52J07NW0007 17 ARMIT LAKE

010

DIAMOND D...

AREA: ARMIT LAKE

REPORT NO: 17

WORK PERFORMED FOR: Northern Dynasty Exploration Ltd.

RECORDED HOLDER: SAME AS ABOVE (xx)

: OTHER

CLAIM NO.	HOLE NO.	FOOTAGE	DATE	NOTE
Pa914056	K-89-01	439'	Sept/89	(1)
Pa912888	K-89-02	439'	Sept/89	(1)
Pa903332	K-89-03	599'	Sept/89	(1)
Pa903333	K-89-04	639'	Sept/89	(1)
Pa912887	K-89-05	866'	Sept/89	(1)

NOTES: (1) #W8903.152, filed Nov/89

Diamond Drill Record

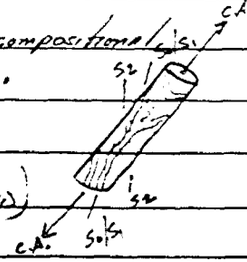
COLLAR:	
NORTH	2+00 S
EAST	L22+57 E
ELEVATION	
LOGGED BY	D. ELSBY
DATE LOGGED	
MAP REFERENCE NO.	

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
COLLAR		-60°
199.57/60.6		
319'/97.2		-58°
439/133.8		-56°
METHOD: Acid Etch		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashabowie) Lake / Seymour Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME Pa 914056
COMMENCED 03 SEPT '89
FINISHED 06 SEPT '89
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb
0.0	4.5		CASING / OVERBURDEN					
4.5	16.0		GRUNERITE - CARBONATE - METACHERT	4.5	7.4		80001	1
			Light-green-grey compositionally banded metachert containing	7.4	10.4		80002	4
			up to 50% ≤ 2cm well defined and wispy tan-brown grunerite-	10.4	13.2		80003	1
			carbonate layers. These layers are complexly folded in random sections	13.2	14.9		80004	1
			throughout and show an anastomosing "net-work" texture. Minor sections	14.9	16.0		80005	17
			(≤1%) intercalated chlorite with grunerite-carbonate bands. Some					
			grunerite bands are more typical yellow-green and contain little or					
			no carbonate. Little or no sulphide mineralization in this section.					
			Calcareous (carbonate) and generally non-magnetic throughout.					
			Foliation / compositional layering highly variable from 0° to 30° to c.a.					
			Note: Two foliations visible ~ one (S_1) subparallel to compositional					
			layering, and a second (S_2) which cross cuts S_1 @ 14°					
			- consistent throughout unit					
			Downhole contact sharp @ 10° to c.a. (& mineralized)					
			BROKEN-CORE: SEAM @ 11.9m – 12.2m					



RECEIVED
OCT 27 1989
PATRICIA MINING DIVISION

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamah) Lake / Sawant Lake area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
4.5	16.0		CONT'D					
			Alteration: Grunerite (Iron-Amphibole): approximately 35% as light yellow-green and tan-brown ≤ 2cm well defined and wispy anastomosing layers mostly intercalated with carbonate disseminations and wisps ~ often difficult to distinguish grunerite from carbonate - probable metamorphic derivative of magnetite (?)					
			Carbonate (calcite): approximately 15 to 20% as tan to pink tan disseminations within grunerite bands and to a lesser degree as random disseminations and fracture-fillings in metachert					
			Mineralization: Pyrite: <<1% as clots and disseminations in fractures and along random compositional layers throughout. Some minor associated hematite as small wisps and disseminations.					

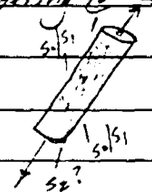
Diamond Drill Record

COLLAR:	
NORTH	
EAST	
ELEVATION	
LOGGED BY	
DATE LOGGED	
MAP REFERENCE NO.	

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kasn (Kashaneogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
16.0	17.3		Biotite-Chlorite-Schist	16.0	17.3		80006	2
			Dark grey-green to black homogeneous well foliated biotite-chlorite-schist containing 1 to 3% white-carbonate disseminations.					
			Locally calcareous and non-magnetic					
			Foliation: two cleavages visible: dominant ~primary which appears subparallel to compositional layering @ 45° to c.a. and a secondary cleavage @ 25° to c.a.					
								
			Downhole contact is wispy and somewhat diffuse @ 35° to c.a.					
			Alteration: Carbonate: ≤ 3% white calcite veinlets and disseminated masses oriented subparallel to main foliation/compositional layering -					
			Mineralization: Pyrite: trace as clots and cubes adjacent to both up-hole / down-hole contacts -					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME: NORTHERN DYNASTY EXPLORATIONS Ltd.
PROPERTY NAME: KASH (KASHAMEQUAN) LAKE / SIMONT LAKE AREA
DRILLING CONTRACTOR: LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER: ACME ANALYTICAL LABORATORIES LTD.
PURPOSE OF HOLE:

HOLE NO. K-89-01
CLAIM NAME:
COMMENCED:
FINISHED:
PROJECT NO.:

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb
17.3	60.7		GRUNERITE - CARBONATE - METACHERT / grunerite - METACHERT	17.3	20.0		80007	4
			Similar to 4.5-16.0m except unit becomes increasingly siliceous	20.0	22.1		80008	1
			and variably hematitic downhole while carbonate alteration	22.1	24.7		80009	1
			gradually decreases.	24.7	27.3		80010	3
			Calcareous (17.3-22.1) and locally thereafter and generally non-	27.3	30.0		80011	3
			magnetic	30.0	32.6		80012	2
			Foliation is variable from 20° uphole changing gradually to 40° downhole	32.6	34.4		80013	1
			Downhole contact gradational over 10 cm @ 30° to C.A.	34.4	36.0		80014	2
				36.0	38.0		80015	1
			22.1-24.4: FAULT / SHEAR ZONE: BROKEN, SHEARED AND hematite-limonite	38.0	40.9		80016	2
			stained - core; hematite-limonite - alteration / OXIDATION IS PERVASIVE	40.9	43.9		80017	7
			throughout section, concentrated mainly in iron-amphibole layers.	43.9	46.7		80018	29
			52.7-55.0: FAULT / SHEAR ZONE: BROKEN SHEARED core which has been	46.7	47.6		80019	35
			thoroughly oxidized ~ almost an OXIDE "SINTER" ~ OXIDATION / hydrothermal	47.6	50.1		80020	5
			alteration has produced 70-80% hematite-limonite throughout section	50.1	52.7		80021	4
			48.8-52.7: highly silicified section with up to 75% dark-grey-black siliceous	52.7	53.9		80022	6
			material containing 10 to 15% grunerite bands and 10% light grey metachert	53.9	55.0		80023	7
			46.9-47.6: Grunerite ~ 90% containing 10% ≤ 5m dark grey metachert clasts	55.0	56.3		80024	2
				56.3	58.0		80025	5

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS Ltd.
PROPERTY NAME KASH (KASHAWEOGAMA) LAKE / SIMONT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	Au ppb	ASSAYS
17.3	60.7		CONT'D	58.0	60.7		80026	6	
			Alteration:						
			Grunerite: Approximately 25 to 35% wispy yellow-green and occasional ≤2cm wisps and layers - overall these contain less carbonate downhole (22.1 — on) (17.3-22.1 - 15% carbonate).						
			Hematite - Limonite:						
			22.1 - 24.7: Approximately 40-60% hematite-limonite oxidation of grunerite layers in small fault/SHEAR ZONE						
			36.0-38.0: Approximately 45% hematite-limonite oxidation along discreet grunerite bands in metachert						
			38.0 - 52.7: ≤ 4% Hematite-limonite oxidation/alteration						
			52.7 - 55.0: Approximately 70 to 80% brick-red-orange hematite-limonite oxidation of core ~ very intense as core is "sinter-like" in appearance						
			55.0 - 60.7; generally ≤2% as fracture-fillings and layer parallel wisps						

