



KENNECOTT CANADA EXPLORATION INC.
LEGEND JV DIAMOND DRILL LOGS



Drill Hole:	98DH-PE01	Azimuth:	N/A
Easting:	374 692 m E (NAD 27)	Dip:	-90 ⁰ to -870 at EOH
Northing:	6 368 251 m N (Z 12)	Depth (EOH):	200.3m (EOH)
Collar Elevation:	~ 710 m amsl (GPS)	Diameter(s):	NQ
Grid Location:	1025 E, 5050 N	Geologist:	Richard Beck
Drill Contractor:	Aggressive Drilling	Geotech/Sampier:	Floyd Thompson
Contracted to:	Kennecott Canada	Project Geologist:	Theo Aravanis
Drill Type:	Boyles 25A	Date Collared:	09 November, 1998
Drill Foreman:	Mitch McLelland	Date Completed:	13 November, 1998

Summary Information

Drill-hole 98DH-PE01 is the initial hole drilled on the Kennecott / Montello Resources Legend Joint Venture target (Pegasus) in northeast Alberta. The hole is sited to test an airborne geophysical target (Magnetic) recognized as a potential kimberlite. The hole intersected kimberlite beneath - 80m of till sediment cover, and constitutes the discovery hole for the **Pegasus Kimberlite**.

PVC pipe was placed in the hole from surface to 154 metres.

NQ core recovered mudstone and autolithic kimberlite. The core has been split: half core has been sampled for detection of diamonds (by caustic fusion at Kennecott's micro-diamond facility in Thunder Bay, ON.) Samples have also been taken for indicator HM recovery / EPMA mineral chemistry, petrographic examination, geochronology and palynology (refer end of log). Visual logging has not identified any P or E -type indicator minerals / xenoliths (except olivine).

The kimberlite as logged appears to have few HM kimberlitic indicators. Magnetism thought to be a result of locally prolific serpentine + magnetite alteration of the: some (particularly the smaller) olivine grains in more magnetic intervals appear to be mantled by a black magnetite-bearing alteration rim.

Summary Log

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Detailed Log

0.0 - 82.91 m**Cased Overburden**

Drill timesheets indicate gravel beds and boulder tills were encountered throughout tricone drilling to set the casing. A two-metre gravel bed and sand and clay were also intersected.

82.91 - 86.56 m**Ochreous relic kimberlite**

Reddish yellow to light grey friable matrix supported kimberlite. The unit of rock exhibits slight gradational, coarse to fine, bedding with fragments of country rock xenoliths (CRX's), primarily shale's (inferred) and mud rock. The rock is rich in matrix carbonate with infrequent veined carbonate and abundant medium grained relic olivines and phlogopite. Ochreous Fe - staining is widely developed throughout entire interval, concentrating heavily along fracture planes.

82.91 - 84.80m	Yellow coarsely fragmental, olivine rich kimberlite with frequent fragments (sub-rounded shales? and sub-angular muds).
84.80 - 84.90m	Medium grey mudstone with minor mix of kimberlite and major carbonate veining
84.90 - 86.56m	Yellow coarsely fragmental matrix supported kimberlite. Mildly bedded friable kimberlite with abundant altered olivines and Fe stained coarse xenoliths.

86..56 - 90.10m**Massive Black Mudstone**

This interval starts with a sharp contact between the overlying kimberlite and ends with a slightly gradational contact, yet still fairly distinct. The entire length is a black friable mudstone with minor local sections (86.9m and 87.2m) of relic kimberlite (inferred based on textural appearance).

90.10 - 99.50 m**Coarse grained Kimberlite**

This interval is comprised of large relic olivine crystals set in a medium grained serpentinized matrix. The rock is dark to light grey, competent hard with frequent rubble zones. Iron staining is abundant throughout the interval, concentrating along fracture surfaces and as haloes to mud xenoliths (infrequent), and as a simple alteration feature. On average, the weathered alteration diminishes with depth. Xenoliths of green marls (shales?) and mud rock are present, but not abundant. Xenoliths are for the majority sub-angular.

