00-11	15944.16	10398.41	1733.80	340	-80	509.02
KN-00-12	16018.29	10282.24	1794.38	340	-80	509.02
				PHASE 2 SUBTOTAL:		**1539.25**
				PHASE 1 & 2 TOTAL:		**4104.45**

Table 3: Kemess North Drill Hole Location Summary

Holes were logged geologically as well as geotechnically, using procedures and log forms provided by Knight Piesold Consulting of Vancouver, British Columbia. Due to extremely poor RQD in the upper 60 to 100 metres of bedrock, HQ diameter drill rods were used. Once less fractured rocks were encountered, drill holes were reduced to NQ using the HQ as casing. Sampling was relatively consistent at two metre intervals, but controlled by geology in that samples generally do no cross geological contacts. In addition, sampling widths varied within areas of low to extremely low core recoveries.

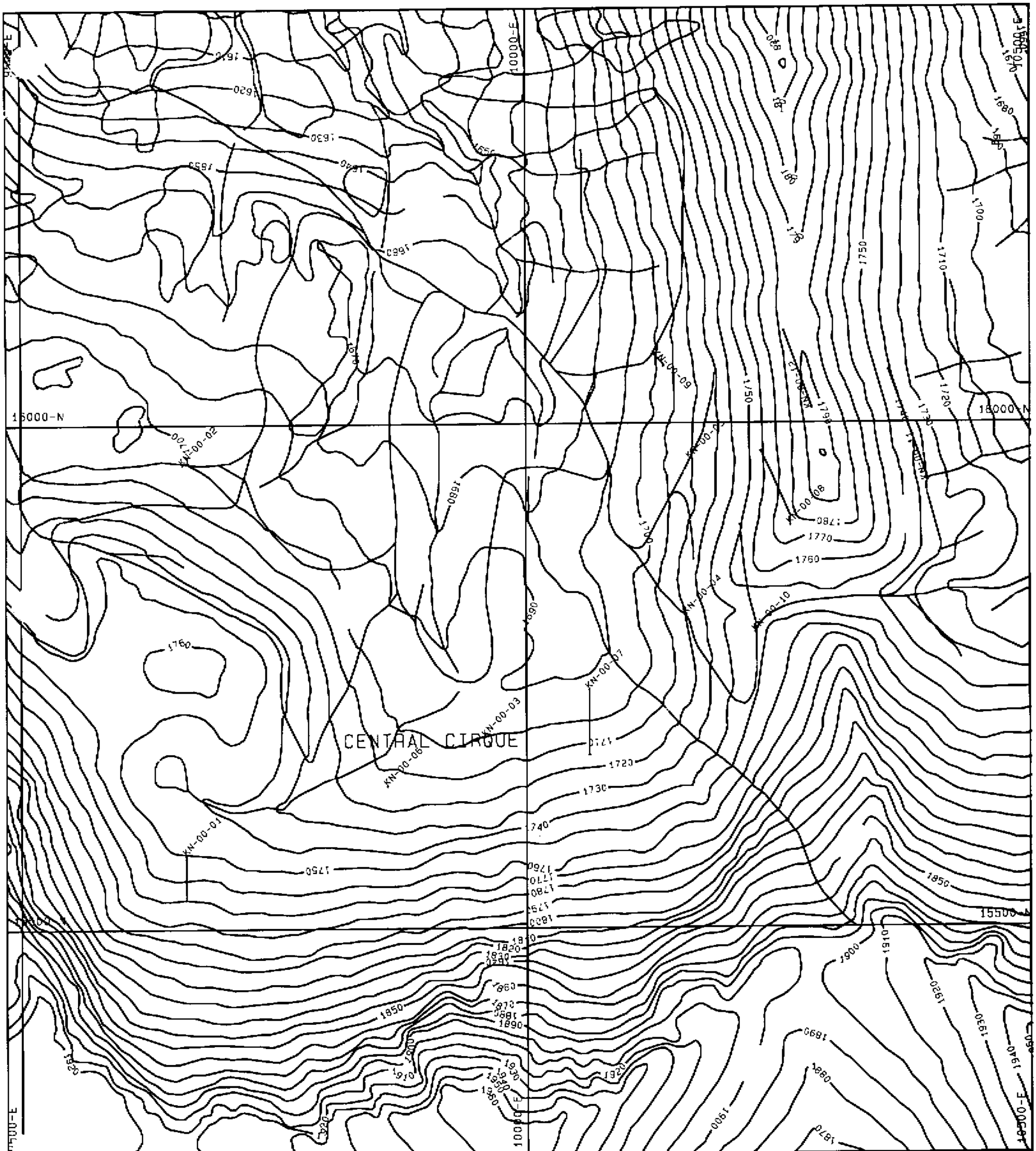


FIGURE 9

DDH COLLARS

KEMESS-NORTH

1:5000

11-24-00

Drill hole logs, assay summaries and certificates and sections at a scale of 1:1,000 (Figures 12 to 18) are located in Appendix 2. Down hole surveying was not performed on drill holes KN-00-01 to KN-00-07, as the proper equipment was not available at the time.

All drill holes were designed to infill significant gaps in the previous drilling to enable a more precise ore resource calculation, to better define and test for higher-grade zones, to attain information for pit wall optimization and to gain intersections at various depths for specific gravity and metallurgical testing.

Lithologies intersected in the drilling included andesites, sub-volcanic feldspar porphyries (bladed feldspar porphyry), quartz monzodiorites and barren post-mineralization monzodioritic and/or syenitic dykes. These lithologies are consistent with the previous drilling by El Condor Resources Ltd. Takla Formation andesitic volcanics and bladed feldspar porphyries are the predominant units in the upper sections of the drill holes. They generally exhibited pervasive chlorite/pyrite propylitic alteration with varying amounts of biotite, sericite and clay. Pyrite in the Talka volcanics varied from 3-10% as disseminations, fracture fill and within quartz, k-feldspar and anhydrite +/- gypsum veins, which average 1% to 3%. Chalcopyrite averages < 1% and occurs as fracture fill, associated with the pyrite in veinlets and as very fine-grained disseminations. The lower intrusive quartz monzodiorite unit is moderately to strongly potassically altered as staining associated with a weak to moderately developed quartz and/or anhydrite/gypsum stockwork veining, as well as to the matrix. These veins generally contain patchy pyrite +/- chalcopyrite. Within the intrusive, pyrite averages 2-3%, magnetite 1% and chalcopyrite < 1%. Later barren post-mineralization monzodioritic dykes crosscut the mineralized quartz monzodiorite.

Significant assays are summarized in Tables 4 (Phase 1) and 5 (Phase 2).

Table 4: Significant Assays Kemess North Deposit Phase 1 Drilling

HOLE_ID	FROM	TO	WIDTH	% Cu	gAu/t
KN-00-01	35.00	37.00	2.00	0.025	2.06
KN-00-01	79.00	81.00	2.00	0.018	1.08
KN-00-01	98.00	100.00	2.00	0.041	1.16
KN-00-01	104.00	106.00	2.00	0.121	0.87
KN-00-01	110.00	112.00	2.00	0.040	1.88
KN-00-01	125.00	128.00	3.00	0.024	1.52
KN-00-02	14.02	30.00	15.98	0.127	0.40
KN-00-02	34.00	41.50	7.50	0.270	0.37
KN-00-02	**42.67**	**150.88**	**108.21**	**0.159**	**0.28**
including	42.67	55.10	12.43	0.206	0.39
including	64.01	79.25	15.24	0.243	0.42
including	88.39	94.00	5.61	0.187	0.37
KN-00-03	144.00	146.00	2.00	0.164	0.31
KN-00-03	180.00	182.00	2.00	0.130	0.17
KN-00-03	186.00	188.00	2.00	0.136	0.27
KN-00-03	251.65	253.62	1.97	0.105	0.26
KN-00-03	265.45	269.38	3.93	0.112	0.16
KN-00-03	275.08	286.85	11.77	0.140	0.14
KN-00-03	294.68	300.42	5.74	0.120	0.22
KN-00-03	316.00	320.00	4.00	0.121	0.17
KN-00-03	330.00	336.00	6.00	0.110	0.14
KN-00-03	386.00	392.00	6.00	0.109	0.19
KN-00-04	46.00	48.00	2.00	0.105	0.33
KN-00-04	76.00	84.10	8.10	0.124	0.30
KN-00-04	90.00	94.49	4.49	1.230	0.11
KN-00-04	142.00	146.00	4.00	0.119	0.19
KN-00-04	148.00	152.00	4.00	0.103	0.13
KN-00-04	**170.00**	**292.61**	**122.61**	**0.158**	**0.27**
including	202.80	204.80	2.00	0.236	0.45
including	224.00	228.00	4.00	0.330	0.33
including	242.00	250.00	8.00	0.300	0.58
including	254.00	256.00	2.00	0.246	0.50
including	260.00	270.00	10.00	0.242	0.41
KN-00-04	**298.70**	**359.00**	**60.30**	**0.152**	**0.26**
including	308.00	310.00	2.00	0.263	0.31
including	325.10	327.40	2.30	0.203	0.22
including	329.00	333.00	4.00	0.224	0.37
including	347.00	349.00	2.00	0.312	0.52
KN-00-04	**298.70**	**399.29**	**100.59**	**0.142**	**0.26**
including	389.00	399.29	10.29	0.211	0.40
including	391.00	393.00	2.00	0.482	0.87
KN-00-05	**20.12**	**399.29**	**379.17**	**0.217**	**0.38**
including	20.12	38.90	18.78	0.293	0.35
including	158.00	204.00	46.00	0.226	0.38
including	182.00	204.00	22.00	0.256	0.41
including	208.00	218.00	10.00	0.302	0.44
including	234.00	244.00	10.00	0.298	0.43
including	252.00	350.00	98.00	0.279	0.41
including	275.40	280.75	5.35	0.494	0.64
including	296.00	314.00	18.00	0.323	0.44
including	322.00	330.00	8.00	0.303	0.50

HOLE_ID	FROM	TO	WIDTH	% Cu	gAu/t
KN-00-05					
including	344.00	350.00	6.00	0.357	0.49
including	364.00	393.00	29.00	0.299	0.61
KN-00-06	77.05	79.15	2.10	0.105	0.33
KN-00-07	20.10	22.00	1.90	0.116	0.29
KN-00-07	40.00	42.00	2.00	0.173	0.27
KN-00-08	**3.05**	**454.15**	**451.10**	**0.177**	**0.33**
including	3.05	17.00	13.95	0.147	0.21
including	26.00	106.00	80.00	0.176	0.38
including	60.00	64.50	4.50	0.252	0.53
including	85.00	89.00	4.00	0.206	0.43
including	138.38	144.00	5.62	0.228	0.41
including	217.00	221.00	4.00	0.202	0.39
including	223.00	227.00	4.00	0.216	0.35
including	237.00	247.00	10.00	0.245	0.38
including	251.00	255.00	4.00	0.220	0.42
including	258.71	261.00	2.29	0.394	0.56
including	290.00	300.00	10.00	0.217	0.39
including	314.00	318.00	4.00	0.247	0.40
including	322.00	328.00	6.00	0.248	0.38
including	332.00	340.00	8.00	0.227	0.34
including	356.50	410.00	53.50	0.260	0.42
including	413.30	419.00	5.70	0.383	0.60
including	435.00	454.15	19.15	0.354	0.58
KN-00-09	**9.14**	**388.62**	**379.48**	**0.194**	**0.33**
including	19.40	27.00	7.60	0.214	0.47
including	*152.00*	*160.00*	*8.00*	*0.249*	*0.40*
including	166.00	170.00	4.00	0.276	0.45
including	174.00	186.00	12.00	0.258	0.43
including	*196.00*	*200.00*	*4.00*	*0.254*	*0.48*
including	213.47	218.00	4.53	0.209	0.31
including	236.00	244.00	8.00	0.215	0.34
including	*256.00*	*269.20*	*13.20*	*0.298*	*0.48*
including	277.70	284.00	6.30	0.246	0.36
including	310.00	313.10	3.10	0.215	0.31
including	*319.00*	*349.00*	*30.00*	*0.268*	*0.38*
including	357.00	388.62	31.62	0.317	0.48

Table 4 (cont.): Significant Assays Kemess North Deposit Phase 1 Drilling

HOLE_ID	FROM	TO	WIDTH	% Cu	gAu/t
KN-00-10	77.00	81.00	4.00	0.129	0.31
KN-00-10	114.00	124.00	10.00	0.153	0.27
KN-00-10	134.00	138.00	4.00	0.135	0.21
KN-00-10	156.00	160.00	4.00	0.120	0.28
KN-00-10	189.00	195.00	6.00	0.143	0.34
KN-00-10	199.00	203.00	4.00	0.160	0.24
KN-00-10	211.00	259.00	48.00	0.165	0.29
KN-00-10	263.00	277.00	14.00	0.161	0.32
KN-00-10	293.00	297.00	4.00	0.134	0.22
KN-00-10	303.00	368.00	65.00	0.204	0.31
KN-00-10	376.00	408.00	32.00	0.166	0.34
KN-00-10	478.00	518.00	40.00	0.158	0.33
KN-00-11	21.34	25.20	3.86	0.141	0.39
KN-00-11	42.67	44.20	1.53	0.123	0.21
KN-00-11	56.00	60.00	4.00	0.139	0.35
KN-00-11	67.44	69.70	2.26	0.192	0.42
KN-00-11	92.24	99.60	7.36	0.159	0.25
KN-00-11	103.15	456.22	353.07	0.191	0.26
including	301.00	371.00	70.00	0.243	0.32
including	381.00	456.22	75.22	0.264	0.29
KN-00-11	474.22	494.50	20.28	0.311	0.39
KN-00-12	26.00	509.02	483.02	0.217	0.40
including	89.00	97.00	8.00	0.399	0.90
including	175.00	179.00	4.00	0.236	0.46
including	213.00	227.00	14.00	0.229	0.38
including	237.00	239.00	2.00	0.681	0.96
including	263.00	364.00	101.00	0.290	0.39
including	406.00	468.00	62.00	0.295	0.58
including	484.00	509.02	25.02	0.450	0.80

Table 5: Significant Assays Kemess North Deposit Phase 2 Drilling

12.0 2000 KEMESS CENTRE EXPLORATION

12.1 GEOPHYSICAL SURVEYS

Delta Geoscience Ltd. conducted a 6.50 line kilometer magnetic, radiometric, induced polarization and resistivity geophysical program from September 25th to October 3rd, 2000. The geophysical program is discussed in a separate attached report.