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamah) Lake / Savant Lake area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	ASSAYS
17.3	60.7		Alteration: CONT'D					
			Carbonate: 17.3-22.1 ~ AS IN 4.5-16.0; approximately 15 to 20% as veinlets and disseminations in grunerite layers and wisps throughout the metachert.					
			Mineralization: Pyrite; trace as minor disseminations throughout -					
60.7	69.1		Grunerite - Metachert Breccia	60.7	63.7		80027	12
			Typically yellow-green well foliated grunerite bands and masses	63.7	65.2		80028	2
			containing 10% light grey lenticular ± 8cm metachert clasts and boudinaged	65.2	66.7		80029	1
			layers. Approximately 10-15% hematite oxidation throughout. Overall,	66.7	68.2		80030	2
			grunerite is very prominent in this section.	68.2	69.1		80031	1
			Generally non-CALCAREOUS AND NON-MAGNETIC					
			Foliation / compositional layers @ 30-35° to C.A.					
			Downhole contact sharp @ 45° to C.A.					
			66.7 – 68.1: Strongly hematitic layering (grunerite → hematite)					
			67.2 – 68.6: Broken core within above hematitic zone containing					

Diamond Drill Record

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NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
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MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamah) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
60.7	69.1		CONT'D: highly sheared textures ~ probable shear/fault zone.					
			Alteration: Grunerite: Approximately 60-70% as yellow green					
			≤ 10cm bands and wisps intercalated with metachert clasts and layers					
			and hematite altered bands.					
			Hematite: Overall 15%, locally 40% as brick-red					
			≤ 3cm bands which selectively replace grunerite banding.					
			Mineralization: Pyrite: <<1% as small clots and sub-hedral					
			cubes throughout section (in grunerite and metachert)					
69.1	72.4		Chlorite Schist:					
			Medium to dark green moderately homogeneous well foliated chlorite					
			schist containing 3-4% white discontinuous calcite veining.					
			Alteration: Calcite: approximately 4% as ≤ 3mm discontinuous					

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Sturgeon Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	ASSAYS
69.1	72.4		Alteration: cont'd					
			conformable carbonate veins generally increasing in abundance downhole.					
			Biotite (?): possible c/o light brown biotite as					
			possible conformable potassic alteration (?)					
			Mineralization: -NIL-					
72.4	79.5		Grunerite Metachert	72.4	73.9		80032	49
			Light grey homogeneous metachert intercalated with approximately	73.9	75.4		80033	93
			15-20% yellow-green ≤ 5cm conformable grunerite bands (layers)	75.4	77.4		80034	3
			and discontinuous wisps. Sections of core contain a strong	77.4	78.5		80035	9
			accompanying cleavage which cross-cuts and is axial planar to minor	78.5	79.5		80036	17
			folds which deform the grunerite layers. Approximately 3-5% conformable					
			black ≤ 1cm siliceous bands containing disseminated magnetite.					
			Non-calcareous and locally magnetic (magnetite).					
			Foliation (primary) / compositional layering @ 35-40° to c.a.					
			- second cleavage (S_2) @ 25° to c.a. - oblique					
			S_2/S_1 — S_2 — S_2/S_1					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneegbanda) Lake / Sawant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
72.4	79.5		CONT'D:					
			Downhole contact gradational over 50cm @ 34° to c.a.					
			77.7-78.3: Highly sheared and brecciated section — characterized by ≤ 2cm discontinuous metachert bands and clasts supported in an interstitial matrix of fine chloritic wisps and minor alotty sulphides. Chlorite also fills fractures sub-parallel to core axis and other minor cross-cutting fractures. Minor grunerite also present					
			Alteration: Grunerite: approximately 20% as yellow-green ≤ 3cm wisps and discontinuous conformable bands throughout — several locations contain ≤ 1cm magnetite-rich layers flanked by wisps and disseminations of grunerite ~ probable alteration of magnetite					
			Chlorite: 77.7-78.3m: 12% as fine fracture fillings in breccia ~ probable chloritization					
			Mineralization: Pyrrhotite: ≪1%, locally 1% as fine dissemination bands conformable to the main foliation/comp. layering and as ≤3mm clots in breccia section (77.7-78.3)					

Diamond Drill Record

COLLAR:		HOLE SURVEY		
		FOOTAGE	AZIMUTH	DIP
NORTH				
EAST				
ELEVATION				
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DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Savant Lake area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
72.4	79.5		Mineralization: cont'd					
			Pyrite: <<1% as small ≤1mm clots throughout and as					
			clots and stringers in brecciated section (77.7-78.3).					
79.5	88.4		Magnetite-(Grunerite)-Iron Formation	79.5	80.5		80037	2
			Medium to dark-grey metachert containing 70% dark-grey-black	80.5	81.8		80038	1
			≤3cm siliceous bands containing disseminated magnetite and minor	81.8	83.3		80039	10
			grunerite.	83.3	85.0		80040	7
			Non-calcareous and slightly magnetic (magnetite, pyrrhotite)	85.0	86.7		80041	2
			Foliation/compositional layering @ 34-40° to c.a.	86.7	88.4		80042	2
			Downhole contact sharp @ 30° to c.a.					
			81.8-83.3: Light grey metachert horizon containing 8% yellow-green					
			grunerite and 4% disseminated pyrrhotite and pyrite ~ all conformable					
			to compositional layering ~ some indication of moderate brecciation					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
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DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogank) Lake / Sevont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
79.5	88.4		CONT'D					
			Alteration: Grunerite: overall 3%, locally 8% as yellow-green wisps and bands intercalated with siliceous magnetite bands and in metachert (81.8-83.3) as anastomosing wisps and conformable discontinuous bands					
			Mineralization: Pyrite: 81.8-83.3; ≤ 3% as fine clots and raced bands, some "stockwork" textures ~ overall, mostly conformable to main foliation / comp. layering (S1)					
			Pyrrhotite: 81.8-83.5; ≤ 1% as fine disseminations and clots often associated with pyrite; minor anastomosing raced bands					
			Magnetite: ≤ 15% as fine disseminations in black siliceous bands					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
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DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneegani) Lake / Stuart Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb
88.4	105.0		Grunerite Metachert	88.4	90.9		80043	3
			Light gray to green-green homogeneous metachert containing 35%	90.9	93.0		80044	7
			yellow-green grunerite bands wisps and disseminations throughout. Minor	93.0	95.2		80045	390
			magnetite layers and intercalated chlorite distributed randomly throughout.	95.2	97.0		80046	3
			Compositional layering is well developed throughout and is often complexely	97.0	98.7		80047	29
			folded ~ intrafolial isoclines ~ in several locations.	98.7	101.3		80048	600
			Non-calcareous and locally magnetic (magnetite).	101.3	103.3		80049	6
			Foliation / compositional layering highly variable due to folding ~	103.3	105.0		80050	10
			from 10°-70° to c.A.					
			Downhole contact gradational over 20 cm. @ 35° to c.A.					
			90.9-91.5m: Highly siliceous black bands containing 5% disseminated					
			magnetite and ≤2% intercalated wispy grunerite. - similar to					
			79.5-88.4m described previously ~ possibly an inblock from uphole unit.					
			97.5-98.7: Broken hematite stained core containing 20% chlorite					
			- possible small fault zone -					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
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MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamah) Lake / Simmont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
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PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
88.4	105.0		CONT'D					
			Alteration: Grunerite: overall ≤ 35% as yellow-green wisps and ragged diffuse highly folded bands. Also occurs as fine wisps and disseminations in 90.9-91.5m with siliceous-magnetite layers ~ probable alteration of magnetite					
			Chlorite: 97.5-98.7m: ≤ 20% chlorite bands and disseminations in minor fault zone ~ possible chloritization					
			Hematite: overall ≤ 1%, locally 10% as small veinlets and minor disseminations throughout ~ some sections may be iron-carbonate ~ very difficult to get reaction w/ acid ~					
			Mineralization: Quartz-Vein: 98.3m: 15cm quartz-vein containing veinlets and disseminations of hematite and/or iron-carbonate ~ may be hematite + calcite veining ~ very poor reaction to acid.					
			Pyrite - trace; as small clots in metachert.					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	Au ppb	ASSAYS					
105.0	109.0		Grunerite-Magnetite-(Pyrrhotite)-Iron Formation	105.0	107.0	2.0	80051	1						
			Light grey to grey-green homogeneous metachert containing	107.0	109.0	2.0	80052	1						
			approximately 20% yellow-green grunerite layers and disseminations											
			and occasional 20 cm sections containing 10% ≤ 2cm black											
			magnetite bands flanked by bands of grunerite and disseminated											
			pyrrhotite. Minor chloritic layers and lenses throughout (≤3%).											
			Non-calcareous and locally magnetic (magnetite, pyrrhotite)											
			Foliation/compositional layering typically @ 30°-35° to C.A.											
			Downhole contact sharp @ 27° to c.A.											
			Alteration: Grunerite: overall 20%, locally 30% as yellow-											
			green ≤ 2cm bands and disseminations in metachert and as											
			alteration(?) of magnetite in magnetite-rich horizons - 106.5m.											
			Chlorite: overall ≤ 3% as minor layers, lenses and											
			intercalations randomly throughout ~ possible chloritization											
			Mineralization: Pyrrhotite: overall ≤ 3% as fine diffuse ≤1cm											
			bands and disseminations throughout unit.											
			Pyrite: trace; as minor disseminations											