90.10 - 91.00m	Ochreous coloured kimberlite with abundant large relic olivines, few sub-angular mud xenoliths and heavy Fe-staining. The fine grained matrix is strongly replaced with carbonate.
91.00 - 91.90m	Rubble zone
91.90 - 92.50m	Light grey, Fe-stained competent kimberlite. Large crystals of relic olivine (4-6mm). Veined carbonate present. Local section at 92.4m has large 2cm autoliths made up of a fine-grained grey matrix and numerous small relic olivines.
92.50 - 92.90m	Rubble zone
92.90 - 94.30m	This interval is the same as the 91.9 - 92.5m interval, but is lacking the large abundant olivines.
94.30 - 95.20m	Rubble zone
95.20 - 96.10m	Broken zone
96.10 - 97.00m	Rubble zone with few competent kimberlite fragments similar to previously mentioned kimberlite.
97.00 - 98.60m	Coarse "lapilli" form, broken zone of moderately competent kimberlite. Larger mud xenoliths (sub-angular and unaltered) exist throughout this unit with fine-grained olivine and phlogopite in abundance. Carbonate replacement has left behind a "porous" texture to the kimberlite.
98.60 - 99.50m	Broken zone of light grey hard kimberlite. A Carbonate matrix hosting fine-grained olivine and large (3mm) phlogopite. Angular mud xenoliths (larger than adjacent units) with clean sharp contacts are observed.

99.5 - 102.7m**Medium grained kimberlite**

This smaller unit is a medium grey, predominantly competent, olivine rich kimberlite, with local broken zones. The competent kimberlite is host medium grained, abundant relic olivine set in a dominantly aphanitic mudstone matrix with frequent medium fragmental, angular mud rock xenoliths. Infrequent, but observed, is chloritization of few xenoliths. Minor phlogopite is observed as is traces of carbonate in the matrix (acid test).

99.50-101.0m	Dark grey medium grained kimberlite with numerous relic olivine. Sub-angular fragments of mud supported by a carbonate influenced matrix.
101.0 - 102.7m	A broken zone of competent hard dark grey kimberlite

102.7 - 104.0m**Brown kimberlitic mud rock**

Brown to light grey kimberlitic mud rock. The competent sections are light grey, medium fragmental with relic, carbonate replaced, olivine, supported in a fine-grained matrix. The fragments are of previously noted xenoliths and appear to be unaffected by mixture of mud and carbonate. The top of the unit is a sharp contact mud rock with the end of the unit more diffused (104.0 - 104.3m) and exhibits minor chloritization (light bluish green) through mud sections. Carbonate veining is observed only at contacts with adjacent units.

102.7 - 102.9m

Dark brown mud rock with abundant veined carbonate

102.9 - 104.0m

Brown kimberlitic mud rock with few fragments. Carbonate replacement throughout matrix.

103.2m

Light grey competent piece of medium grained relic kimberlite. This hard rock section is devoid of abundant mixed mud rock and its appearance is texturally similar to that of the adjacent units, suggesting that the mud dominant unit is an injected seam.

104.0 - 124.0m**Fine-grained fragmental Kimberlite**

This unit is similar in appearance to that of the 99.5 - 102.7m interval, however, the frequency of CRX's differentiates the two units. The kimberlite is a dark grey to green serpentinized olivine rich rock. The olivines are large in size (2 - 6mm) with an ochreous Fe-stained colour. Their abundance exists at the top and bottom of the interval, but remain numerous (fine-grained in matrix) throughout. Country rock xenoliths are few in this unit and those observed are of large size (1 - 4cm). Minor veined carbonate throughout entire unit, yet are hosts to pyrite crystals and thin veneers of chalcopyrite in local sections. Fibrous radiating pyrite is seen in carbonate replaced olivine macrocrysts.