12.2 DIAMOND DRILLING

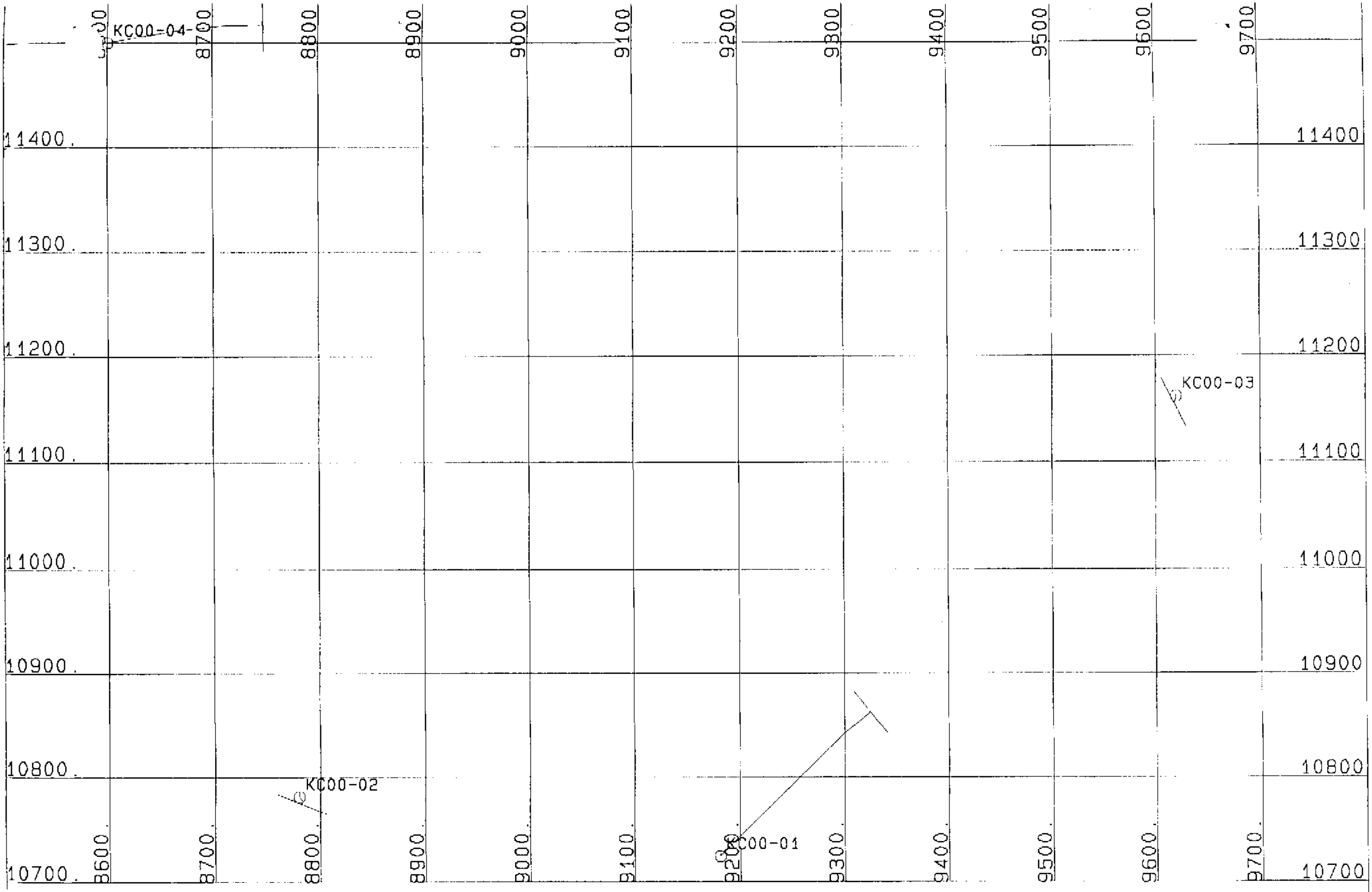
A four-hole (KC-00-01 to KC-00-04) diamond drill program totaling 1,015 metres was conducted during the period of June 13th to July 19th, 2000. A D10R was used to establish access to the Kemess Centre prospect. Diamond drilling was contracted to Britton Brothers of Smithers, B.C. ASL Chemex assayed samples for copper (nitric aqua regia) and fire assay gold, with every fifth sampling being analyzed for 32-element ICP. *Drill hole collar locations are illustrated in Figure 10 and summarized in Table 6. Drill* hole logs, assay summaries and certificates, and sections (Figures 19 to 22), at a scale of 1:1,000, are located in Appendix 3.

HOLE ID	NORTHING	EASTING	ELEVATION	AZIMUTH	INCLINATION	TOTAL DEPTH
KC-00-01	10724.24	9181.18	1418.28	45	-47	300.84
KC-00-02	10781.51	8779.98	1413.15		-90	219.15
KC-00-03	11161.143	9619.957	1503.84		-90	175.87
KC-00-04	11500	8600	1430	78	-65	319.14
					TOTAL	**1015**

Table 6: Kemess Centre Drill Hole Location Summary

<u>KC-00-01:</u> This hole was targeted to test an east-west orientated potassium/uranium anomaly approximately 1,600 metres in length and 300 to 500 metres in width, centered on the Kemess Mine grid at 9,000 east along line 10,900 north, as well as to test the south flank of an extensive magnetic high.

KC-00-01 was drilled to a depth of 300.84 metres. The upper 114 metres intersected intermediate to mafic volcanic flows and intercalated tuffs. A fault zone within the volcanics occurs at 99.65 to 111.54 metres. One barren dioritic dyke was intersected at



Kemess Centre 2000
Exploration Drill Hole Plan

11-23-00

1:5000.M

Figure 10

32.35 to 49.25 metres. The mafic volcanics are dark green and weakly, but pervasively, chloritic altered. Magnetite is disseminated throughout the unit and averages 2-4%.

Traces of disseminated pyrite are noted. The diorite dyke exhibits weak patchy potassic alteration and contains rare traces of disseminated pyrite. The fault zone encompasses six separate fault gouges, ranging form 0.10 to 0.45 metres in width, and is dipping at high angles to the core axis.

From 114 metres to the bottom of the hole, a highly siliceous bedded to massive siltstone occurs, which is locally cross cut by mafic dykes. Bedding is locally at 40° to 50° to the core axis, with beds ranging from <1 cm to 20 cm in width. Wispy biotite was occasionally noted within the beds. Sulphide mineralization within the siltstone averages <2% pyrite with traces of chalcopyrite associated with minor quartz +/- carbonate veinlets.

The magnetite within the upper mafic volcanic unit would explain the moderate magnetic high, while the biotite within the lower siliceous siltstone unit would explain the potassic anomaly. Quartz +/- carbonate veining with traces of chalcopyrite mineralization, as well as potassic alteration (biotite) may indicate a proximal intrusive body and fluid source. Assays for KC-00-01 are shown in Table 7.

Hole_ID	From	To	Width	Cu_ppm	Au_ppb	Ag_ppm
KC-00-01	30.90	32.35	1.45	25	2.5	0.1
KC-00-01	32.35	34.45	2.10	27	2.5	0.1
KC-00-01	34.45	36.20	1.75	15	2.5	0.1
KC-00-01	36.20	38.10	1.90	27	2.5	0.1
KC-00-01	38.10	40.00	1.90	24	2.5	0.1
KC-00-01	40.00	41.75	1.75	31	10	0.1
KC-00-01	41.75	43.50	1.75	16	2.5	0.1
KC-00-01	43.50	45.00	1.50	20	2.5	0.1
KC-00-01	45.00	46.75	1.75	31	2.5	0.1
KC-00-01	46.75	49.25	2.50	14	2.5	0.1
KC-00-01	88.80	89.90	1.10	21	5	0.1
KC-00-01	89.90	91.30	1.40	207	15	0.2
KC-00-01	95.90	98.00	2.10	37	2.5	0.1
KC-00-01	106.90	109.10	2.20	65	45	0.1
KC-00-01	109.10	110.80	1.70	79	60	0.1
KC-00-01	126.90	127.70	0.80	67	20	0.1
KC-00-01	127.70	129.90	2.20	412	2.5	0.2
KC-00-01	157.00	158.25	1.25	96	10	0.1
KC-00-01	158.25	159.45	1.20	17	2.5	0.1
KC-00-01	184.15	185.55	1.40	26	5	0.1
KC-00-01	223.90	225.15	1.25	57	2.5	0.1
KC-00-01	255.05	256.10	1.05	209	2.5	0.2
KC-00-01	256.10	257.45	1.35	95	2.5	0.1
KC-00-01	257.45	259.10	1.65	145	2.5	0.2

Table 7: Assay Results for KC-00-01

KC-00-02: This hole was designed to target the western extension of an east-west oriented potassium and uranium anomaly approximately 1,600 metres in length and 300 to 500 metres in width, located on Kemess Mine grid on line 10,900 North. Delta Geoscience Ltd. postulated in their November 1999 geophysical report (internal company report) that this anomaly may represent a faulted off section of the quartz monzonite intrusive body which hosts the Kemess South Mine. The hole was also designed to test the south end of a moderate north-south trending IP resistivity low and the northwest flank of a high to moderate IP chargeability anomaly, as defined by Lloyd Geophysics Ltd. in 1999.

KC-00-02 was drilled to a depth of 219.15 metres. The upper portion of the hole, to 76.60 metres, intersected weak clay, sericite and potassically altered quartz monzonite containing 2-4% magnetite, and <1% disseminated pyrite and traces of chalcopyrite A narrow mafic dyke cross cuts the unit between 71.25 to 73.05 metres. From 76.60 to 128.72 metres, the hole intersected a siliceous biotite siltstone unit, as in KC-00-01, which is cross cut by a number of narrow quartz monzonite, andesite and mafic dykes. The siltstone unit averages 1-3% pyrite as fine irregular fracture fill and associated with thin quartz +/- carbonate stringers. Traces of chalcopyrite are also noted within this unit. Underlying the siltstone, from 128.72 to 159 metres, the drill hole intersected another quartz monzonite, identical to the upper quartz monzonite. This unit is in turn underlain by the siliceous biotite siltstone unit from 159 to 186.45 metres, intermediate volcanics from 186.45 to 205.50 meters and from 205.50 to 210.20 metres, the siliceous biotite siltstone.

The potassium anomaly is explained by both the weak potassium alteration within the quartz monzodiorite, as well as by the biotite within the siliceous siltstone. The presence of weak, but pervasive sericite and clay alteration, in addition to >1% pyrite occurring within most of the lithologies, would explain the moderate IP resistivity low. Quartz +/- carbonate veining with traces of chalcopyrite mineralization, as well as potassic alteration (biotite), may indicate a proximal intrusive body and fluid source. A summary of anomalous assays for KC-00-02 is shown in Table 8.

HOLE_ID	FROM	TO	WIDTH	Cu_ppm	Au_ppb	Ag_ppm	Comment
KC-00-02	4.57	10.57	6.00	323	6.7	0.4	anomalous Cu
KC-00-02	71.25	75.10	3.85	328	2.5	0.1	anomalous Cu
KC-00-02	91.50	97.00	5.50	224	5.4	0.2	anomalous Cu
KC-00-02	110.25	111.10	0.85	300	45.0	0.1	highest Au value
KC-00-02	115.80	119.05	3.25	320	11.8	0.5	anomalous Cu
KC-00-02	126.95	128.70	1.75	1120	30.0	0.8	highest Cu value
KC-00-02	137.00	144.35	7.35	307	4.8	0.1	anomalous Cu
KC-00-02	152.75	154.60	1.85	601	5.0	4.4	highest Ag value
KC-00-02	152.75	162.55	9.80	364	10.9	1.0	anomalous Cu
KC-00-02	190.50	193.10	2.60	470	2.5	0.2	anomalous Cu
KC-00-02	202.60	203.85	1.25	872	20.0	0.2	anomalous Cu

Table 8: Summary of Anomalous Assays for KC-00-02

KC-00-03: This hole was designed to test a potassium anomaly, as well as a trailing IP chargeability high, to the northeast of KC-00-01 and KC-00-02. This chargeability high is similar to the near-surface chargeability anomaly located on line 9,900 north at 10,500 east that occurs at the contact between supergene and hypogene ore types at the Kemess South Mine.