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Swamp Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	Au ppb	ASSAYS
105.0	109.0		Mineralization: Cont'd						
			Arsenopyrite: trace; as ≤ 2mm rounded clots often associated with pyrite						
109.0	110.2		Chlorite Schist	109.0	110.2		80053	2	
			Dark to medium green, fine-grained homogeneous chlorite schist containing minor calcite veins.						
			Locally calcareous and non-magnetic						
			Foliation/compositional layering @ 35° to c.a.						
			Down hole contact sharp @ 35° to c.a.						
			Alteration: Calcite: approximately ≤1% as ≤ 2mm white veinlets which are largely conformable with the main foliation/compositional layering.						
			Mineralization: - No sulphides observed -						

Diamond Drill Record

COLLAR:		HOLE SURVEY		
		FOOTAGE	AZIMUTH	DIP
NORTH				
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Sawmont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
110.2	129.6		Grunerite-Magnetite Iron Formation	110.2	111.6		80054	1						
			Generally light to medium green to green-grey homogeneous metachert	111.6	113.6		80055	2						
			containing 45% yellow-green grunerite bands and wisps and	113.6	114.9		80056	2						
			up to 10% magnetite layers intercalated throughout. Overall, unit	114.9	116.9		80057	1						
			is well foliated and brecciated in various locations. Minor chlorite	116.9	118.8		80058	1						
			observed as conformable fracture-fillings throughout. Only minor	118.8	120.4		80059	2						
			sulphide content. Prominent iron-carbonate and limonite-hematitic	120.4	122.4		80060	1						
			alteration occurs within first 3 m of uphole contact.	122.4	124.3		80061	5						
			Locally calcareous and locally magnetic (magnetite, pyrrhotite)	124.3	126.2		80062	12						
			Foliation/compositional layering @ 35° to c.a. throughout	126.2	127.9		80063	17						
			Downhole contact gradational over 20 cm @ 40° to c.a.	127.9	129.6		80064	42						
			110.2-113.0: Brick-red to yellow-ochre iron-carbonate and minor											
			hematite-limonite alteration/oxidation replacement of grunerite											
			and magnetite layers in metachert. Moderate folding and brecciation											
			observed throughout.											
			127.9-128.3: Milky white quartz-vein or metachert containing											
			<<1% wisps of grunerite.											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneegaanii) Lake / Squant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
110.2	129.6		CONT'D					
			Alteration: Iron Carbonate: 110.2-113.0: Approximately 20% as brick-red-orange conformable alteration bands averaging ≤ 5mm. Layers and bands show some cross-cutting relationships.					
			Grunerite: overall 45% as yellow-green conformable bands and wisps averaging ≤ 2cm; and as fine wisps which flank and are intercalated with magnetite layers.					
			110.2-113.0: ≤ 2% as relict bands and conformable dissemination					
			Hematite - Limonite: 110.2-113.0 Approximately 10% as oxidation/replacement of pre-existing grunerite-magnetite layers in metachert.					
			Calcite: ≤ 2% as ≤1.5m cross-cutting bands and fracture fillings.					
			Chromium Mica: 113.2m; ≤1% as patchy alteration of breccia clasts and as small fillings in cross-cutting fractures					
			119.8-121.6: ≤ 1% as conformable fracture-fillings and as replacement of some grunerite layers. ~ possible ultramafic in vicinity					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS Ltd.
PROPERTY NAME KASH (KASHANEOGAMA) LAKE / SAVANT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS						
110.2	129.6		CONT'D:												
			MINERALIZATION: Magnetite: ≤10% as ≤1cm bands and smaller wisps and discontinuous layers throughout. Layers are often flanked by and intercalated with grunerite												
			Pyrrhotite: OVERALL ≤3%; locally 5% as fine wisps, clots and anastomosing networks ~ some banded conformable disseminations ~ possibly after magnetite												
			Pyrite: trace as small clots and fine disseminations												
129.6	133.8		GRUNERITE METACHERT	126.9	131.2		80065	54							
			Light grey to milky-white homogeneous metachert containing <<1% grunerite as wisps and fine disseminations. Minor pyrite, pyrrhotite and localized arsenopyrite throughout.	131.2	132.6		80066	1							
			Non-calcareous and non-magnetic	132.6	133.8		80067	8							
			Foliation / compositional layering where discernable @ 45° to C.A.												

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogana) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
129.6	133.8		CONT'D:											
			Alteration: Grunerite: ≤1% as fine conformable wisps and disseminations											
			133.4m: 10cm band of grunerite intercalated with 1% pyrite ≤1% pyrrhotite and ≤1% arsenopyrite											
			Chromium-Mica: possible fine-trace as conformable fracture fillings											
			Iron Carbonate: trace as fine grained conformable fracture-fillings throughout											
			Mineralization: Pyrite: <<1% as fine clots and disseminations / ragged fracture fillings throughout											
			133.4m: approximately 1% as fine ragged bands											
			Pyrrhotite: <<1% as fine ragged bands and disseminations											
			Arsenopyrite: 133.4m: approximately ≤1% as coarse ≤ 4mm rounded to subhedral clots and ragged bands, often associated with pyrrhotite.											

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogamak) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO K-89-01
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
133.8	—		E.O.H.											

Notes: Approximately 6 bits (H-8) used in drilling hole; abundant sand seams and large cavities ~ very difficult drilling – lost circulation – casing pulled –

Diamond Drill Record

COLLAR:
NORTH 1443N
EAST 43+87E
ELEVATION
LOGGED BY D. ELSBY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
collar	155	-60°
199'/60.6	-	-44°
439'/133.8		-40°
METHOD: DIP TUBE/ACID ETCH TEST		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS Ltd.
PROPERTY NAME KASH (KASHAMEQUAN) LAKE / SAVANT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME Pa 912888
COMMENCED 07 SEPT '89
FINISHED 08 SEPT '89
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb
0.0	2.1		CASING / OVERBURDEN					
2.1	28.2		Chlorite Schist and Silicified-Bleached Chlorite Schist	4.1	5.6		80068	5
			Alternations of pale green homogeneous well foliated chlorite schist	5.6	7.0		80069	11
			and light green-grey silica-sericite-chlorite schist. The latter rock	7.0	9.0		80070	9
			unit probably represents a silicified and altered version of the chlorite	16.7	18.8		80071	9
			schist unit ~ alteration has occurred along selective shears in the	23.8	26.5		80072	16
			S_2 deformation system.					
			Dark-green chloritic sections contain up to 7% ≤2cm white					
			carbonate veins subparallel to the main foliation throughout.					
			Altered sections contain ≤ 10% sericite (and possibly epidote)					
			bands (≤ 3cm) throughout.					
			Minor quartz-veining observed throughout altered sections.					
			Locally calcareous and non-magnetic					
			Foliation / metamorphic layering ($S_1 \wedge S_2$) @ 35° to c.a. uphole changing					
			to 55° downhole.					
			Downhole contact sharp @ 65° to c.a.					
			Broken core: 25.0 – 26.1m – minor carbonate weathering textures					