104.3 - 109.7m

Dark grey/green competent stiff kimberlite with dominant large olivine crystals. Olivine is replaced with carbonate and chloritization has occurred in local crystals. Black, angular and sub-angular, fragments are dominant in this interval.

106.15m	Light brown, fine-grained kimberlite autolith (5cm) with a sub rounded aphanitic matrix is observed. Minor carbonate in matrix, however, fresh olivine throughout. No micas recognized.
108.1 m	A similar kimberlitic autolith is seen, but much smaller (6mm) with fresh phlogopite recognized in matrix.
109.7- 122.1 m	Dark grey/green, competent hard kimberlite with a mud rich matrix and numerous olivine grains (2 - 3mm). The dark colour associated with the unit and the presence of intercalated muds suggest a strong mixture in this unit of kimberlite. Mud xenoliths exist in local sections, but appear scarce (notable black, angular mud clast at 122.0m). Veined carbonate and chalcopyrite exist locally. Unit appears devoid of micas.
122.1 - 124.0m	Medium grey/green olivine (relic) rich kimberlite diffusing into the underlying unit (123.2 - 124.0m). Fragments are, again, infrequent light grey mud clasts (angular). Olivine remains abundant and the ochreous colour has been replaced with a white/grey, carbonate rich, colour. Texturally it is the same as the overlying unit. Numerous carbonate veins close out the interval.
124.0 - 126.2m	Black mudstone This interval of black mudstone is similar to that of the 86.56 -90.1m interval, but this predominantly rubble unit houses a few grey relic kimberlite fragments and pyrite crystals are numerous throughout its aphanitic matrix.
126.2 -134.3m	Coarse autolithic kimberlite Light grey/green, coarse fragmental, lapilli rich kimberlite. Major components are as for previous intervals. The entire unit is "packed" with lapilli form autoliths ranging from 4 to 10mm in size. These matrix supported lapilli have a fine-grained brown to grey matrix hosting fine grained relic and fresh olivine and a black (mafic?) mineral. Fragmental component size and packing density is high with the kimberlite having a minor carbonate and mud matrix; - the matrix has eroded in local sections leaving the autolithic lapilli as raised features. Autolithic lapilli are generally dark grey and rounded with an aphanitic dark matrix. Numerous rounded mud clasts are observed, ranging from 5 - 40mm in size and consist of numerous relic olivines. Again, no micas were observed whilst logging.
126.2 - 127.9m	Light grey/green competent autolith rich core. Carbonate replacement of a few lapilli forms. Minor carbonate in matrix

(acid test). Veined carbonate rich mud seams at 127.2m and 127.7 - 127.9m.

127.9 - 131.7m This unit is light to dark grey, autolith and mud clast rich. Local broken sections exist, yet most of the core is competent hard with a mud rich matrix. Autolithic lapilli are well rounded with a dark fine grained matrix and fine grained relic olivines. The mud clasts are much larger and also well rounded. Minor carbonate in matrix throughout.

131.7 - 134.3m Light olive green competent hard whole core with fine-grained abundant relic olivine in matrix. Mud and marl xenoliths (sub angular) become dominant in this section. Local colours vary from black to grey to green. Local sections of light green alteration suggest chloritization. Competent pieces look similar to that of the 99.5 - 102.7m interval.

134.3 - 144.8m

Black relic kimberlite mud rock breccia

Light brown to black kimberlitic mud rock breccia. Mud is abundant throughout the unit with numerous kimberlite portions. The rock is rich in mud (visually 70%) and 30% grey coarse fragmental kimberlite. Lapilli forms exist with abundant relic olivine.

Carbonate has replaced almost the entire kimberlitic sections with olivine crystals devoid of material, leaving behind white-coated depressions.

134.3 - 135.0m Well mixed black to dark grey, carbonate veined breccia with numerous lapilli form fragments.