KC-00-003 was drilled to a depth of 175.87 metres. From surface to a depth of 37.70 metres, the hole intersected fine-grained clay and sericite altered pyroclastics: lapilli and ash tuffs with local quartz/carbonate. The unit contains 2% pyrite and traces of chalcopyrite associated with patchy silicification and quartz/carbonate veining. The unit is highly fractured and oxidized to a depth of 16 metres.

Below this volcanic horizon, two apophyses of quartz monzonite occur between 37.70 to 56.24 metres and 69.00 to 83.32 metres, within a thick sequence of interbedded siltstones and massive mafic flows, which occur to the end of the hole. The apophyses are moderately clay altered with weakly developed patchy k-feldspar alteration, and contain 1% pyrite and traces of chalcopyrite.

The presence of pyrite and clay within the upper fine-grained pyroclastics, coupled with the well-developed oxidation, may explain the cause of the IP chargeability high. Weak to well developed patchy k-feldspar alteration within the monzonite apophyses may explain the potassium anomaly. The clay and k-feldspar altered monzonite aphophyses with traces of chalcopyrite may indicate a proximal intrusive body and fluid source. A summary of anomalous assays for KC-00-02 is shown in Table 9.

HOLE_ID	FROM	TO	WIDTH	Cu_ppm	Au_ppb	Ag_ppm	Comment
KC-00-03	4.70	19.75	15.05	253	39.5	0.4	anomalous Au & Cu
KC-00-03	8.23	13.55	5.32	231	53.0	0.4	anomalous Cu & Au
KC-00-03	17.15	19.75	2.60	686	380.0	1.0	highest Cu value
KC-00-03	102.50	103.75	1.25	60	2.5	1.6	highest Ag value
KC-00-03	156.45	158.00	1.55	198	430.0	0.1	highest Au value

Table 9: Summary of Anomalous Assays for KC-00-03

KC-00-04: This hole was designed to test the center of a bulls eye potassium high, a proximal thorium high and a very well defined chargeability high anomaly within a large chargeability low background.

The hole was drilled to a depth of 319.14 metres and intersected patchy moderate k-feldspar and chlorite altered quartz monzonite throughout its entire length. The k-feldspar alteration occurs as selvages to the quartz veining, along fractures and to the matrix. A weakly developed quartz and Fe-carbonate stockwork occurs throughout. Pyrite is ubiquitous, averaging 1-3%, and occurs as fine disseminations as well as within quartz veining. The upper 200 metres of the hole contains trace to <1% chalcopyrite as very fine-grained disseminations, as well as within the quartz veins.

The bulls-eye potassium high and chargeability high are explained by the k-spar alteration and disseminated pyrite, respectively. A summary of anomalous assays for KC-00-02 is shown in Table 9.

HOLE_ID	FROM	TO	WIDTH	Cu_ppm	Au_ppb	Ag_ppm	Comment
KC-00-04	29.10	34.30	5.20	308	13.2	0.2	anomalous Cu
KC-00-04	58.15	60.05	1.90	516	45.0	0.8	anomalous Cu & Au
KC-00-04	85.00	119.45	34.45	1144	57.4	1.0	**0.114% Cu**
KC-00-04	100.90	102.70	1.80	2470	170.0	2.6	highest Au value
KC-00-04	108.80	110.30	1.50	3040	95.0	2.2	highest Ag value
KC-00-04	136.25	139.30	3.05	460	2.5	0.2	anomalous Cu
KC-00-04	143.70	145.40	1.70	2560	10.0	5.6	highest Ag value
KC-00-04	143.70	152.50	8.80	1321	5.2	1.9	**0.132% Cu**
KC-00-04	171.25	179.65	8.40	361	4.4	0.2	anomalous Cu
KC-00-04	181.97	194.16	12.19	341	6.1	0.4	anomalous Cu
KC-00-04	197.21	201.70	4.49	310	2.5	0.1	anomalous Cu

Table 10: Significant Assay Summary for KC-00-04

13.0 CONCLUSIONS AND RECOMMENDATIONS

The year 2000 diamond drilling exploration program, together with previous exploration results, has outlined a geological resources at the Kemess North deposit of 360 million tonnes grading 0.154 % Cu and 0.299 gAut. The deposit has been outlined over a strike length of 1,200 metres in length, 500 metres in width and extending over 500 metres at depth. The ultimate strike length, width and downdip extent of the deposit has not yet been delineated.

A systematic grid-based 5,000 diamond drill program on 100 metre centers is recommended in order to test the strike and depth extension of the newly discovered porphyry system in the Kemess North deposit. If the deposit were found to extend beyond the proposed grid-based program, additional drilling would be warranted. An induced polarization and magnetic geophysical program is recommended in order to evaluate the mineralization potential at northeast edge of the Kemess North deposit.

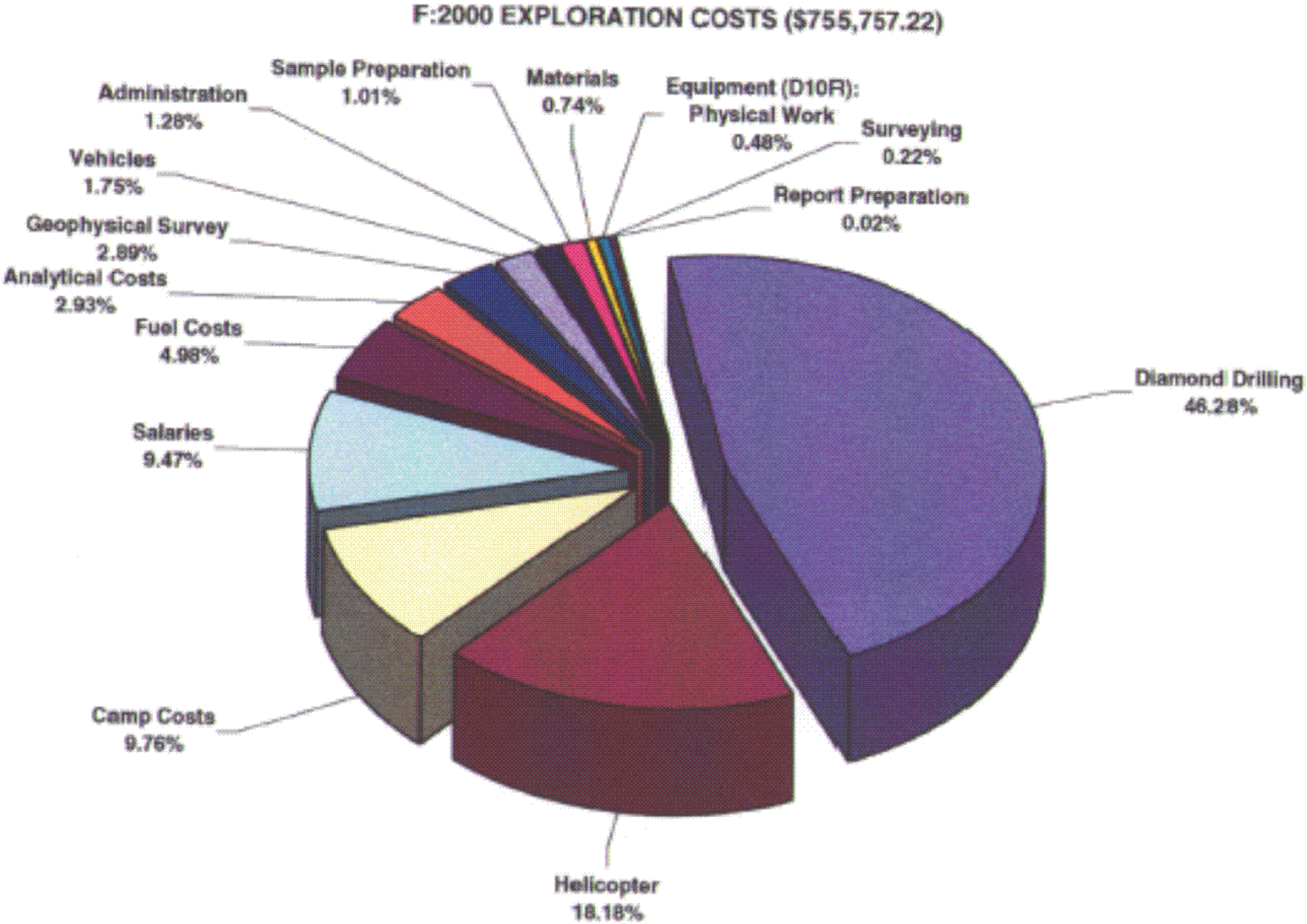
Diamond drilling program at Kemess Centre project intersected lithologies, alteration and mineralization, which may be indicative of a proximal intrusive body and fluid source. However, the four-hole drilling program did not intersect significant mineralization. One additional drill hole is recommended to test an induced polarization anomaly defined by a previous geophysical program.

14.0 STATEMENT OF COSTS

Exploration costs for the period of May 1st to December 7th, 2000 totaled $755,757.22 as outlined in Table 11 below, and in pie chart format on the following page. Detailed cost accounting by category is provided in Appendix 4.

Category	Total Costs	% Of Total
Diamond Drilling	349763.20	46.28
Helicopter	137395.35	18.18
Camp Costs	73755.00	9.76
Salaries	71568.50	9.47
Fuel Costs	37663.70	4.98
Analytical Costs	22164.79	2.93
Geophysical Survey	21864.65	2.89
Vehicles	13260.00	1.75
Administration	9666.64	1.28
Sample Preparation	7617.33	1.01
Materials	5623.57	0.74
Equipment (D10R): Physical Work	3618.00	0.48
Surveying	1650.00	0.22
Report Preparation	146.49	0.02
TOTAL	**755757.22**	**100.00**

Table 11: Exploration Costs by Category


F:2000 EXPLORATION COSTS ($755,757.22)
Sample Preparation 1.01%
Materials 0.74%
Equipment (D10R): Physical Work 0.48%
Administration 1.28%
Surveying 0.22%
Vehicles 1.75%
Report Preparation 0.02%
Geophysical Survey 2.89%
Analytical Costs 2.93%
Fuel Costs 4.98%
Diamond Drilling 46.28%
Salaries 9.47%
Camp Costs 9.76%
Helicopter 18.18%

15.0 STATEMENT OF QUALIFICATIONS

I, Adrian D. Bray, of 4285 Sophia St. Unit #14 of Vancouver British Columbia, do hereby certify that:

1. I have studied Geology at Acadia University in Wolfville, Nova Scotia and have received a Bachelor of Sciences degree with Honours in Geology and a Major in German in October of 1986.

2. I am an Associate Member in good standing with the Geological Association of Canada.

3. I have continuously practiced by profession since graduation in Nova Scotia, Ontario, Quebec, British Columbia, Cuba and Mexico.

4. I co-supervised the 2000 exploration program on the Kemess Property and have reviewed all of the data.

Dated at Kemess South Mine, Omineca Mining Division, the 15th day of January, 2001

Adrian D. Bray

STATEMENT OF QUALIFICATIONS

I, Brett R. LaPeare, of 3866 Comox St. of Smithers British Columbia, do hereby certify that:

1. I have studied Geology at Lakehead University in Thunder Bay, Ontario and have received a Bachelor of Sciences degree in Geology in 1990.

2. I have continuously practiced by profession as an exploration and mine geologist since graduation in Ontario, Quebec, North West Territories, Nunavut, British Columbia, Alaska, Arizona, Indonesia and Australia.