RECEIVED
OCT 27 1989
PATRICIA MINING DIVISION

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanik) Lake / Shamont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
2.1	28.2		CONT'D:											
			Alteration: Silicification: Random sections throughout unit contain significant silica (50-60%) associated with silicification of chlorite schist along S2 shears.											
			Sericite: overall, ≤ 25%, locally 40% as ≤ 3cm often diffuse bands, wisps and disseminations in altered sections											
			Epidote: possible epidote mineralization ~ ≤ 3% in altered sections as disseminations											
			Carbonate: white ≤ 2cm conformable calcite veins which occur conformable to layering/foliation in chlorite schist sections											
			- Silicified - Altered Sections: 4.1-9.0m; 9.6-10.8m; 12.5-12.9m; 15.4-16.4m; 16.7-18.8; 20.2-22.7m; 23.8-26.5m											
			Mineralization: Pyrite: trace throughout as ≤ 3mm clots in chlorite schist sections and as fracture fillings on broken surfaces											
			Quartz Veins: 12.5m: ≤ 2cm clear quartz vein, conformable to main foliation (S2) and compositional layering											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanak) Lake / Shamrock Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS
2.1	28.2		MINERALIZATION CONT'D						
			14.3m: ≤ 4cm milky quartz vein, conformable to main foliation (Sa) / compositional layering						
28.2	30.9		Quartz-Sericite Schist	28.2	30.9		80073	5	
			Light grey to green-grey fine-grained homogeneous well foliated quartz-sericite schist. Unit contains ≤ 3% clear ≤ 3mm quartz layers/veins which appear conformable to the main foliation/compositional layering ~ most quartz layers are folded intrafolial structures (isoclinal) which indicate that the layering was at some oblique angle (S1=So) to Sa, the main, prominent observed foliation, and has since been transposed into the Sa shear plane:						
			Alteration: Sericite: prominent, pervasive sericitization related to alteration/mineralizing event active prior and during Da						
			Iron Carbonate: <1% as highly disseminated alteration throughout unit.						

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kasn (Kashaneogana) Lake / Swamp Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	Au ppb	ASSAYS						
28.2	30.9		CONT'D												
			Mineralization: NO VISIBLE SULPHIDES / MINERALIZATION												
30.9	53.5		Banded Chlorite-Carbonate-Sericite Schist	42.6	43.5	0.9	80074	640							
			Dark green to grey-green well foliated and banded chlorite schist	46.8	47.3	0.5	80075	1600	(.046)						
			containing ≤ 15% white conformable carbonate veins/layers and	47.5	48.4	0.9	80076	10							
			occasional bands and disseminations of sericite. Overall, unit is	49.5	50.0	0.5	80077	5							
			moderately homogeneous and finely layered/banded. Minor quartz-veining	51.5	52.0	0.5	80078	2130	(.062)	} .067 AU			1.3m		
			with associated sulphides occurs randomly throughout.	52.3	52.8	0.5	80079	2480	(.072)						
			Generally calcareous and non-magnetic												
			Foliation (S2) / metamorphic layering (?) @ 50-55° throughout												
			Downhole contact sharp @ 45° to C.A.												
			Alteration: Carbonate: ≤ 15% white ≤ 3mm white carbonate (calcite)												
			veinlets which appear conformable to main banding observed throughout unit.												
			Sericite: ≤ 5% as patchy dissemination bands throughout												
			unit.												

Diamond Drill Record

COLLAR:		HOLE SURVEY		
		FOOTAGE	AZIMUTH	DIP
NORTH				
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashamesquanda) Lake / Summit Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
30.9	53.5		CONT'D											
			Mineralization: Pyrite: occurs in two modes; firstly as small clots and euhedral crystals throughout calcite schist and secondly as large clots intergrown with pyrrhotite in small quartz veins and boudinaged quartz-vein layers (now isolated lenses)											
			– overall pyrite ~ 1%											
			Pyrrhotite: as above, though less in percentage, often intergrown with pyrite											
			– overall pyrrhotite ~ <<1%											
			Arsenopyrite: trace as small clots randomly throughout section											
			– overall sulphides: generally small % with abundant sub-hedral crystal outlines ~ indication of late stage mineralization ~ probable Sn associated –											
			Quartz-Veining: 42.9–43.4m: 15% quartz-carbonate veining containing 8% clotted pyrite in quartz and chlorite schist –											
			– 46.9–47.1m: 20 cm irregular quartz-vein containing clotty masses of pyrrhotite and pyrite and patches of off-white-cream colored carbonate											
			49.2m: 3cm milky white quartz vein containing patchy											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneegamak) Lake / Sturgeon Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
30.9	53.5		Mineralization: cont'd					
			cream-colored carbonate and minor pyrite ~ note vein is bounded by					
			2cm bands of highly sheared chlorite-carbonate schist					
			52.5m: 3cm quartz-pyrite-pyrrhotite-arsenopyrite					
			vein - veining characterized by vuggy-sulphide-filled pockets					
53.5	55.2		Chlorite-Carbonate Schist					
			Dark to medium-green homogeneous highly sheared chlorite schist					
			containing ≤ 5% highly intercalated / sheared out carbonate veins.					
			Rock appears compositionally / texturally different than above unit					
			due to high degree of in-shearing of carbonate veins ~ almost					
			homogeneous appearance.					
			Calcareous and non-magnetic					
			Foliation (S_2) @ 45° to c.a.					
			Downhole contact gradational over 50cm @ 50° to c.a.					
			Alteration: Carbonate: ≤ 5% intercalated white calcite(?) ~ mostly					
			sheared out / disseminated along foliation due to S_2					

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqamak) Lake / Shamont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

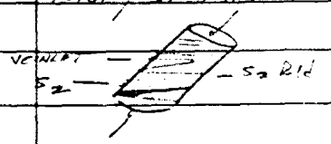
FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
53.5	55.2		Alteration: cont'd					
			Sericite: ≤1% as disseminations/fine intercalations throughout unit					
			Mineralization: Pyrite: trace as small lenticular clots oriented subparallel to the dominant foliation					
55.2	81.4		Banded Chlorite-Carbonate-Sericite Schist	56.3	56.8		80080	11
			Similar to 30.9-53.5m; dark green homogeneous well foliated	57.1	57.7		80081	10
			chlorite schist containing ≤10% white intrafolial carbonate veinlets	57.7	58.6		80082	7
			throughout. Unit contains minor quartz-veining and patchy sericite and	59.7	60.7		80083	24
			potassic alteration. Overall, unit is quite homogeneous and non-spectacular.	60.7	61.6		80084	23
			Calcareous and generally non-magnetic					
			Foliation/metamorphic layering @ 50° to C.A.					
			Downhole contact gradational over 1.5m @ 40° to C.A.					
			Alteration: Carbonate: overall ≤10%, locally 15% as					
			≤5mm white mostly intrafolial veinlets, some cross-cutting					

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogamah) Lake / Spivont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

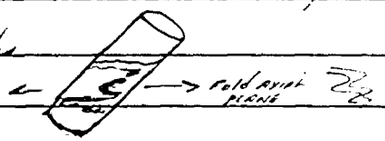
FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
55.2	81.4		Alteration: cont'd											
			veinlets ~ probably isolated limbs of minor folds as some isoclinal											
			folding of veins is visible (hence ~ veinlets are most likely pre-S_2)											
			 — minor component of late cross-cutting —											
			fracture-filling veinlets - post-S_2											
			Sericite: overall 2-3% as diffuse disseminated bands											
			throughout chlorite schist											
			Potassic: ~ possible biotite ~ 1-2% as patches and											
			diffuse disseminated bands throughout											
			Silicification: 74.5-74.8; small section of silicified											
			potassic altered schist ~ very homogeneous											
			Mineralization: Quartz-Veining: 56.5m: 15cm quartz-vein assemblage											
			(40% quartz-veins / 15cm) ~ trace pyrite											
			57.1-57.7: 8% quartz-veining comprised of ≤ 2cm irregular, lenseoid											
			quartz veins ~ note carbonate pressure shadows on lenticular "clasts"											
			- trace pyrite - pyrrhotite											