135.0 - 137.0m Light to dark grey mud rock breccia. Hard kimberlitic core shows clean, sharp contact with black mud rock units. Few black mud xenoliths are observed in a relic olivine rich matrix.

137.0 - 141.0m Predominantly black kimberlitic mud rock breccia with light grey carbonate replaced whole core pieces. Medium grained olivines are completely replaced with carbonate and in turn are white grains set in a black matrix.

141.0 - 144.8m Black mud rock with medium fragmental, densely packed lapilli rich kimberlite zones. Kimberlite is mixed throughout the interval, however, at a 20% to 80% mud ratio. Lapilli are medium grained with relic olivine supported in an aphanitic matrix.

144.8 -160.1m

Grey and black massive mud rocks

Undisturbed intervals of light grey to black, Cretaceous? mudstone with laminations. The upper portion of the unit appears silty yet becoming more mud/clay rich with depth. Desiccation fractures are dominant throughout the entire interval.

Broken zones are infrequent and observed at 151.5m, 156.8 - 157.0m, and 159.4 - 159.8m.

Kimberlite fragments exist in this unit of core, resembling the kimberlite noted at the interval 141.0 - 144.8m. Fragments observed at 145.9m, 153.9 - 154.0m, 154.3 - 154.4m, 155.4m, and 156.3 - 156.4m.

160.1 - 189.6m

Fine grained autolithic kimberlite

Dark grey, competent hard, fine-grained kimberlite. Abundant autolithic lapilli forms dominate this unit supported by an olivine rich dark matrix. Fragments are few, yet most notably they are sub-angular black mud CRX's in local sections. Fresh macrocrysts of olivine are abundant in the upper portion of the unit grading to a fine-grained matrix dominated presence towards the end of the interval. Numerous carbonate veins and quartz veins are prolific throughout. Minor carbonate in matrix with medium grained calcite crystals. Chalcopyrite is abundant on fracture planes as a thin veneer whilst pyrite is dominant as crystals within the veined intrusions.

Autolithic lapilli forms are sub-rounded and of a fine-grained matrix comprising relic olivine and minor carbonate (calcite crystals are present, however, this is suggestive of a secondary phase, as the whole core is dominant with calcite in the matrix). The lapilli forms are generally lighter grey to light brown.

160.1 - 160.2m Light grey, carbonate replaced relic kimberlite. This unit of kimberlite is unlike any other kimberlitic unit, as it is medium to coarse fragmental, moderately competent with altered CRX's and major veining of both quartz and carbonate. The unit resembles that of mud dominated fault breccia.

160.2 - 160.6m Strongly carbonate veined black mud rocks.

160.6 - 164.5m Light grey, fine grained fragmental kimberlite . Fragments are infrequent, black, sub-angular mud rocks with calcareous rims, and to a lesser degree, sub-angular green argillites. This unit is dominated by quartz veins (a single qtz vein, 7mm wide, intersects ~1.5m of core with well defined prismatic crystals along broken sections; - this length of veining is broken apart by an in fill of light grey mud). Chalcopyrite and pyrite are observed along fractures and within the veins themselves. The kimberlite matrix is fine-grained black with fresh and relic olivine.