3. I have completed courses since graduation including: a) Epithermal to Porphyry Environments- Ore Textures, Brecciation, Hydrothermal Alteration and Paragenesis; b) SW Pacific Gold/Copper Systems- Structure, Alteration and Mineralization; c) Exploration Tools for Volcanogenic Massive Sulphide Deposits

4. I co-supervised the 2000 exploration program on the Kemess

Dated at Bulyanhulu Mine, Tanzania, the 2nd day of February, 2001

Brett R. LaPeare

16.0 REFERENCES

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17.0 LIST OF APPENDICES

Appendix 1	Kemess South Mine: Drill Hole Log, Geotechnical Drill Hole Log, Assay Summary, Assay Certificate and 1:1,000 Section for Drill Hole 2000-06
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APPENDIX 1: KEMESS SOUTH MINE

1. **Geological Drill Log 2000-06**
2. **Geotechnical Drillhole Log 2000-06**
3. **Drill Hole Assay Results for 2000-06**
4. **Assay Certificates for Drill Hole 2000-06**
5. **Figure 11: 1:1,000 Drill Hole Section 2000-06**

SYNOPTIC DRILL LOG
NORTHGATE EXPLORATION LTD.
KEMESS PROJECT

D.D.H. NO. 2000-06 **PAGE 1 OF** 1

NORTHING	9898.58	TOTAL DEPTH	314.46 m
EASTING	9426.15	TOATL CASING	6.10 m
ELEVATION	1316.77	DATE START	29/10/2000
PROJECT/AREA	Kemess South mine	DATE END	02/11/2000
AZIMUTH	045°	CORE DIAMETER	NQ
INCLINATION	-65°	GEOLOGIST	Adrian D. Bray

SAMPLE SERIES: 14766 **TO** 14852

① 14766-14772 (ABA Samples)
② 14773-14778 (ABA + Assay)
③ 14779-14812 (Assay)
④ 14813-14852 (ABA)

TARGET/PURPOSE: Stratigraphic Hole to test for structure + stratigraphy west of the ultimate pit limits in an area that has received limited historical drilling

COMMENTS (target intersected? / describe):

Downhole Survey

Depth	Type	Azimuth	Dip
100 m		045°	-62.5°
200 m		044.5°	-63°
300 m		048°	-63°

*Azm suspect

From	To	Rock Type	Alteration	Mineralization	Comments
0.00	6.10	Casing			
6.10	139.60	Polymictic Pebble Conglomerate	clay/(hem)	no visible sulphides	Native copper 128.30-139.60 m
139.60	143	(Qtz) Monzonite: Supergene	ser/clay +/- sil (hem)	trace Native Cu 10-12% hem	
143	207.35	(Qtz) Monzonite: Hypogene	ser/clay/hem	3-4% py, 3-5% mag, tr-0.5% cpy	30-35% qtz stockwork
207.35	224.30	Fault Zone	clay	traces py	
224.30	227.83	Mafic Dyke	chl +/- ser	traces py	
227.83	229.80	Qtz Monzonite: Hypogene	Kspr, sil	traces py	
229.80	249.42	Takla Seds: Cherty S.stone	sil	traces py	
249.42	251.65	Int. - Mafic Dyke	Kspr, epidote, chl	no visible sulphides	
251.65	288.25	Takla Seds: cherty S.stone	sil	traces py	
288.25	290.48	Int. - Mafic Dyke	chl	no visible sulphides	
290.48	291.08	Takla seds: cherty s.stone	sil	traces py	
291.08	292.12	Mafic Dyke	chl +/- ser	no visible sulphides	
292.12	295.28	Takla Seds.: Cherty S.stone	sil	traces py	
295.28	297.57	Int. Plagioclase Dyke	sil	no visible sulphides	
297.57	308.55	Takla Seds: cherty S.stone	sil	traces py	
305.55	314.46	Int. (Andesite) Dyke	chl/sil	no visible sulphides	

D.D.H. NO. 2000-06

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
0.00	6.10	Casing						
6.10	139.60	**Polymictic Pebble Conglomerate (Tertiary Sediments)**						
		- patchy weak to moderately magnetic						
		- dark reddish-brown, locally greyish green, very fine grained to fine grained muddy to (sandy) matrix with 25-(30)% 1-70 mm subrounded to subangular to irregular shaped polymictic/hetrolithic fragments, largely matrix supported but locally clast supported over intervals to approximately 1.50 metres						
		- fragment compostion, in order of decreasing abundance, includes:						
		a) whitish to light greenish sercitic/clay altered (qtz monzonite)						
		b) dark reddish-brown very fine grained to fine grained , same composition as the matrix						
		c) black aphanitic (mudstone)						
		d) greenish chloritic altered andesite						
		e) greyish aphanitic clay altered						
			14766	40.06	40.76			
		- the unit is massive, or could be thickly bedded and crudely fining-up as it does appear as if the fragments coarsen	14767	59.04	59.95			
		somewhat down the interval; locally the long axis of the fragments appear to be weakly oriented @ 60 to 80 degrees to	14768	62.64	64.12			
		the core axis	14769	82.74	84.08			
		- scattered narrow clay-rich gouges, weak shears and calcite matrix to clast supported breccias						
		- weak-(mod) clay altered, hematite? pervasive to matrix (reddish-brown colour)						
		- average 3-4% <1-25 mm calcite stringers/veinlets @ 65 to 80 degrees to the core axis						
		- no visible sulphides, traces of native copper towards the base of the unit						
		- the lower contact is marked by a 30 cm clay-rich fault gouge @ 80 degrees to the CA						

D.D.H. NO. 2000-06

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
		8.27-8.29: clay-rich gouge @ 80 degrees to the core axis						
		9.18-9.22: clay-rich gouge @ 60 degrees to the core axis						
		11.90-11.95: clay-rich gouge @ 50 degrees to the core axis						
		15.06-15.08: clay-rich gouge @ 75 degrees to the core axis						
		20.82-20.86: clay-rich gouge @ 70 degrees to the core axis						
		33.02-33.08: clay-rich gouge @ approximately 80 degrees to the core axis						
		33.40-33.65: clay-rich gouge @ 80 degrees to the core axis						
		34.12-34.20: clay-rich gouge @ 80 degrees to the core axis						
		40.31-40.34: minor clay-rich gouge @ 75 degrees to the core axis						
		65.10-65.90: shear fabric @ 85 degrees to the core axis, minor clay-rich gouge						
		69.95-70.45: calcite matrix to fragment supported breccia						
		71.75-71.81: minor clay-rich gouge @ 80 degrees to the core axis						
		82.75-84.43: fragment supported						
		84.43-84.60: clay-rich gouge @ approximately 75 degrees to the core axis						
		91.70-92.00: blocky core	14770	121.30	124.30			
		92.87-92.90: clay-rich gouge @ 45 degrees to the core axis	14771	124.30	126.30			
		93.88-93.90: clay-rich gouge	14772	126.30	128.30			
		96.50-98.00: rubbly to (blocky) core, soft friable clay altered, poor core recovery	14773	128.30	130.30			
		97.50-100.00: fragment supported	14774	130.30	132.30			
		99.00-112.50: blocky core, moderately clay altered	14775	132.30	134.30			
		120.70-123.25: fragment to (matrix) supported	14776	134.30	136.30			
		128.30-139.60: trace to <0.5% native copper as irregular <1-15 mm smears and blebs	14777	136.30	138.30			
			14778	138.30	139.60			

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
139.60	143.00	**(Quartz) Monzonite: Supergene**	14779	139.60	141.30			
			14780	141.30	143.00			
		- strong fine irregular micro fractured to brecciated with 10-12% hematite as fracture fill						
		- much of the original texture is obscured by the intense fracturing and brecciation						
		- patchy sericite and clay altered +/- silicified						
		- no visible sulphides, rare trace native copper within 50 cm of the upper contact						
		- the lower contact is gradational over 10 cm, marked by a drop in hematite and the appearance of magnetite						
143.00	207.35	**(Quartz) Monzonite: Hypogene**	14781	143.00	145.00			
			14782	145.00	147.00			
		- patchy tannish to yellowish to orangy greyish in colour	14783	147.00	149.00			
		- 40-(50)% whitish to whitish green to whitish orange 1-4 mm subhedral to euhedral feldspar in a very fine grained	14784	149.00	151.00			
		matrix, (fine-grained) to medium-grained porphyritic; rare traces of mafic minerals	14785	151.00	153.00			
		- the upper and lower sections of the unit are weak to moderately sericite and clay altered, while the core of the unit is	14786	153.00	155.00			
		moderately to stronly potassic altered	14787	155.00	157.00			
		- well developed quartz stockwork averaging 30-35% veining from 1-40 mm in width; no consistent oreintation of the	14788	157.00	159.00			
		veining; rare clay-rich gouge to 5 cm	14789	159.00	161.00			
		- average 3-(4)% pyrite predominately as fracture fill, rare stringers/veinlets, and as fine disseminations; 3-5% magnetite	14790	161.00	163.00			
		as fine irregular fracture fill, within qtz veining and as irregular 1-10 mm clots; trace to <0.5% chalcopyrite as 1-4 mm	14791	163.00	165.00			
		blebs largely confined to the quartz veining	14792	165.00	167.00			
		- the lower contact is sharp and sheared at 40 degrees to the core axis	14793	167.00	169.00			
			14794	169.00	171.00			

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
		143.00-166.00: largely sericite/clay altered with very minor potassic alteration	14795	171.00	173.00			
		152.95-153.00: vuggy coarse-grained pyrite/talc/clay/chl gouge @ 55 degrees to the core axis	14796	173.00	175.00			
		158.05-158.17: clay-rich pyritic gouge @ 45 degrees to the core axis	14797	175.00	177.00			
		159.26: 2-3 mm clay-rich gouge @ 50 degrees to the core axis	14798	177.00	179.00			
		159.90-159.96: clay-rich gouge @ 45 degrees to the core axis	14799	179.00	181.00			
		166.53: 10 mm clay-rich gouge @ 60 degrees to the core axis	14800	181.00	183.00			
		166.00-198.00: dominately potassic altered with lesser sericite and clay alteration	14801	183.00	185.00			
		173.57-173.62: pitted to vuggy very fine grained pyrite +/- black clay/chlorite @ 50 degrees to the core axis	14802	185.00	187.00			
		176.50-176.80: strongly brecciated, clay-rich matrix to fragment supported with sharp 2 cm lower clay-rich gouge contact	14803	187.00	189.00			
		@ 65 degrees to the core axis	14804	189.00	191.00			
		181.51: 1-2 mm clay-rich gouge @ 30 degrees to the core axis	14805	191.00	193.00			
		185.12-185.19: clay/(pyrite)-rich breccia with clay-rich upper and lower gouge contacts @ 35 and 55 degrees to the core	14806	193.00	195.00			
		axis, respectively	14807	195.00	197.00			
		198.00-207.35: largely sericite/clay altered with minor potassic alteration	14808	197.00	199.00			
		207.25-207.35: strongly sheared @ 40 degrees to the core axis; 8-10% 1-6 mm subrounded to elongate milled rock fragment	14809	199.00	201.00			
		in a dark black chlorite?/pyrite? matrix	14810	201.00	203.00			
			14811	203.00	205.00			
			14812	205.00	207.35			

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
207.35	224.30	**Fault Zone**	14813	207.35	209.40			
			14814	209.40	212.45			
		207.35-211.80: 35-40% subrounded to subangular 2-100 mm (quartz) monzonite and quartz veining milled fragments	14815	212.45	215.49			
		in a pervasively clay-rich gouge matrix, matrix to fragment supported; traces of pyrite to the fragments,	14816	215.49	218.54			
		as fine irregular fracture fill and as fine disseminations	14817	218.54	221.59			
			14818	221.59	224.30			
		211.80-222.90: faulted to strongly brecciated light grey to black siltstone and mudstone; strong clay alteration to the						
		siltstone/mudstone and pervasive clay-rich gouge matrix; scattered brecciated quartz veins and rare (quartz)						
		monzonite fragments, largely fragment supported; average <1% pyrite and fine disseminations: 6-8%						
		calcite as fine irregular fracture fill @ all angles to the core axis						
		222.90-227.30: brecciated black clay altered mudstone and greyish-green silicified/cherty siltstone						
		the lower contact is sharp @ 35 degrees to the core axis						
224.30	227.83	**Mafic Dyke**	14819	224.30	226.00			
			14820	226.00	227.83			
		- massive, bleached/mottled light to dark greenish; non-magnetic						
		- very fine grained matrix with 25-30% euhedral to subhedral 1-4 mm black to whitish chlorite +/- sericite altered pyroxene						
		- moderately chlorite +/- very weak sericite altered						
		- 2-(3)% 1-15 mm carbonate/(quartz) stringers and veins @ variable angles to the core axis						
		- the lower contact is sharp but irregular @ approximately 60 degrees to the core axis						

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
227.83	229.80	**Quartz Monzonite: Hypogene**	14821	227.83	229.80			
		- description as per 143.00 to 207.35 metres						
		- patchy weak-moderate potassically altered and silicified						
		- 1-2% 1-(3) mm subrounded quartz						
		- trace pyrite as fine irregular fracture fill						
		- unit lacks quartz veining						
		- sharp lower fault contact @ 25 degrees to the core axis						
229.80	249.42	**Takla Sediments: Cherty Siltstone**	14822	229.80	230.73			
		- (90)-95% bleached light greyish to greyish-(greeny) aphanitic cherty siltstone with 5-(10)% tannish to beigy to greyish	14823	230.73	233.71			
		clay altered +/- very weak silicified silty/muddy interbeds 0.1-17 cm in width, ranging from 20 to 80 degrees to the core	14824	233.71	236.76			
		axis, but predominately @ 50 to 70 degrees to the core axis; core typically breaks along these interbeds	14825	236.76	239.80			
		- (weak_ to moderately fine irregular micro fractured throughout, core is generally blocky	14826	239.80	242.55			
		- <1% 1-4 mm calcite stringers @ variable angles to the core axis	14827	242.55	244.68			
		- rare traces of pyrite as fine irregular fracture fill	14828	244.68	247.05			
		- the lower contact is sharp @ 55 degrees to the core axis	14829	247.05	249.42			