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Squant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
55.2	81.4		Mineralization: cont'd					
			57.8-58.4: ≤ 5% quartz veining comprised of ≤ 1cm irregular					
			clear cross-cutting quartz-veins containing intercalated chloritic material					
			and minor-trace pyrite-pyrrhotite.					
			59.7-61.4: ≤ 5% quartz-veining comprised of ≤ 1cm clear to					
			milky quartz-veins ~ often lenticular and boudinaged and					
			folded by S_2 ~ trace sulphides					
			←  → fold axial plane					
			Pyrite: trace overall in quartz-vein sections and in chloritic					
			material ~ pyrite is often sub-hedral to euhedral ~					
			probably a late feature					
			Pyrrhotite: trace throughout					
81.4	85.9		Chlorite-Sericite Schist					
			Dark to medium green-grey homogeneous fine-grained well-foliated					
			chlorite schist containing ≤ 3cm diffuse and patchy sericite bands.					
			Only minor carbonate veining and sparse quartz-veining.					

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweesakai) Lake / Sayant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
81.4	85.9		CONT'D					
			Generally non-calcareous and non-magnetic					
			Foliation/textomorphic layering @ 35° to c.a.					
			Downhole contact sharp @ 35° to c.a.					
			Alteration: Sericite: overall ≤ 3% patchy diffuse sericite bands					
			highly interbanded with chloritic layers ~ often difficult to					
			estimate percentage					
			Potassic: ≤ 1% as brown-tan diffuse patches and					
			bands of biotitic material ~ related to main sericite-					
			quartz-vein alteration event.					
			Mineralization: Pyrite: trace as vuggy fracture fillings ~ composed of					
			both fine grained amorphous pyrite masses and ≤1mm cubes					
			Quartz-veining: minor <<1% as ≤ 3mm					
			veins and rounded lenses containing trace pyrite and small					
			patches of red-brown iron-carbonate alteration.					

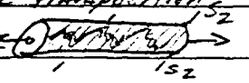
Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamah) Lake / Sewant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	ASSAYS
85.9	112.0		Chlorite-Carbonate-Sericite-Biotite Schist	85.9	87.6		80085	2
			Dark green to black banded well foliated chlorite schist containing	87.6	89.6		80086	4
			≤ 10% white carbonate veinlets, diffuse layers and patches of sericite,	92.0	92.7		80087	1
			and brown-black patchy diffuse patches and layers of biotite. Minor	93.7	94.2		80088	5
			quartz-veining throughout and minor-trace sulphides throughout.	94.8	95.6		80089	4
			Overall, similar to 30.9-53.5m.	95.8	96.7		80090	4
			Calcareous and non-magnetic	110.8	111.3		80091	1
			Foliation / metamorphic layering @ 40° to c.a.					
			Downhole contact gradational over 1.5m @ 40° to c.a.					
			85.9-89.6: HIGHLY SHEARED SECTION - ABUNDANT - BIOTITE AND TRACE SULPHIDES					
			Alteration: Carbonate: ≤ 10% white ≤ 5mm generally intraliminal calcite (?) veinlets throughout. Some cross cutting relationships observed ~ mostly due to incomplete transposition of veinlets along S_2 i.e. remnant fold limbs 					
			Sericite: ≤ 8% as ≤ 10cm diffuse patches and bands often highly intercalated with chlorite and biotitic material.					
			Potassic: ≤ 7% as ≤ 30cm sections of dark-brown-black patchy, diffuse bands of biotitic material					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Spinout Lake area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
85.9	112.0		Alteration: cont'd					
			which is often highly intercalated with chloritic and sericitic material					
			i.e. highly intercharged - Notable section: 92.0 - 92.7m					
			Mineralization: Quartz Veining:					
			93.9m: 2cm white-clear quartz-vein ~ subparallel to S_2 foliation					
			94.9m: as above					
			95.4m: as above ~ contains possible wisps of garnerite-sericite (?)					
			96.1m: 10cm white barren quartz-vein					
			96.5m: 4cm white barren quartz-vein					
			110.9-111.1: ≈ 10% quartz-veining with minor pyrrhotite					
			Pyrite: trace throughout as small clots and subhedral crystals ~ no appreciable concentration or affinity					
			Pyrrhotite: trace as small clots and ragged band throughout unit ~ generally increasing in frequency downhole -					

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Simont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
112.0	119.1		Chlorite Schist					
			Dark to medium green homogeneous well foliated chlorite					
			schist containing ≤ 1% white carbonate veinlets and minor intercalated					
			sericite and possible amphibole. Unit becomes coarser-grained downhole.					
			Locally calcareous and non-magnetic					
			Foliation / metamorphic layering @ 45° to c.a. uphole to 30° to c.a. downhole.					
			Downhole contact gradational over 1.0 m @ 30° to c.a.					
			Unit contains some coarser sections which may reflect original composition					
			and flow texture.					
			- Note - minor chloritic shears near 116.9 m / (spaced-pressure-solution) Second cleavage @ 114.0					
			Alteration: Carbonate: ≤ 1% as ≤ 3mm white calcite veinlets oriented					
			mostly subparallel to the main foliation.					
			Sericite: minor sericitization in diffuse patchy zones					
			Mineralization: Pyrite: trace as ≤ 2mm clots in chloritic					
			material					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashanegorama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
119.1	130.8		Chlorite-Carbonate-Sericite Schist	123.6	124.3		80092	9				(quartz vein ~ 1cm py+cpy @ 123.9m)		
			Similar to 55.2-81.4 m; Dark to medium-green homogeneous chlorite schist containing ≤ 7% white discontinuous carbonate veinlets and 3-5% diffuse patches and bands of sericite intercalated with chlorite. Potassic alteration-biotite-accounts for approximately 4% of section as wispy dark-brown-black patches and bands intercalated with chlorite.											
			Calcareous and non-magnetic.											
			Foliation/metamorphic layering @ 50° to c.a.											
			Downhole contact sharp @ 60° to c.a.											
			Alteration: Carbonate: ≤ 7% as ≤ 3mm white often discontinuous and folded calcite veins.											
			Sericite: 3-5% as ≤ 3cm patches and diffuse bands of sericite intercalated with chlorite and occasional biotite											
			Potassic: 2-4% as dark-brown diffuse bands and wisps intercalated with chlorite and occasional sericite											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS
119.1	130.8		CONT'D						
			Mineralization: Pyrite: trace as small clots and disseminations in chlorite schist and minor patches in localized quartz-veins. Chalcopyrite: trace as small clots associated with pyrite in quartz-veins. Quartz-veining: Occasional ≤ 1cm discontinuous quartz-veins occur randomly throughout unit; commonly contain localized pyrite and chalcopyrite.						
130.8	136.8		Sericite-Quartz-Chlorite Schist and Chlorite Carbonate Schist	130.8	131.8		80093	4	
			Medium to dark green banded well foliated, silicified sericite-quartz schist containing 15% intercalated chlorite and displays localized breccia textures ~ this lithology is interlayered with .2-1.5m sections of dark-green chlorite carbonate schist ~ mostly homogeneous chlorite schist which contains 3% intercalated and folded carbonate veins. Locally calcareous and non-magnetic. Foliation / metamorphic layering @ 60° to C.A.						

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashamegamah) Lake / Simont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-02
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
130.8	136.8							
			unit is highly deformed ~ altered ~ in which layers show a more anastomosing, almost braided texture ~					
			Alteration: Sericite / Silicification: most sections which contain sericite are also silicified ~ overall, ≤ 30% sericite as ≤ 2cm bands and anastomosing wisps intercalated with chlorite schist and quartz layers and breccia fragments.					
			Carbonate: ≤ 3% in chlorite-schist sections as ≤ 3mm highly folded discontinuous layers intercalated with chlorite ~ typical as described in previous units.					
			Chromium-mica: trace as small clots @ 131.4m					
			Mineralization: Pyrite: trace as small clots in chlorite-carbonate schist sections. –					
136.8	—		E.O.H.					
449'			NOTES: CASING PULLED					

Diamond Drill Record

COLLAR:	
NORTH	1+41S
EAST	14+37E
ELEVATION	
LOGGED BY	D. ELSBY
DATE LOGGED	
MAP REFERENCE NO.	