164.5 - 174.9m	Medium fragmental dark grey autolithic kimberlite. The rock is competent hard with abundant fresh and relic olivine macrocrysts. Autoliths are dominantly sub-rounded, brown with relic olivine in a fine-grained matrix.
174.9 - 189.6m	This interval is the same as the aforementioned interval, distinguished only by fewer fragments and the recurrence of quartz and carbonate veining.
189.6 -194.8m	Light grey relic kimberlite
	Light grey competent hard kimberlite. Abundant macrocrysts of relic olivine with a carbonate replaced. Entire unit displays autolithic lapilli, but of a lesser degree than the overlying unit. The rock is carbonate rich showing signs of chloritization in local mud rock sections. The majority of the interval is broken with few whole core pieces. Intercalated mud rocks and sharp clean contacts suggest injection of mud rock. Fragments of CRX's include light grey, sub-angular mud rock and angular black mud.
189.6 - 190.8m	Broken zone of grey kimberlite and light brown mud rock
190.8 - 192.3m	Broken zone of mud rock with few kimberlitic fragments. Chloritization present at 191.0m.
192.3 - 193.5m	Competent whole core of relic kimberlite with autolithic lapilli (altered and fine-grained).
193.5 - 194.2m	Broken zone of mud rock
194.2 - 194.8m	Identical to 192.3 - 193.5m interval.
194.8 - 200.3m	Light brown mud rock
	Throughout this mud rock interval, medium (2 - 4mm) Fe-stained pyrite crystals are observed. Mud rock is dominantly competent with local friable sections.
	A notable, reworked, autolithic relic kimberlite fragment is present between 196.9 - 197.1 m. Entire 2cm fragment is rich in autoliths, pyrite crystals and mud rock. The autoliths are completely replaced, thus a secondary phase of reworked mud rock.
200.3m	E.O.H.

Representative Samples

#	Depth in Hole	Geological Unit	#	Depth in Hole	Geological Unit
1	84.3m	Ochreous relic kimberlite	13	144.8m	Grey and Black massive mud rocks
2	88.2m	Massive black kimberlite	14	160.2m	Fine grained autolithitic kimberlite
3	92.3m	Coarse grained kimberlite	15	162.2m	Fine grained autolithitic kimberlite
4	97.9m	Coarse grained kimberlite	16	165.3m	Fine grained autolithitic kimberlite
5	100.7m	Medium grained kimberlite	17	173.1 m	Fine grained autolithitic kimberlite
6	103.2m	Brown kimberlitic mud rock	18	174.0m	Fine grained autolithitic kimberlite
7	104.2m	Fine grained fragmental kimberlite	19	180.3m	Fine grained autolithitic kimberlite
8	109.8m	Fine grained fragmental kimberlite	20	186.7m	Fine grained autolithitic kimberlite
9	118.1 m	Fine grained fragmental kimberlite	21	188.4m	Fine grained autolithitic kimberlite
10	124.9m	Black mudstone	22	193.0m	Light grey relic kimberlite
11	133.6m	Coarse autolithitic kimberlite	23	197.0m	Light brown mud rock
12	141.0m	Black relic kim. Mud rock Rx	24	200.0m	Light brown mud rock

Petrology Samples**Petrographic Samples**

Sample No.	Depth	Sampled by	Submitted to
VR31093A	174.8m	Richard Beck	
VR31096A	106.2m	Richard Beck	

Palynology Samples

Sample No.	Depth	Sampled by	Submitted to
VR31094A	128.3M	Richard Beck	

Heavy Mineral / Micro-diamond Sample List

Sample No.	From (m)	To (m)	Interval (m)	Mass (kg)	Shipped
VR87876	82.91	87.0	4.09	5	Nov. 19,1998
VR87877	HM	COMP.	-	15	Nov. 19,1998
VR87882	90.2	95.65	5.45	10	Nov. 19,1998
VR87883	95.65	102.9	7.25	10	Nov. 19,1998
VR87884	102.9	108.3	5.4	10	Nov. 19,1998
VR87885	108.3	114.7	6.4	10	Nov. 19,1998
VR87886	114.7	122.5	7.8		
VR87887	122.5	124.3	1.8	10	Nov. 19,1998
	125.7	132.1	6.4	10	Nov. 19,1998
VR87888	HM	COMP.	-	15	Nov. 19,1998
VR87889	132.1	139.1	7.0	10	Nov. 19,1998
VR87890	139.1	160.1	6.3		
	160.1	161.4	1.3	10	Nov. 19,1998