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
249.42	251.65	**Intermediate to Mafic Dyke**	14830	249.42	251.65			
		- massive, fine irregular micro fractured; patchy weak to moderately magnetic						
		- medium greyish to weak (greenish), very fine grained matrix with 8-10% 1-4 mm subhedral to (euhedral) whitish to orangy to yellowish green potassic and epidote altered feldspar and mafic phenocrysts						
		- fine irregular micro fractures typically infilled by epidote						
		- no visible sulphides						
		- the lower contact is sharp @ 60 degrees to the core axis						
251.65	288.25	**Takla Sediments: Cherty Siltstone**	14831	251.65	255.04			
			14832	255.04	258.09			
		- 90-95% bleached light greyish to greyish-(greeny) aphanitic cherty siltstone with 5-10% tannish to beigy to greyish	14833	258.09	261.13			
		clay altered +/- very weak silicified silty/muddy interbeds 0.1-17 cm in width, ranging from 20 to 80 degrees to the core	14834	261.13	262.96			
		axis, but predominately @ 50 to 70 degrees to the core axis; core typically breaks along these interbeds	14835	262.96	267.23			
		- (weak_ to moderately fine irregular micro fractured throughout, core is generally blocky	14836	267.23	270.27			
		- <1% 1-4 mm calcite stringers @ variable angles to the core axis	14837	270.27	273.32			
		- rare traces of pyrite as fine irregular fracture fill	14838	273.32	276.37			
		- the lower contact is obscured by rubbly core	14839	276.37	279.42			
			14840	279.42	282.46			
		279.00-285.00: cherty sediments are a darker greyish to black in colour and become very fine grained as opposed to	14841	282.46	285.51			
		aphanitic; the sediments are also patchy moderately magnetic; a number of the coarser silty interbeds	14842	285.51	288.25			
		contain angular 1-10 mm dark black magnetic mudstone? rip-up clasts?; this could be an interval of	14843	288.25	290.48			
		intermixed cherty siltstone and intermediate to mafic dyke material						
288.25	290.48	**Intermediate to Mafic Dyke**						
		- description as per 249.42 to 251.65 metres, but lacks the epidote alteration						
		- the lower contact is sharp @ 60 degrees to the core axis						

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
290.48	291.08	**Takla Sediments: Cherty Siltstone**	14844	290.48	292.12			
		- description as per 229.80 to 249.42 metres						
		- the lower contact is obscured by rubbly core						
291.08	292.12	**Mafic Dyke**						
		- description as per 224.30 to 227.83 metres, but moderately magnetic and no visible sulphides						
		- mafics appear to be very weakly epidote altered						
		- the lower contact si irregular at approximately 40 degrees to the core axis						
292.12	295.28	**Takla Sediments: Cherty Siltstone**	14845	292.12	295.28			
		- description as per 279 to 285 metres						
		- the lower contact is irregular at approximately 30 degrees to the core axis						
295.28	297.57	**Intermediate Plagioclase Dyke**	14486	295.28	297.57			
		- massive, non-magnetic						
		- light greyish, very fine grained matrix with 15-(20)% 1-8 mm whitish subhedral to euhedral feldspars						
		- no visible sulphides						
		- the lower contact is a bit irregular, but sharp @ 65 degrees to the core axis						

From	To	DESCRIPTION	Sample #	From	To	%Cu	Au g/t	Ag g/t
297.57	**308.55**	**Takla Sediments: Cherty Siltstone**	14847	297.57	300.44			
			14848	300.44	303.49			
		- description as per 229.80 to 249.92 metres, but <2% clay +/- epidote altered interbeds; core is more competant and not	14849	303.49	306.53			
		blocky; interval is also chloritic altered	14850	306.53	308.55			
		- the lower contact is sharp @ 50 degrees to the core axis						
308.55	**314.46**	**Intermediate (Andesitic) Dyke**	14851	308.55	312.32			
			14852	312.32	314.46			
		- massive, moderately magnetic						
		- light greyish, very fine grained matrix w/ very fine grained to fine grained whitish ghosted subhedral to anhedral <1 mm						
		feldspars						
		- 1% clacite/epidote as fine irregular fracture fill						
		- core is blocky throughout						
		- moderately chloritic +/- silicified						
		- no visible sulphides						
		- the lower contact is the end of the hole						
314.46	**314.46**	**EOH**						

Knight Piésold
CONSULTING

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
(NON-ORIENTED DRILLCORE)

Project:	Kemess	Logged by	Paarup	Date	Oct. 30, 2000	Hole No.	2000-6	Azimuth	045	Sheet	1
Location:	10312.043 N 10165.227 E					Hole Dia.		Inclination	-65		

Intact Rock Hardness

Hardness	Estimated UCS, MPa	Description	Field Performance
0	0.25 - 1.0	Extremely weak rock	Indented by thumbnail
1	1.0 - 5.0	Very weak rock	Crumbles under firm blows with the point of a geological pick; can be peeled with a pocket knife
2	5.0 - 25	Weak rock	Can be peeled with a pocket knife with difficulty; shallow indentations made by firm blow of geological pick
3	25 - 50	Medium Strong rock	Cannot be scrapped or peeled with a pocket knife; specimen can be fractured with a single blow of geological pick
4	50 - 100	Strong rock	Specimen requires more than one blow with hammer and/or geological pick to fracture it
5	100 - 250	Very strong rock	Specimen requires many blows of hammer and/or geological pick to fracture it
6	> 250	Extremely strong rock	Specimen can only be chipped with geological pick

Joint Condition

PERSISTENCE	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m
Rating	6	4	2	1	0
APERTURE	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10
Rating	6	5	4	1	0
ROUGHNESS	V Rough	Rough	SL Rough	Smooth	Slicks
Rating	6	5	3	1	0
INFILLING	None	Hard Infilling		Soft Infilling	
		< 5 mm	> 5 mm	< 5mm	> 5 mm
Rating	6	4	3	2	0
WEATHERING	Unweathered	SW	MW	HW	Decomposed
Rating	6	5	3	1	0

Joint Weathering

Rating	Description
0	Completely weathered - original fabric and relict structures remain but, rock is decomposed and friable
1	Highly weathered - rock is discolored and strength is significantly reduced by weathering
3	Moderately weathered - rock is discolored, but strength is only slightly affected, discontinuities weathered
5	Slightly weathered - rock strength unchanged, weathering on joints only
6	Fresh and Unweathered

Joint Roughness

Rating	Description
0	Polished or Slickensided
1	Smooth, Planar
3	Slightly Rough, Undulating
5	Rough Undulating/Stepped
6	Very Rough, Stepped

BOX	INTERVAL (ft)			RECOVERY		RQD		LONG	HARD	PLST	No.	PLST	JOINT CONDITION					Geological Description
	FROM	TO	LENGTH	ft	%	ft	%	ft		UCS	Joints	Depth	PERSIS	APER	ROUGH	INFILL	WTHR	(Rock Type, Colour, Texture, Alteration, Structure)
	0	6.1	6.1		0		0											Casing
1	6.1	8.23	2.13	1.62	76.1%	1.4	65.7%		2-3	<1	6	6.78		5	3	6	6	Tertiary Seds - matrix supported, granular to pebble conglomerate, massive, subrounded to subangular sericited green to black clasts in a grey to black, primarily muddy to sandy matrix, heterolithic, polymictic.
1	8.23	11.28	3.05	2.76	90.5%	2.51	82.3%		2-3	2.5	5	10.85		1	3	6/0	5	as above. Fault gouge 8.27-8.29, 9.18-9.22
1/2	11.28	14.33	3.05	3	98.4%	2.7	88.5%		2-3	1.5	10	12.3		1	3	6/0	6	as above. Gouge/clay 11.8-11.85, 12.25-12.3, 12.5
2	14.33	17.38	3.05	3.02	99.0%	2.63	86.2%		0-3	0	8	16.67		5	3	5	5-6	as above. Soft argillite gouge 15.02-15.04
2/3	17.38	20.42	3.04	3.03	99.7%	2.7	88.8%		3	0	9	18.97		5	3	6	6	as above. Minor wispy qt/cal stockworks <1cm.
3	20.42	23.47	3.05	3.01	98.7%	2.62	85.9%		2-3	0	8	22.38		5	3	4	6	as above. Gouge 20.82-20.86
3/4	23.47	26.52	3.05	3.07	100.7%	3.03	99.3%		2-3	3	9	25.64		5	3	6	6	as above. Massive granular polmictic conglomerate.
4	26.52	29.57	3.05	2.95	96.7%	2.59	84.9%		2-3	4	4	28.1		5	3	3	6	minor gouge 29.1-29.11
4/5	29.57	32.61	3.04	3	98.7%	2.74	90.1%		2-3	0	9	30.13		5	3	6	6	pebble conglomerate - white subangular felsic clasts supported in brownish-red mud matrix
5	32.61	35.66	3.05	3.08	101.0%	2.62	85.9%		1-2	0	15	33.25		4	3	0	6	granular pebble conglomerate - increased sericitic alteration adjacent to frequent gouge - 33.02-33.08 and 33.4-33.65 and 34.12-34.20.
6	35.66	38.71	3.05	3.08	101.0%	2.67	87.5%		2	0	16	38.04		4	3	2	6	granular pebble conglomerate - weakly bedded at 75-80 degrees to core axis, accentuated by subangular elongate sericited clasts.
6/7	38.71	41.76	3.05	3.08	101.0%	2.67	87.5%		2	<1	13	40.81		4	3	2	6	as above, minor bedding, minor gouge 40.31-40.34
7	41.76	44.81	3.05	3.01	98.7%	2.81	92.1%		2	<1	8	43.66		5	1	4	6	massive granular conglomerate, minor calcite stockwork.
7/8	44.81	47.85	3.04	2.98	98.0%	2.65	87.2%		2	<1	11	46.55		5	3	4	6-5	as above granular conglomerate - grey muddy matrix.

Knight Piésold
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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
(NON-ORIENTED DRILLCORE)

Project:	Kemess	**Logged by**	Paarup	**Date**	Oct. 30, 2000	**Hole No.**	2000-6	**Azimuth**	045
Location:	10312.043 N 10165.227 E					**Hole Dia.**		**Inclination**	-65
								Sheet	2

Intact Rock Hardness

Hardness	Estimated UCS, MPa	Description	Field Performance
0	0.25 - 1.0	Extremely weak rock	Indented by thumbnail
1	1.0 - 5.0	Very weak rock	Crumbles under firm blows with the point of a geological pick; can be peeled with a pocket knife
2	5.0 - 25	Weak rock	Can be peeled with a pocket knife with difficulty; shallow indentations made by firm blow of geological pick
3	25 - 50	Medium Strong rock	Cannot be scrapped or peeled with a pocket knife; specimen can be fractured with a single blow of geological pick
4	50 - 100	Strong rock	Specimen requires more than one blow with hammer and/or geological pick to fracture it
5	100 - 250	Very strong rock	Specimen requires many blows of hammer and/or geological pick to fracture it
6	> 250	Extremely strong rock	Specimen can only be chipped with geological pick

Joint Condition

PERSISTENCE	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m
Rating	6	4	2	1	0
APERTURE	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10
Rating	6	5	4	1	0
ROUGHNESS	V Rough	Rough	SL Rough	Smooth	Slicks
Rating	6	5	3	1	0
INFILLING	None	Hard Infilling		Soft Infilling	
		< 5 mm	> 5 mm	< 5mm	> 5 mm
Rating	6	4	3	2	0
WEATHERING	Unweathered	SW	MW	HW	Decomposed
Rating	6	5	3	1	0

Joint Weathering

Rating	Description
0	Completely weathered - original fabric and relict structures remain but, rock is decomposed and friable
1	Highly weathered - rock is discolored and strength is significantly reduced by weathering
3	Moderately weathered - rock is discolored, but strength is only slightly affected, discontinuities weathered
5	Slightly weathered - rock strength unchanged, weathering on joints only
6	Fresh and Unweathered

Joint Roughness

Rating	Description
0	Polished or Slickensided
1	Smooth, Planar
3	Slightly Rough, Undulating
5	Rough Undulating/Stepped
6	Very Rough, Stepped