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
collar	190	-55
199'/60.6m		-50°
399'/121m		-49°
599'/182m		-47°
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneegana) Lake / Sylvant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME Pa 903332
COMMENCED 09 SEPT '89
FINISHED 10 SEPT '89
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS pt-group	
0.0	6.1		Casing / Bedrock Boulders							
6.1	25.2		Talc-Magnesium-Carbonate-Serpentine Schist	10.4	11.8		80094	1		
			Typically interbanded dark-green-grey talc and ≤35% white layers and	11.8	14.0		80095	3		
			knotted masses of magnesium carbonate. Serpentine, 15%, occurs as	14.0	15.7		80096	4		
			intercalations within the above lithologies. Magnesium carbonate layers	15.7	17.4		80097	15		
			occur mostly as highly folded, boudinaged and sheared ≤ 2cm layers within	21.0	22.5		80098	29		
			the dominant talc schist giving the rock an irregularly banded	22.5	24.0		80099	5		CR-MKA SECTIONS
			appearance. Sections of yellow-orange and red-pink iron-carbonate	24.0	25.2		80100	4		
			are also present. Chromium-mica appears as minor wisps and disseminations							
			from 21.0-25.2, with increasing percentage downhole. Random							
			euhedral pyrite masses occur as late porphyroblasts throughout							
			the lithology. Minor chlorite occurs as intercalations throughout.							
			Moderate to poorly calcareous (due to high Mg in carbonate) and							
			non-magnetic.							
			Foliation / metamorphic (compositional?) layering highly variable from							
			0° to 70° to C.A.							
			Downhole contact is gradational over 1.5m ~ variable angle to C.A.							

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OCT 23 1989
PATRICIA MINING DIVISION

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS LTD.
PROPERTY NAME KASH (KASHAMEOSAKI) LAKE / SHWANT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
6.1	25.2		CONT'D					
			Alteration: Talc: ≤50% as dark-green-grey coarse and often discontinuous layers (≤3cm) between magnesium-carbonate inter-layers and serpentine. Probable alteration of ultramafic body ~ olivine, dunite etc.					
			Magnesium Carbonate: ≤35% as cream-white ≤2cm irregular highly deformed bands / layers which have been isoclinally folded, sheared and boudinaged throughout (PART OF REGIONAL CARBONATE ALTERATION ~ DUE TO HIGH MG CONCENTRATION U-MAFIC, CA-CARBONATE NOT TOO COMPONENT OF ALT)					
			Serpentine: ≤15% as green to yellow-green patches and bands intercalated within the above lithologies. ~ probable alteration of ultramafic lithologies.					
			Chlorite: ≤5% as dark-green intercalations throughout the section ~ probable chloritization.					
			Iron Carbonate: 14.0-16.4: ≤12% as red-pink disseminations and diffuse bands ~ alteration appears mostly conformable to the main foliation / metamorphic layering					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqamak) Lake / Shamont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
6.1	25.2		Alteration : cont'd											
			Chromium Mica : 21.0 - 25.2m : ≤ 4% as disseminations and											
			wisps within magnesium-carbonate layers.											
			Silicification : note, unit becomes silicified with beginning of											
			chromium-mica alteration ~ magnesium-carbonate is totally silicified											
			Mineralization : Pyrite : <<1% to trace as ≤ 3mm subhedral											
			clots and masses ~ occurs randomly throughout ~ in localized sections											
			- note minor hematite staining on crystal surfaces											
25.2	41.5		Talc-Magnesium-Carbonate-Chrome-Mica Schist	25.2	26.7		80101	2						
			Highly interbanded / intercalated assemblage of talc schist and magnesium-	26.7	28.2		80102	1						
			carbonate layers with 8-10% wispy chromium-mica alteration. Unit is	28.2	29.7		80103	3						
			similar to previously described lithology but has increased chromium-mica	29.7	31.2		80104	9						
			alteration and silicification. Silicification appears to be associated with	31.2	32.7		80105	7						
			chromium-mica alteration ~ magnesium-carbonate layers are totally	32.7	34.0		80106	9						
			silicified. Note, some boudinage of mg-carbonate layers give appearance	34.0	35.5		80107	4						
			of a breccia texture.	35.5	36.9		80108	4						(NOTE: 36.57 - 36.74 IN OFFICE)

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Shivant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS
25.2	41.5		CONT'D	36.9	38.4		80109	2	
			Locally calcareous (poor reaction to acid due to mg content) and	38.4	39.9		80110	6	
			non-magnetic	39.9	41.5		80111	1	
			Foliation / metamorphic (compositional layering ?) layering variable						
			from 0° to 80° to c.a.						
			Downhole contact appears gradational over 1.5 m.						
			ALTERATION:						
			Talc: ≤ 30% as dark-green to black (white when powdered)						
			layers intercalated between magnesium-carbonate layers.						
			Magnesium-Carbonate / Silicified: ≤ 50% as ≤ 10cm						
			irregular, highly deformed bands and layers, now, completely						
			silicified						
			Chromium-Mica: ≤ 15% as apple-green wisps and						
			prominent disseminations throughout silicified magnesium						
			carbonate layers - generally decreases toward downhole						
			contact.						

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogana) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
25.2	41.5		Alteration: cont'd											
			Serpentine: trace as minor yellow-green patches and veins											
			Chlorite: trace as green patches and wisps ~ mostly intercalated with talc.											
			Hematite - Limonite: trace as red-brown stain on fracture surfaces											
			Mineralization: Quartz-Veining: trace as ≤ 2mm cross-cutting clear quartz-veins ~ occur randomly throughout section											
			Pyrite: << 1% to trace as ≤ 3mm sub-hedral to euhedral cubes and clots ~ occur intermittently throughout section.											
41.5	49.5		Magnesium-Carbonate-Talc Schist	41.5	42.8		80112	3						
			Highly interlayered assemblage of dark green to black talc schist and white magnesium-carbonate layers - similar to 6.1-25.2m	42.8	45.8		80113	3						

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS Ltd.
PROPERTY NAME KASH (KASHAWEOGAMA) LAKE / SAVANT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
41.5	49.5		CONT'D:					
			Talc layers average 30-35% as ≤ 2cm wavy bands ; magnesium-					
			carbonate layers average ≤ 50-55% , ≤ 1cm wavy, often highly folded					
			interbands. These carbonate layers are still partially silicified and contain					
			trace chromium-mica alteration. Overall, unit appears highly deformed					
			dimensionally folded and boudinaged ~ probable result of					
			post S_1 alteration (hence talc alteration/mg-carbonate layering) and					
			S_2 shearing which has largely transposed the S_1/S_0 layering into					
			the S_2 plane					
			Poorly calcareous and non-magnetic					
			Foliation/metamorphic layering varies from 30°-50° to c.a.					
			Downhole contact sharp @ 35° to c.a.					
			Alteration: Magnesium-Carbonate: average ≤ 55% as ≤ 2cm					
			highly folded and boudinaged layers ~ layers are mostly					
			silicified ~ probably still in silicification halo surrounding the					
			CR-MICA ALTERATION unit ~ uphole ~					

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
41.5	49.5		Alteration: cont'd											
			Talc: average ≤35% as dark green wavy banded											
			and highly folded and boudinaged layers											
			Chlorite: ≤3% as wispy and intercalations											
			throughout											
			Chromian-mica: <<1% as fine dissemination											
			and wisps randomly throughout first several metres											
			adjacent to up-hole contact											
			Iron-Carbonate: <<1%-trace as red-pink dissemination											
			which replace magnesium-carbonate bands @ 47.5m											
			Mineralization: Pyrite: trace as subhedral to euhedral crystal											
			masses (≤3mm) and cubes ~ looks to be a late											
			feature which has overgrown the main Sa foliation.											
49.5	58.0		Chlorite-Carbonate Schist											
			Dark green homogeneous chlorite schist containing ≤25% intercalated											
			carbonate ~ unit has a mottled appearance. Unit is well foliated											

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
49.5	58.0		CONT'D					
			as a result of Se shearing.					
			Carbonaceous and non-magnetic.					
			Foliation / metamorphic layering @ 30°-35° to c.a.					
			Downhole contact gradational over 10 cm @ 40° to c.a.					
			Alteration: Carbonate: ≤25% carbonate (calcite?) as white					
			wisps and discontinuous bands, intersheared with chloritic					
			material ~ note carbonate does not react as readily with acid					
			as calcite normally does ~ suspect a magnesium component					
			due to presence of altered ultramafic.					
			Mineralization: Pyrite: <<1% to trace as small ≤1mm clots and					
			as smeared coating on broken core surfaces ~ shear planes ~					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
58.0	199.3		Talc-Magnesium-Carbonate Schist	168.5	170.2		80114	22						
			Similar to 6.1-25.2; Dark-green homogeneous talc schist	170.2	171.7		80115	2				1% py		
			containing 30-35% white ≤ 8cm folded / boudinaged magnesium-	171.7	173.2		80116	21						
			carbonate layers throughout. Minor patches of serpentine and chlorite	196.4	198.2		80117	8				qtz vein + py		
			throughout. Overall, unit is highly folded and sheared by D2 deformation.	198.2	199.3		80118	9				sericite + carb + silicif.		
			Poorly calcareous and non-magnetic											
			Foliation / metamorphic layering highly variable from 0° to 70° to c.a.											
			Downhole contact sharp @ 35° to c.a.											
			BROKEN CORE / FAULT GOUGE: 83.1-83.2m; 93.0-94.0; 97.4-97.6;											
			115.0-115.5m; 116.8-117.0; 119.6-120.0; 130.2-130.7; 141.1-141.2;											
			165.0-165.1.											
			105.4-107.0m: Sub-unit composed of 90% homogeneous talc and 10%											
			magnesium-carbonate as fine disseminations											
			122.8-129.2: Sub-unit composed of 70-80% magnesium carbonate layers and											
			masses with 10-15% intercalated (folded) talc schist or talc											
			appears more disseminated throughout instead of discreet bands											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS Ltd.
PROPERTY NAME KASH (KASHAMEOGAMA) LAKE / SAVANT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
58.0	199.3		CONT'D					
			136.2-137.9m: Serpentine(?)-Talc-Chlorite-Schist: subunit composed of light green serpentine-talc masses (poss. mg-carb.) and interpolated chloritic material, dark-green talc occurs as ≤ 2mm lenticular clots ~ often with pressure-shadow "tails" and as disseminations throughout ~ unit has a dark speckled appearance due to talc clots ~ possibly a dike?					
			166.5-168.5: Serpentine-Talc Schist; similar in appearance to 136.2-137.9m with light-yellow-green assemblage of talc-serpentine and possibly magnesium-carbonate (a fairly homogeneous assemblage) containing ≤ 2mm lenticular clots of dark-green talc ~ possible wall rock assimilation from dike intrusion?					
			182.7-188.4: Serpentine-Talc Schist; AS IN 136.2-137.9; 166.5-168.5 - possible dike intrusion -					
			Note: As downhole contact is approached ~ talc-magnesium-carbonate schist is very highly deformed and contains minor quartz-veining. Rock contains a slightly greater percentage of magnesium carbonate ~ minor chromium-mica disseminations (198.0m) and some general silicification.					

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
58.0	199.3		CONT'D:					
			Alteration: Talc: approximately 60-70% as dark green layers, bands and highly folded masses intercalated with white magnesium-carbonate layers. Also occurs as small lenticular clots in "dike"? sub-units.					
			Magnesium-Carbonate: 30-35% as white ≤ 2cm highly folded and boudinaged layers throughout					
			Serpentine: light yellow-green soft "fibrous" mineral associated with talc schist in "dike" sub-units ~ alteration of an ultramafic dike intrusive to main altered ultramafic body.					
			Chlorite: ≤ 1% as wisps and disseminations throughout					
			Chromium-Mica: trace as disseminations @ 198.0, max down-hole content.					
			Mineralization: Pyrite: <<1% as "late" sub-hedral to euhedral clots and cubes (≤ 4mm) throughout unit					
			Quartz-Veins: 75.2m: 7cm barren white conformable quartz-vein					
			197.8-199.3: 10% quartz veins ≤ 3cm ~ mostly white and barren					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamah) Lake / Sawyer Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
				199.3	200.5		80119	15						
199.3	216.1		Chlorite - Carbonate Schist	206.2	207.5		80120	49						
			Dark to medium-green homogeneous well foliated chlorite schist containing	207.5	209.8		80121	17						
			15-20% white carbonate stringers and disseminations. Minor quartz-veining											
			occurs throughout. Unit appears to have a fine-grained texture adjacent to											
			the up-hole contact and becomes progressively more coarse down-hole ~											
			probable chilled margin ~ also reflects intensity of deformation adjacent											
			to contact i.e. viscosity contrast, competent mafic volcanic and less-											
			competent ultramafic assemblage. Overall unit shows signs of carbonate											
			alteration and minor silicification.											
			Calcareous and non-magnetic											
			Foliation / metamorphic layering @ 50° to c.a.											
			212.8-216.1: Unit is much coarser grained and is poorly foliated with											
			wispy patches (≤1cm) of carbonate throughout ~ unit also contains											
			5% ≤ 2mm rounded clear quartz clasts (augen) ~ probably derived											
			from structural intersections of S_1 and S_2 coupled with metamorphism											
			and hydrothermal silicification.											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamia) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
199.3	216.1		CONT'D.: Note: NO IRON-CARBONATE / CHROMIUM-MICA @ CONTACT					
			Alteration: Carbonate: ≤ 20% as white intrafolial veinlets and as anastomosing, wispy patches (more irregular and wispy downhole ~ away from contact with altered ultramafic).					
			Silicification / Quartz Augen: ≤ 5% overall as disseminated silicification and as quartz-augen ~ mostly present as a halo surrounding contact zone.					
			Chromium-Mica: localized, disseminated in chlorite schist-quartz-vein sections					
			Mineralization: Quartz-Veining: 206.4–206.9m: ≤ 8% quartz veins, ≤ 4cm containing wisps, clots and rims of cream-colored carbonate and disseminated chromium-mica (≤ 1%).					
			207.6–208.6m: ≤ 50% quartz-veining consisting of ≤ 40cm milky white quartz-veins containing remnants / intercalations of bleached / chromium-mica altered chlorite schist ~ chromium mica = ≤ 1%.					
			Pyrite: trace, as small (≤ 2mm) euhedral to subhedral cubes ~ appear to be a late feature which overprints the main S2 foliation					

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-03
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
216.1	—		E.O.H.											
			NOTES: - CASING PULLED -											

Diamond Drill Record

COLLAR:	
NORTH	2+57S
EAST	19+61 E
ELEVATION	
LOGGED BY	D. ELSBY
DATE LOGGED	
MAP REFERENCE NO.	