BOX	INTERVAL (ft)			RECOVERY		RQD		LONG	HARD	PLST	No.	PLST	JOINT CONDITION					Geological Description
	FROM	TO	LENGTH	ft	%	ft	%	ft		UCS	Joints	Depth	PERSIS	APER	ROUGH	INFILL	WTHR	(Rock Type, Colour, Texture, Alteration, Structure)
8	47.85	50.9	3.05	3.03	0.99344	2.68	87.9%			<1	7	50.08		4	3	3	6	as above. Granular conglomerate
8/9	50.9	53.95	3.05	3.05	100.0%	2.45	80.3%		2/1	0	13	52.45		4	3	3	6	conglomerate. Minor shear at 51.00
9	53.95	57	3.05	2.93	96.1%	2.8	91.8%		2	<1	5	55.99		4	3	5	6	zones of pebbly conglomerate
9/10	57	60.05	3.05	2.99	98.0%	2.68	87.9%		2/3	3	8	58.9		4	3	5	6	pebble sized clasts, subrounded-subangular
10	60.05	63.09	3.04	3.07	101.0%	2.8	92.1%		3/2	3	5	60.65		4	3	5	6	granular-pebble conglomerate - clast supported, sandy matrix
10/11	63.09	65.14	2.05	2.9	141.5%	2.6	126.8%		1/2	0	10	64.82		4	3	4	6	as above. Seritization, weak bedding at 75 degrees to core axis.
11	66.14	69.19	3.05	3.08	101.0%	2.77	90.8%		2/1	<1	10	68.04		4	3	4	6	granular conglomerate, massive
11/12	69.19	72.24	3.05	2.81	92.1%	2.12	69.5%		2/1	<1	16	70.6		4	3/0	4	6	69.95-70.45 - bx zone, recemented by qtz, 71.75-71.81 - minor gouge; 71.0 grading into brown mudstone - softer - low RQD.
12	72.24	75.29	3.05	2.8	91.8%	2.1	68.9%		2/1	<1	12	73.56		4	3/0	4	6	72.24-73.5 brownish mudstone, low RQD, weakly bedded at 75 degrees to core axis
12/13	75.29	78.33	3.04	3.1	102.0%	2.84	93.4%		2	<1	6	76.52		4	3	5	6	granular to pebble conglomerate - mainly grey mud matrix - massive
13	78.33	81.38	3.05	2.88	94.4%	2.83	92.8%		2	<1	3	79.5		4	3	6	6	as above, weakly bedded at 55 degrees to core axis.
13/14	81.38	84.43	3.05	2.7	88.5%	2.17	71.1%		2	<1	10	82.56		4	3	6	6	82.75-84.43 pebble-cobble conglomerate - clast supported, subrounded to subangular clasts of volcanic and lithic origin.
14	84.43	87.48	3.05	3.01	98.7%	1.68	55.1%		2/0	<1	25	85.41		1	3	0	6	granular conglomerate - weakly bedded to massive. Fault gouge 84.43-84.6; 84.72-84.88, 86.3-89.62
14/15	87.48	89.31	1.83	2.46	134.4%	1.18	64.5%		2/0	1	15	89		4	3	0	6	as above, fault gouge 89.30-89.62.
15	89.31	90.51	1.2	0.76	63.3%	0.76	63.3%		2	<1	1	90.35		6	1	5	6	as above
15	90.51	93.57	3.06	3.05	99.7%	2.01	65.7%		2/1	<1	17	92.47		4	3/0	5	6	matrix supported granular-pebble conglomerate 91.70-92-blocky ground due to jointing. 92.87-fault gouge.
15/16	93.57	96.62	3.05	0.47	15.4%	0	0.0%		1/0	0	8	no test		1	3	1	6	friable soft (argillic?) gouge - 93.88; 96.55 - lost 2.58 m
16	96.62	97.84	1.22	0.28	23.0%	0	0.0%		1	<1	0							conglomerate - poor recovery, very rubbly

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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
(NON-ORIENTED DRILLCORE)

Project:	Kemess	Logged by	Paarup	Date	Oct. 30, 2000
Location:	10312.043 N 10165.227 E				
Hole No.	2000-6	Azimuth	045	Sheet	3
Hole Dia.		Inclination	-65		

Intact Rock Hardness

Hardness	Estimated UCS, MPa	Description	Field Performance
0	0.25 - 1.0	Extremely weak rock	Indented by thumbnail
1	1.0 - 5.0	Very weak rock	Crumbles under firm blows with the point of a geological pick; can be peeled with a pocket knife
2	5.0 - 25	Weak rock	Can be peeled with a pocket knife with difficulty; shallow indentations made by firm blow of geological pick
3	25 - 50	Medium Strong rock	Cannot be scrapped or peeled with a pocket knife; specimen can be fractured with a single blow of geological pick
4	50 - 100	Strong rock	Specimen requires more than one blow with hammer and/or geological pick to fracture it
5	100 - 250	Very strong rock	Specimen requires many blows of hammer and/or geological pick to fracture it
6	> 250	Extremely strong rock	Specimen can only be chipped with geological pick

Joint Condition

PERSISTENCE	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m
Rating	6	4	2	1	0
APERTURE	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10
Rating	6	5	4	1	0
ROUGHNESS	V Rough	Rough	SL Rough	Smooth	Slicks
Rating	6	5	3	1	0
INFILLING	None	Hard Infilling		Soft Infilling	
		< 5 mm	> 5 mm	< 5mm	> 5 mm
Rating	6	4	3	2	0
WEATHERING	Unweathered	SW	MW	HW	Decomposed
Rating	6	5	3	1	0

Joint Weathering

Rating	Description
0	Completely weathered - original fabric and relict structures remain but, rock is decomposed and friable
1	Highly weathered - rock is discolored and strength is significantly reduced by weathering
3	Moderately weathered - rock is discolored, but strength is only slightly affected, discontinuities weathered
5	Slightly weathered - rock strength unchanged, weathering on joints only
6	Fresh and Unweathered

Joint Roughness

Rating	Description
0	Polished or Slickensided
1	Smooth, Planar
3	Slightly Rough, Undulating
5	Rough Undulating/Stepped
6	Very Rough, Stepped

BOX	INTERVAL (ft)			RECOVERY		RQD		LONG	HARD	PLST	No.	PLST	JOINT CONDITION					Geological Description
	FROM	TO	LENGTH	ft	%	ft	%	ft		UCS	Joints	Depth	PERSIS	APER	ROUGH	INFILL	WTHR	(Rock Type, Colour, Texture, Alteration, Structure)
16	97.89	99.67	1.78	1.65	92.7%	1.48	83.1%		0/2	<1	2	visual		4	3	6	6	conglomerate: clast supported, very soft, hematite/clay rich matrix
16	99.67	102.11	2.44	2.6	106.6%	1.08	44.3%		0/2	<1	3	visual		4	3	6	6	as above, w/shear at 99.95-100.1
16	102.11	102.72	0.61	0.49	80.3%	0.37	60.7%		0/2	<1	0	visual						as above, one clast ~6cm
16/17	102.72	105.77	3.05	2.63	86.2%	0.68	22.3%		0/2	<1	2	visual		4	3	6	6	as above, clasts are generally <1cm, matrix supported
17	105.77	108.81	3.04	3.1	102.0%	0.71	23.4%		0/2	<1	7	visual		4	3	6	6	as above, same as previous intersection
17/18	108.81	111.86	3.05	2.58	84.6%	1.44	47.2%		0/2	<1	2	visual		4	3	6	6	as above, locally 100% clay (110.3 m)
18	111.86	114.91	3.05	2.64	86.6%	1.93	63.3%		1/2	<1	3	visual		4	3	6	6	as above, inc. in clasts, matrix is slightly harder
18/19	114.91	117.96	3.05	3.05	100.0%	2.72	89.2%		2	1	0	115.33						as above
19	117.96	121.01	3.05	2.92	95.7%	2.92	95.7%		2	4	0	119.5						as above, harder, iron rich matrix, 20-25% clasts
19/20	121.01	124.05	3.04	3.06	100.7%	2.96	97.4%		2	1	0	122.2						as above, mostlry clast supported, clasts < 5cm
20/21	124.05	127.1	3.05	3.13	102.6%	3.13	102.6%		2	<1	0	125.55						pebble conglomerate, clasts <1cm at 15% at intersection
21	127.1	130.15	3.05	3.06	100.3%	2.98	97.7%		2	4	0	128.6						pebble conglomerate, local clasts 2-5 cm but rare
21/22	130.15	133.2	3.05	3.1	101.6%	2.99	98.0%		2	5	1	132.4		4	3	6	6	pebble conglomerate, clasts < 3mm, matrix slightly more Fe rich
22	133.2	136.25	3.05	2.97	97.4%	2.97	97.4%		2	3	0	134.65						pebble conglomerate, more polymictic
22/23	136.25	139.29	3.04	3.26	107.2%	3.13	103.0%		2	4.5	0	137.75						pebble conglomerate, Fe depletion at lower 75 cm of unit
23	139.29	142.34	3.05	3.12	102.3%	2.34	76.7%		0/3	<1	3	140.85		4	3	6	6	Shear/Fault at 139.25 to 139.60/Conglomerate at 139.60-140.00/Monzodiorite
23/24	142.34	145.39	3.05	3	98.4%	2.64	86.6%		3/4	<1	3	143.85		4	3	6	6	Qtz Monzonite - upper 1 m is oxidized, rest is argillic/sericite alteration
24	145.39	148.44	3.05	3.15	103.3%	2.73	89.5%		3/4	<1	5	147.1		4	3	6	6	as above, 35-50% qtz unit stockwork (also above)
24/25	148.44	151.49	3.05	3.05	100.0%	2.78	91.1%		3/4	<1	3	149.8		4	3	6	6	as above, alteration is mostly sericitic

Knight Piésold
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GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
(NON-ORIENTED DRILLCORE)

Project:	Kemess	Logged by	Paarup/Ma	Date	Oct. 30, 2000	Hole No.	2000-6	Azimuth	045
Location:	10312.043 N 10165.227 E					Hole Dia.		Inclination	-65
Sheet	4								

Intact Rock Hardness

Hardness	Estimated UCS, MPa	Description	Field Performance
0	0.25 - 1.0	Extremely weak rock	Indented by thumbnail
1	1.0 - 5.0	Very weak rock	Crumbles under firm blows with the point of a geological pick; can be peeled with a pocket knife
2	5.0 - 25	Weak rock	Can be peeled with a pocket knife with difficulty; shallow indentations made by firm blow of geological pick
3	25 - 50	Medium Strong rock	Cannot be scrapped or peeled with a pocket knife, specimen can be fractured with a single blow of geological pick
4	50 - 100	Strong rock	Specimen requires more than one blow with hammer and/or geological pick to fracture it
5	100 - 250	Very strong rock	Specimen requires many blows of hammer and/or geological pick to fracture it
6	> 250	Extremely strong rock	Specimen can only be chipped with geological pick

Joint Condition

PERSISTENCE	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m
Rating	6	4	2	1	0
APERTURE	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10
Rating	6	5	4	1	0
ROUGHNESS	V Rough	Rough	SL Rough	Smooth	Slicks
Rating	6	5	3	1	0
INFILLING	None	Hard Infilling		Soft Infilling	
		< 5 mm	> 5 mm	< 5mm	> 5 mm
Rating	6	4	3	2	0
WEATHERING	Unweathered	SW	MW	HW	Decomposed
Rating	6	5	3	1	0

Joint Weathering

Rating	Description
0	Completely weathered - original fabric and relict structures remain but, rock is decomposed and friable
1	Highly weathered - rock is discolored and strength is significantly reduced by weathering
3	Moderately weathered - rock is discolored, but strength is only slightly affected, discontinuities weathered
5	Slightly weathered - rock strength unchanged, weathering on joints only
6	Fresh and Unweathered

Joint Roughness

Rating	Description
0	Polished or Slickensided
1	Smooth, Planar
3	Slightly Rough, Undulating
5	Rough Undulating/Stepped
6	Very Rough, Stepped

BOX	INTERVAL (ft)			RECOVERY		RQD		LONG	HARD	PLST	No.	PLST	JOINT CONDITION					Geological Description
	FROM	TO	LENGTH	ft	%	ft	%	ft		UCS	Joints	Depth	PERSIS	APER	ROUGH	INFILL	WTHR	(Rock Type, Colour, Texture, Alteration, Structure)
25	151.49	154.53	3.04	2.97	97.7%	2.83	0.930921		4		5			5	3	2	6	fractured at top 20 cm - qtz monzonite veins x-cutting
25/26	154.53	157.58	3.05	3.07	100.7%	2.87	94.1%		4		5			5	3	2	6	as above, qtz monzonite x-cutting
26	157.58	160.63	3.05	2.98	97.7%	2.8	91.8%		4		3			5	3	2	6	as above, fault at 158.16 w/pyrite in gouge
26/27	160.63	163.07	2.44	2.47	101.2%	2.4	98.4%		4		4			5	2/3	2	6	as above
27	163.07	163.68	0.61	0.49	80.3%	0.34	55.7%		4		0			4	2	6	6	top of run fractured - hematite rick mudstone? - remainder as above
27-Jan	163.68	166.73	3.05	3.1	101.6%	3.1	101.6%		4		3			5	3	2	6	as above, mild red alteration spots around 166
27/28	166.73	169.77	3.04	3.1	102.0%	3.1	102.0%		4		7			5	3	4	6	as above
28/29	169.77	172.82	3.05	3.02	99.0%	3.02	99.0%		4		6			5	3	6	6	as above, red alteration spots around 171.6
29	172.82	175.87	3.05	2.98	97.7%	2.9	95.1%		4		5			5	3	6/0	6	as above, fault at 173.6, red alteration spots
29/30	175.87	178.92	3.05	3.08	101.0%	2.85	93.4%		4		4			5	3	6/0	6	as above, fault at 176.7, 176.84
30	178.92	181.97	3.05	2.95	96.7%	2.82	92.5%		4		5			5	3	2	6	as above, shears at 181.24 and 181.49
30/31	181.97	185.01	3.04	3.1	102.0%	3.1	102.0%		6/4		3			5	3	6	6	Monzodiorite - (as above), massive, potassic alteration, mod density at qtz veinlets
31	185.01	188.06	3.05	3.07	100.7%	2.67	87.5%		6/4		9			5	3	6	6	as above, slight increase in qtz stringers- very random stockwork
31/32	188.06	191.11	3.05	2.96	97.0%	2.77	90.8%		6/4/2		5			5	3	6/4	6	as above, clay altered/ possible fault at 190.68-190.83
32	191.11	194.16	3.05	2.95	96.7%	2.95	96.7%		6/3		7			5	3	6	6	Monzodiorite - massive, K-alteration w/local pervasive sericite alteration
32/33	194.16	197.21	3.05	3.09	101.3%	2.98	97.7%		6/3		3			5	3	6	6	as above but no sericite alteration
33	197.21	200.25	3.04	3.08	101.3%	3.06	100.7%		6/3		2			5	3	6/2	6	as above, increase in qtz veinlets and sericitic/argillitic alteration
33/34	200.25	203.3	3.05	3.14	103.0%	3.14	103.0%		6/3		5			5	3	6/2	6	as above
34	203.3	206.35	3.05	3.09	101.3%	3.09	101.3%		6/3		1			5	3	6	6	as above, units very random and irregular
34/35	206.35	209.4	3.05	3.09	101.3%	3.09	101.3%		6/3/2		0							Monzo-Fault Breccia-Fault - Weakly developed BY-diorite
35	209.4	212.45	3.05	3.03	99.3%	3.03	99.3%		1/2/3		0							Fault BY - continued from above - clay rich matrix w/altered dio and sed clasts
35/36	212.45	215.49	3.04	3.07	101.0%	2.87	94.4%		1/2/3		0							as above w/slight increase in sed clasts.

Knight Piésold
CONSULTING

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
(NON-ORIENTED DRILLCORE)

Project: Kemess
Location: 10312.043 N / 10165.227 E

Logged by: Paarup | **Date:** Oct. 30, 2000 | **Hole No.:** 2000-6 | **Hole Dia.:** | **Azimuth:** 045 | **Inclination:** -65 | **Sheet:** 5

Intact Rock Hardness

Hardness	Estimated UCS, MPa	Description	Field Performance
0	0.25 - 1.0	Extremely weak rock	Indented by thumbnail
1	1.0 - 5.0	Very weak rock	Crumbles under firm blows with the point of a geological pick; can be peeled with a pocket knife
2	5.0 - 25	Weak rock	Can be peeled with a pocket knife with difficulty; shallow indentations made by firm blow of geological pick
3	25 - 50	Medium Strong rock	Cannot be scrapped or peeled with a pocket knife; specimen can be fractured with a single blow of geological pick
4	50 - 100	Strong rock	Specimen requires more than one blow with hammer and/or geological pick to fracture it
5	100 - 250	Very strong rock	Specimen requires many blows of hammer and/or geological pick to fracture it
6	> 250	Extremely strong rock	Specimen can only be chipped with geological pick

Joint Condition

PERSISTENCE	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m
Rating	6	4	2	1	0
APERTURE	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10
Rating	6	5	4	1	0
ROUGHNESS	V Rough	Rough	SL Rough	Smooth	Slicks
Rating	6	5	3	1	0
INFILLING	None	Hard Infilling		Soft Infilling	
		< 5 mm	> 5 mm	< 5mm	> 5 mm
Rating	6	4	3	2	0
WEATHERING	Unweathered	SW	MW	HW	Decomposed
Rating	6	5	3	1	0

Joint Weathering

Rating	Description
0	Completely weathered - original fabric and relict structures remain but, rock is decomposed and friable
1	Highly weathered - rock is discolored and strength is significantly reduced by weathering
3	Moderately weathered - rock is discolored, but strength is only slightly affected, discontinuities weathered
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6	Fresh and Unweathered

Joint Roughness

Rating	Description
0	Polished or Slickensided
1	Smooth, Planar
3	Slightly Rough, Undulating
5	Rough Undulating/Stepped
6	Very Rough, Stepped

BOX	INTERVAL (ft)			RECOVERY		RQD		LONG	HARD	PLST	No.	PLST	JOINT CONDITION					Geological Description
	FROM	TO	LENGTH	ft	%	ft	%	ft		UCS	Joints	Depth	PERSIS	APER	ROUGH	INFILL	WTHR	(Rock Type, Colour, Texture, Alteration, Structure)
36/37	215.49	218.54	3.05	3.07	100.7%	3.03	0.993443		1/2/3		0							Takla sediments - Fault Zone-clay rich, black/grey w/local gouge
37	218.54	221.59	3.05	3.08	101.0%	3.08	101.0%		2/3/6		1			5	3	2	6	Fault/Takla mudstone; gouge rare below 219.0/quasi throughout
37/38	221.59	224.64	3.05	3.07	100.7%	3.07	100.7%		1/2/3		0							Fault to 222.88/mudstone to 223.32/mafic volcanic to 224.64 (end of run)
38	224.04	227.69	3.65	3.07	84.1%	2.96	81.1%		4		2			6	1	4	6	subvolcanic - frequent qtz veins with PY stringers
38/39	227.69	230.73	3.04	3.1	102.0%	2.23	73.4%		5/2		13			4	3/0	0	6	hypogene 230.0 - Takla sub 229.86-230.35-fault zone
39	230.73	233.71	2.98	2.95	99.0%	2.7	90.6%		5		7			4	1	3	6	interbedded Takla sediments - mudstone/chery siltstone
39/40	233.71	236.76	3.05	3.08	101.0%	2.22	72.8%		3/1									

Knight Piésold
CONSULTING

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
(NON-ORIENTED DRILLCORE)

Project: / Location:	Kemess 10312.043 N 10165.227 E	Logged by	Paarup/Ma/Lam/Lapeare	Date	Oct. 30, 2000	Hole No. / Hole Dia.	2000-6	Azimuth / Inclination	045 -65	Sheet 6

Intact Rock Hardness

Hardness	Estimated UCS, MPa	Description	Field Performance
0	0.25 - 1.0	Extremely weak rock	Indented by thumbnail
1	1.0 - 5.0	Very weak rock	Crumbles under firm blows with the point of a geological pick; can be peeled with a pocket knife
2	5.0 - 25	Weak rock	Can be peeled with a pocket knife with difficulty, shallow indentations made by firm blow of geological pick
3	25 - 50	Medium Strong rock	Cannot be scrapped or peeled with a pocket knife; specimen can be fractured with a single blow of geological pick
4	50 - 100	Strong rock	Specimen requires more than one blow with hammer and/or geological pick to fracture it
5	100 - 250	Very strong rock	Specimen requires many blows of hammer and/or geological pick to fracture it
6	> 250	Extremely strong rock	Specimen can only be chipped with geological pick

Joint Condition

PERSISTENCE	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m
Rating	6	4	2	1	0
APERTURE	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10
Rating	6	5	4	1	0
ROUGHNESS	V Rough	Rough	SL Rough	Smooth	Slicks
Rating	6	5	3	1	0
INFILLING	None	Hard Infilling		Soft Infilling	
		< 5 mm	> 5 mm	< 5mm	> 5 mm
Rating	6	4	3	2	0
WEATHERING	Unweathered	SW	MW	HW	Decomposed
Rating	6	5	3	1	0

Joint Weathering

Rating	Description
0	Completely weathered - original fabric and relict structures remain but, rock is decomposed and friable
1	Highly weathered - rock is discolored and strength is significantly reduced by weathering
3	Moderately weathered - rock is discolored, but strength is only slightly affected, discontinuities weathered
5	Slightly weathered - rock strength unchanged, weathering on joints only
6	Fresh and Unweathered

Joint Roughness

Rating	Description
0	Polished or Slickensided
1	Smooth, Planar
3	Slightly Rough, Undulating
5	Rough Undulating/Stepped
6	Very Rough, Stepped

BOX	INTERVAL (ft) FROM	TO	LENGTH	RECOVERY ft	%	RQD ft	%	LONG ft	HARD	PLST UCS	No. Joints	PLST Depth	JOINT CONDITION PERSIS	APER	ROUGH	INFILL	WTHR	Geological Description (Rock Type, Colour, Texture, Alteration, Structure)
39/40	233.71	236.76	3.05	3.06	100.3%	2.17	71.1%		2/3		9			5	3	2	6	bedded, light green-grey cherty siltstone w/brown mudstone - fault gouge
40	236.76	239.8	3.04	2.97	97.7%	2.75	90.5%		3		7			5	3	2	6	as above
40/41	239.8	242.55	2.75	2.83	102.9%	2.53	92.0%		2/3		6			5	3	2	6	as above, localized layers of mudstone
41	242.55	244.68	2.13	2.05	96.2%	1.76	82.6%		2/3		2			4	3	2	6	as above, 80% siliceous siltstone/20% thinly bedded mudstone
41	244.68	245.9	1.22	1.15	94.3%	0.84	68.9%		3/4		1			4	3	6/2	6	as above
41/42	245.9	248.94	3.04	3.13	103.0%	3	98.7%		3/4		1			4	3	6/2	6	as above
42	248.94	251.99	3.05	3.1	101.6%	2.38	78.0%		3/4		7			4	3/1	6/2	6	siltstone to 249.40, mafic dyke to 251.65 - siltstone to 251.99
42/43	251.99	255.04	3.05	3.09	101.3%	2.75	90.2%		3/4		5			4/1	3/1	6	6	siltstone/mudstone - 80% siliceous siltstone w/ thin softer mudstone beds
43	255.04	258.09	3.05	3.03	99.3%	3.03	99.3%		3/4		3			4	3/1	6	6	as above - 100 percent RQD
43/44	258.09	261.13	3.04	3.08	101.3%	2.78	91.4%		3/4		1			4	3/1	6	6	as above - good RQD
44	261.13	262.96	1.83	1.63	89.1%	1.45	79.2%		3/4		3			4	3/1	6	6	as above - blocked at end of 6' run
44	262.96	264.18	1.22	1.22	100.0%	1.03	84.4%		3/4		2			4	3/1	6	6	as above
45	264.18	267.23	3.05	3.07	100.7%	2.92	95.7%		3/4		2			4	3/1	6	6	as above
45/46	267.23	270.27	3.04	3	98.7%	2.93	96.4%		3/4		4			4	3/1	6/2	6	as above
46	270.27	273.32	3.05	3.05	100.0%	3.05	100.0%		3/4		3			4/0	3/1	6/2	6	mudstone/siltstone - increase to 40-50% mudstone and thicker beds
46/47	273.32	276.37	3.05	3.06	100.3%	2.92	95.7%		3/4		1			4	3	6/2	6	siltstone w/minor mudstone beds - 90%/10%
47	276.37	278.2	1.83	1.8	98.4%	1.44	78.7%		3/4		3			4	3	6	6	mudstone/siltstone
47	278.2	279.42	1.22	1.23	100.8%	1.14	93.4%		1/3		3			5	3	6/2	6	as above - broken rock in joint at 278.4
47	279.42	280.63	1.21	1.2	99.2%	1.01	83.5%		3/4		5			5	1/3	6/2	6	mudstone/siltstone
47/48	280.63	282.46	1.83	1.78	97.3%	1.57	85.8%		3/4		6			5	1/3	6/2	6	mudstone/siltstone
48	282.46	283.07	0.61	0.52	85.2%	0.38	62.3%		3/4		2			5	1/3	6/2	6	as above - 50%/50% alternating layers, highly fractured top 30 cm
48	283.07	283.68	0.61	0.65	106.6%	0.2	32.8%		2/3		2			4	1/3	6/2	6	as above - highly fractured

Knight Piésold
CONSULTING

GEOTECHNICAL DRILLHOLE LOGGING DATA SHEET
(NON-ORIENTED DRILLCORE)

Project: Location:	Kemess 10312.043 N 10165.227 E	Logged by	Ma/Lam/Lapeare	Date	Oct. 30, 2000	Hole No. Hole Dia.	2000-6	Azimuth Inclination	045 -65
Sheet	7								

Intact Rock Hardness

Hardness	Estimated UCS, MPa	Description	Field Performance
0	0.25 - 1.0	Extremely weak rock	Indented by thumbnail
1	1.0 - 5.0	Very weak rock	Crumbles under firm blows with the point of a geological pick; can be peeled with a pocket knife
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Joint Condition

PERSISTENCE	< 1 m	1 - 3m	3 - 10m	10 - 20 m	> 20m
Rating	6	4	2	1	0
APERTURE	None	< 0.1 mm	0.1 - 1.0	1 - 5	5 - 10
Rating	6	5	4	1	0
ROUGHNESS	V Rough	Rough	SL Rough	Smooth	Slicks
Rating	6	5	3	1	0
INFILLING	None	Hard Infilling		Soft Infilling	
		< 5 mm	> 5 mm	< 5mm	> 5 mm
Rating	6	4	3	2	0
WEATHERING	Unweathered	SW	MW	HW	Decomposed
Rating	6	5	3	1	0

Joint Weathering

Rating	Description
0	Completely weathered - original fabric and relict structures remain but, rock is decomposed and friable
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6	Fresh and Unweathered

Joint Roughness

Rating	Description
0	Polished or Slickensided
1	Smooth, Planar
3	Slightly Rough, Undulating
5	Rough Undulating/Stepped
6	Very Rough, Stepped

BOX	INTERVAL (ft)			RECOVERY		RQD		LONG	HARD	PLST	No.	PLST	JOINT CONDITION					Geological Description
	FROM	TO	LENGTH	ft	%	ft	%	ft		UCS	Joints	Depth	PERSIS	APER	ROUGH	INFILL	WTHR	(Rock Type, Colour, Texture, Alteration, Structure)
48	283.68	285.51	1.83	1.7	92.9%	0.75	41.0%		3/4		5			5	3/1	6/2	6	as above - at 284.45: disseminated epidote alteration (yellowish and greenish)
48/49	285.51	288.25	2.74	2.87	104.7%	1.8	65.7%		3/4		8			4	3	6/2	6	as above - chlorite altered from 285.9
49	288.25	291.3	3.05	3.03	99.3%	2.67	87.5%		4		8			5	3	6/4	6	as above - trace pyrite locally along core
49/50	291.3	292.82	1.52	1.74	114.5%	1.36	89.5%		3/4		5			5	3	6	6	plag - elongated crystals - dyke
50	292.82	294.35	1.53	1	65.4%	0.55	35.9%		3		3			5	3	6/2	6	as above
50	294.35	297.39	3.04	3.07	101.0%	2.49	81.9%		3/4		9			5	3	2	6	as above
50/51	297.39	300.44	3.05	3.05	100.0%	2.94	96.4%		4		7			5	3	6	6	plag crystals up to 297.53 - rest Takla sediments
51	300.44	303.49	3.05	3.1	101.6%	2.5	82.0%		4		6			5	2/3	6/2	6	Takla sediments - highly fractured zone (1-2mm Ch) and 302.5-302.9
51/52	303.49	306.53	3.04	3.08	101.3%	2.26	74.3%		3/4		2			4	3	6/2	6	mafic dyke to 306.07 - mudstone/siltstone to end of run
52	306.53	308.36	1.83	1.67	91.3%	1.23	67.2%		3/4		4			4	3	6	6	interbedded siltstone/mudstone - chlorite alteration on fy's
52	308.36	309.58	1.22	1.38	113.1%	0.94	77.0%		3/4		3			4	3/1	6	6	siltstone/mudstone to 308.64 - andesitic/dacitic dyke to end of run
53	309.58	310.5	0.92	0.95	103.3%	0.36	39.1%		4/5		7			4	3/1	6	6	andestitic/dacitic dyke - hard, siliceous, massive, chlorite, fine grained
53	310.5	312.32	1.82	1.53	84.1%	1.05	57.7%		4/5		4			4	3/1	6	6	as above
53	312.32	313.54	1.22	1.37	112.3%	0.63	51.6%		4/5		5			4	3/1	6	6	as above
53	313.54	314.46	0.92	0.7	76.1%	0	0.0%		4/5		5			4	3/1	6	6	as above
																		EOH

KEMESS CENTRE DRILL HOLE ASSAY RESULTS FOR KC-2000-06

Hole_ID	Sam_ID	from	to	interval	% Cu	gAu/t
2000-06	14766	40.06	40.76	0.70	0.005	0.03
2000-06	14767	59.04	59.95	0.91	0.004	0.04
2000-06	14768	62.64	64.12	1.48	0.005	0.05
2000-06	14769	82.74	84.08	1.34	0.008	0.06
2000-06	14770	121.30	124.30	3.00	0.014	0.05
2000-06	14771	124.30	126.30	2.00	0.008	0.06
2000-06	14772	126.30	128.30	2.00	0.014	0.05
2000-06	14773	128.30	130.30	2.00	0.263	0.09
2000-06	14774	130.30	132.30	2.00	0.147	0.04
2000-06	14775	132.30	134.30	2.00	0.044	0.02
2000-06	14776	134.30	136.30	2.00	0.086	0.02
2000-06	14777	136.30	138.30	2.00	0.029	0.02
2000-06	14778	138.30	139.60	1.30	0.323	0.03
2000-06	14779	139.60	141.30	1.70	0.049	0.67
2000-06	14780	141.30	143.00	1.70	0.085	1.87
2000-06	14781	143.00	145.00	2.00	0.840	1.80
2000-06	14782	145.00	147.00	2.00	0.263	0.92
2000-06	14783	147.00	149.00	2.00	0.340	1.01
2000-06	14784	149.00	151.00	2.00	0.247	0.32
2000-06	14785	151.00	153.00	2.00	0.057	0.06
2000-06	14786	153.00	155.00	2.00	0.318	0.87
2000-06	14787	155.00	157.00	2.00	0.430	1.82
2000-06	14788	157.00	159.00	2.00	0.210	0.72
2000-06	14789	159.00	161.00	2.00	0.246	0.92
2000-06	14790	161.00	163.00	2.00	0.220	0.86
2000-06	14791	163.00	165.00	2.00	0.289	1.23
2000-06	14792	165.00	167.00	2.00	0.298	1.67
2000-06	14793	167.00	169.00	2.00	0.330	1.36
2000-06	14794	169.00	171.00	2.00	0.430	1.83
2000-06	14795	171.00	173.00	2.00	0.440	1.59
2000-06	14796	173.00	175.00	2.00	0.304	1.27
2000-06	14797	175.00	177.00	2.00	0.282	0.87
2000-06	14798	177.00	179.00	2.00	0.255	0.87
2000-06	14799	179.00	181.00	2.00	0.255	0.94
2000-06	14800	181.00	183.00	2.00	0.296	0.97
2000-06	14801	183.00	185.00	2.00	0.294	1.14
2000-06	14802	185.00	187.00	2.00	0.309	1.08
2000-06	14803	187.00	189.00	2.00	0.380	1.50
2000-06	14804	189.00	191.00	2.00	0.302	1.10
2000-06	14805	191.00	193.00	2.00	0.247	0.71
2000-06	14806	193.00	195.00	2.00	0.280	0.80
2000-06	14807	195.00	197.00	2.00	0.252	0.71
2000-06	14808	197.00	199.00	2.00	0.210	0.66
2000-06	14809	199.00	201.00	2.00	0.266	0.85
2000-06	14810	201.00	203.00	2.00	0.215	0.89
2000-06	14811	203.00	205.00	2.00	0.213	0.80
2000-06	14812	205.00	207.35	2.35	0.269	0.88

KEMESS MINE

Pit Samples Assay Certificate

Certificate: 000107a3

Date: Jan.7/01 **Assayer:** CT/CJ

	Sample No	(D)uplicate	Cu %	Sulphur	MPA	Au	Au
		(S)tandard	%	%		ppm	oz/ton
1	14786		0.318			0.87	0.025
2	14787		0.430			1.82	0.053
3	14788		0.210			0.72	0.021
4	14789		0.246			0.92	0.027
5	14790		0.220			0.86	0.025
6	14791		0.289			1.23	0.036
7	14792		0.298			1.67	0.049
8	14793		0.330			1.36	0.040
9	14794		0.430			1.83	0.053
10	14795		0.440			1.59	0.046
11	14798		0.255			0.87	0.025
12	14799		0.255			0.94	0.027
13	14799	D	0.253			0.92	0.027
14	PM-170	S				1.24	0.036
15	Blank	S				0.01	0.000
16	RTS-1	S	0.059				
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							

14	15
TOTAL ASSAYS SHEET =	29

KEMESS MINE

Pit Samples Assay Certificate

Certificate: 010107a4

Date: Jan.7/01 **Assayer:** CT/CJ

	Sample No	(D)uplicate	Cu %	Sulphur	MPA	Au	Au
		(S)tandard	%	%		ppm	oz/ton
1	14801		0.294			1.14	0.033
2	14803		0.380			1.50	0.044
3	14804		0.302			1.10	0.032
4	14805		0.247			0.71	0.021
5	14806		0.280			0.80	0.023
6	14807		0.252			0.71	0.021
7	14808		0.210			0.66	0.019
8	14809		0.266			0.85	0.025
9	14810		0.215			0.89	0.026
10	14811		0.213			0.80	0.023
11	14812		0.269			0.88	0.026
12	14812	D	0.270			0.90	0.026
13	GTS-2	S				0.27	0.008
14	Blank	S				0.00	0.000
15	RTS-3	S	0.283				
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							

13	14
TOTAL ASSAYS SHEET =	27

KEMESS MINE

Pit Samples Assay Certificate

Certificate: 010108a2

Date: Jan.8/01 Assayer: Jm/MF

	Sample No	(D)uplicate	Cu %	Sulphur	MPA	Au	Au
		(S)tandard	%	%		ppm	oz/ton
1	14766		0.005			0.03	0.001
2	14767		0.004			0.04	0.001
3	14768		0.005			0.05	0.001
4	14769		0.008			0.06	0.002
5	14770		0.014			0.05	0.001
6	14771		0.008			0.06	0.002
7	14772		0.014			0.05	0.001
8	14773		0.263			0.09	0.003
9	14774		0.147			0.04	0.001
10	14775		0.044			0.02	0.001
11	14776		0.086			0.02	0.001
12	14777		0.029			0.02	0.001
13	14778		0.323			0.03	0.001
14	14779		0.049			0.67	0.020
15	14780		0.085			1.87	0.055
16	14781		0.840			1.80	0.052
17	14782		0.263			0.92	0.027
18	14783		0.340			1.01	0.029
19	14784		0.247			0.32	0.009
20	14785		0.057			0.06	0.002
21	14775	D	0.044			0.03	0.001
22	14785	D	0.056			0.07	0.002
23	PM-170	S				1.21	0.035
24	RTS-1	S	0.059				
25	BLANK	S				0.01	0.000
26							
27							

23	24
TOTAL ASSAYS SHEET =	47

KEMESS MINE

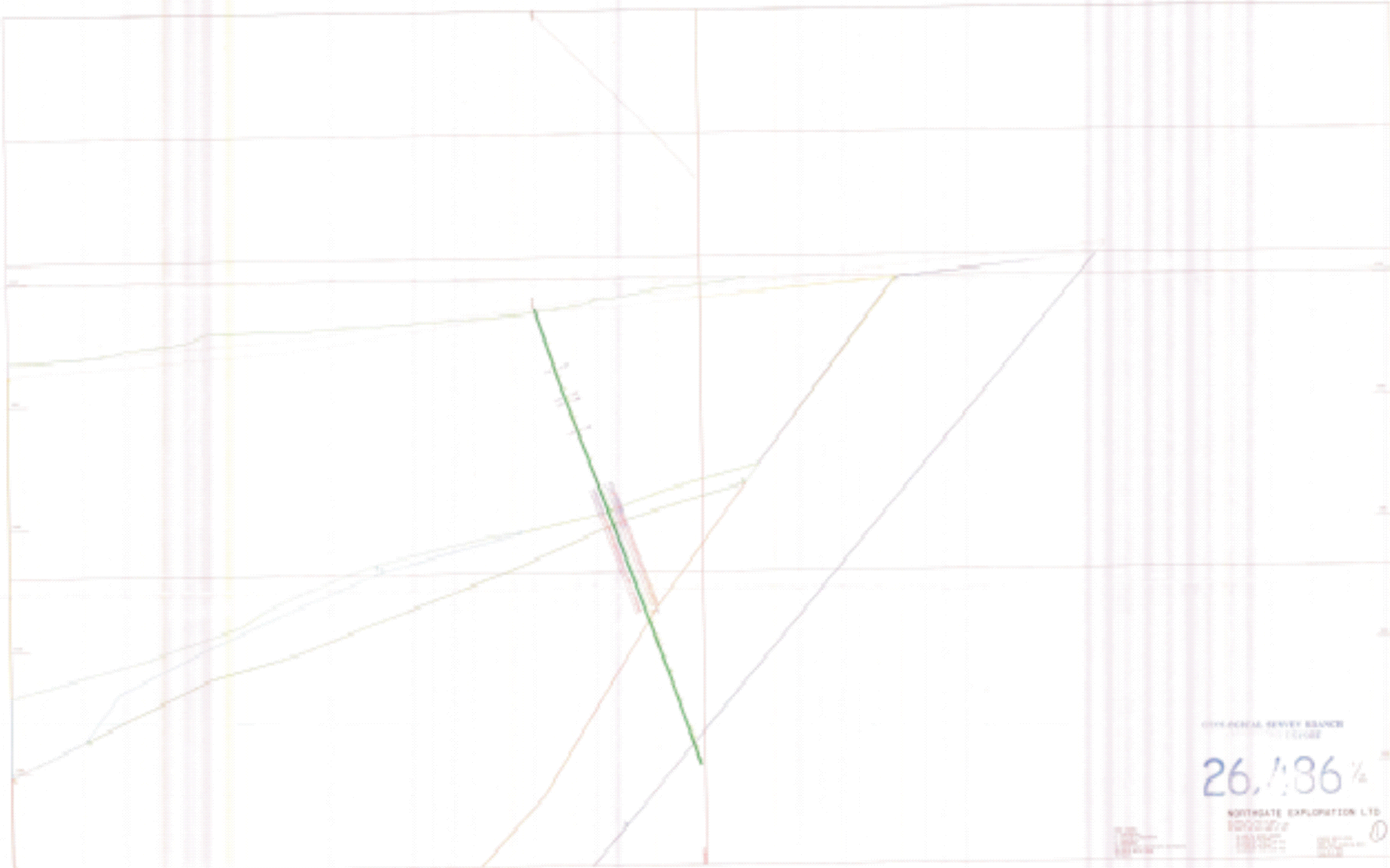
Pit Samples Assay Certificate

Certificate: 010108a3

Date: Jan.8/01 Assayer: Jm/CT

	Sample No	(D)uplicate	Cu %	Sulphur	MPA	Au	Au
		(S)tandard	%	%		ppm	oz/ton
1	14796		0.304			1.27	0.037
2	14797		0.282			0.87	0.025
3	14800		0.296			0.97	0.028
4	14802		0.309			1.08	0.031
5	14802	D	0.315			1.01	0.029
6	GTS-2	S				0.24	0.007
7	BLANK	S				0.00	0.000
8	RTS-3	S	0.282				
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							

6	7
TOTAL ASSAYS SHEET =	13


NORTHGATE EXPLORATION LTD