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
COLLAR	160	-50
199'/60		-49
399'/121		-45°
639'/195		-38°
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Sturgeon Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME Pa 903333
COMMENCED 11 SEPT '89
FINISHED 14 SEPT '89
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb
0.0	1.2		Casing into bedrock					
1.2	10.6		Grunerite-Magnetite Iron Formation	1.2	3.1		80122	7
			Light to medium-grey homogeneous metachert containing ≤ 25% wispy	3.1	5.0		80123	27
			banded and disseminated grunerite, 8-10% tan-brown wispy banded	5.0	7.0		80124	1
			potassic alteration and 10-12% ≤ 2cm wispy magnetite bands and	7.0	9.3		80125	13
			disseminations. Unit also contains random 5-10cm sections of black	9.3	10.6		80126	4
			siliceous material in metachert (non-magnetic). Overall unit appears to be					
			an altered thinly banded, sheared magnetite iron-formation.					
			Non-calcareous and locally magnetic (magnetite / pyrrhotite).					
			Foliation / compositional layering @ 45° to c.a.					
			Downhole contact gradational over 20cm @ 50° to c.a.					
			Alteration: Grunerite (Iron Amphibole): typically ≤ 25% as wispy and					
			often discontinuous bands and disseminations which often flank and are					
			intercalated with common magnetite bands. Probable alteration of magnetite					
			Potassic: ≤ 10% light-tan to brown wispy, disseminated					
			patches and bands which appear mostly conformable to the main					

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OCT 27 1989
PATRICIA MINING DIVISION

Diamond Drill Record

COLLAR:

NORTH	HOLE SURVEY		
EAST	FOOTAGE	AZIMUTH	DIP
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashabowie Lake / Shoot Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
1.2	10.6							
			foliation/compositional layering ~ often associated with grunerite					
			Chlorite: ≤ 3% as wisps and intercalations throughout unit					
			Iron Carbonate: ≤ 1% as red-brown wisps and disseminations					
			clay fractures and broken core ~ associated with trace hematite-limonite ~ fe-carbonate also associated with pyrite occurrence					
			MINERALIZATION: Magnetite: Typically ≤ 10% as remnant ≤ 2cm					
			wisps, bands, and disseminations often intercalated and flanked by					
			grunerite and sometimes potassic alteration patches					
			Pyrite: << 1% as vuggy fracture-fillings ~ some					
			euhedral cubes and masses					
			Pyrrhotite: << 1% as disseminations, wisps, and fracture-fillings ~					
			often associated with relict magnetite bands ~ also associated					
			with pyrite					
			~ overall ~ insignificant sulphide content ~					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneobana) Lake / Spivant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
10.6	15.4		Grunerite Metachert	10.6	12.3		80127	26
			Light grey homogeneous metachert containing ≤ 7% wispy banded	12.3	14.3		80128	157
			grunerite which can be seen to replace magnetite bands i.e. ghost banding	14.3	15.4		80129	58
			of magnetite. Minor relict magnetite as wispy disseminations mostly intercalated					
			with grunerite. Iron-carbonate occurs as ≤ 2cm conformable bands and					
			as fracture-fillings. Minor trace sulphides					
			Non-calcareous and locally weakly magnetic.					
			Foliation/compositional layering variable from 0° to 50° to c.a.					
			Downhole contact sharp @ 25° to c.a.					
			Alteration: Grunerite: ≤ 7% as wispy bands and disseminations ~					
			bands have replaced magnetite as relict magnetite banding is					
			visible in minor disseminations throughout the metachert					
			Iron-Carbonate: ≤ 1% as ≤ 2cm conformable bands, wispis,					
			and fracture-fillings; often intercalated with grunerite					
			or flanked by grunerite ~ probable alteration of magnetite					

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Stewart Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS
10.6	15.4		CONT'D						
			MINERALIZATION: Pyrite: <<1% - trace as small clots and late fracture-fillings, often associated with arsenopyrite						
			Arsenopyrite: <<1% - trace as small euhedral clots and masses, mostly as late fracture-fillings often associated with pyrite						
			Magnetite: trace as relict disseminations within iron-carbonate and grunerite alteration zones.						
15.4	18.4		Grunerite - Magnetite - Iron Formation	15.4	16.8		80130	23	
			Light grey to green-grey homogeneous metachert containing ≤ 15% magnetite	16.8	18.4		80131	10	
			bands and ragged disseminations and 30% yellow-green grunerite bands						
			and ragged disseminations. Grunerite is seen to clearly replace magnetite bands						
			throughout the section. Trace sulphides throughout						
			Non-calcareous and locally magnetic (magnetite, pyrrhotite)						
			Foliation/compositional layering @ 35° to c.a.						
			Downhole contact sharp @ 50° to c.a.						

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS						
15.4	18.4		CONT'D												
			Alteration: Grunerite: ≤ 30% as ragged disseminations and bands which are seen to replace magnetite bands												
			Mineralization: Magnetite: ≤15% as relict bands and wisps (≤ 5mm) flanked and intercalated with grunerite. Pyrite: trace, as late, euhedral crystals ~ often fracture-filling. Pyrrhotite: trace, as banded disseminations and clots, often in association with magnetite												
18.4	21.0		Grunerite - Black Metachert	18.4	19.6		80132	8							
			Light green-grey to black metachert containing irregular, patchy grunerite alteration zones ~ alteration is often non-conformable to main foliation/comp. layering.	19.6	21.0		80133	13							
			Non-calcareous and non-magnetic												
			Foliation/compositional layering @ 50° to c.a.												
			Downhole contact gradational over 30cm @ 0° to 55° to c.a. (FOLDED, HIGHLY VARIABLE)												

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashamegamah) Lake / Spivont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
18.4	21.0		CONT'D											
			Alteration: Grunerite: ≤35% as highly irregular patchy zones within the dominantly black metachert; also occurs as a 30 cm horizon @ 19.8m with a diffuse uphole contact and sharp downhole contact ~ overall, one of few sections where grunerite is patchy and not in conformable layers											
			Black silica: black silicified sections of metachert, uncertain as to mineralization/alteration which is producing the black coloration.											
			Mineralization: Magnetite: trace as fine wisps and disseminations.											
			—NO VISIBLE SULPHIDES OBSERVED—											
21.0	25.7		Grunerite-(Iron Amphibole)-Magnetite Iron-Formation	21.0	22.5		80134	18						
			Similar to 15.4-18.4m; assemblage of grey metachert hosting abundant	22.5	24.2		80135	21					(22.2-22.3 in office)	
			grunerite alteration of magnetite ~ grunerite occurs in bands which are	24.2	25.7		80136	15						
			seen to replace magnetite layers. Note ~ some iron-amphibole is tan-brown in color and some yellow-green ~ probable two different iron-amphiboles											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqamak) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
21.0	25.7		CONT'D :					
			Non-calcareous and locally magnetic (magnetite)					
			Foliation highly variable from 0° to 70° to c.a.					
			Downhole contact gradational over 40 cm @ 55° to c.a.					
			Alteration : Grunerite : ≤ 20% as ≤ 1cm bands, wisps and dissemination					
			which are seen to replace magnetite layers and bands ~ alteration bands					
			are mostly conformable to main foliation/compositional layering					
			Iron-Amphibole : ≤ 10% as above, mostly tan-brown amphibole					
			~also an alteration product of magnetite					
			Mineralization : Magnetite : ≤ 18% as discreet ragged bands and					
			wisps often flanked by and interpolated with grunerite and					
			brown iron-amphibole					
			Pyrite / Pyrrhotite : ≤1% to trace as fine disseminations					
			and fracture-fillings					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kasn (Kashameqanda) Lake / Spruce Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS						
25.7	35.4		Iron Amphibole - Black Metachert	25.7	26.7		80137	167							
			Light to medium grey to predominantly black homogeneous metachert	26.7	28.2		80138	4							
			containing up to 15% wispy grunerite; ≤3% iron-carbonate; and	28.2	29.7		80139	6							
			≤ 5% minor quartz-veining. Overall, unit is well foliated and banded with	29.7	32.7		80140	2							
			minor sulphides throughout.	32.7	35.4		80141	3							
			Non-calcareous and non-magnetic.												
			Foliation/compositional layering typically @ 50° to C.A.												
			Downhole contact gradational over 40 cm @ 50° to C.A.												
			Alteration: Grunerite: ≤ 15% as wisps and ragged bands ≤2cm												
			- also occurs as broad disseminations and some minor fracture -												
			fillings in metachert.												
			Iron Carbonate: overall ≤ 3%. locally 30% as ≤ 4cm												
			bands of red-pink carbonate alteration; mostly conformable												
			to the main foliation/compositional layering - also occurs												
			as late minor fracture - fillings												

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogamu) Lake / Simont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	Au ppb	ASSAYS						
25.9	35.4		CONT'D												
			Mineralization: Quartz-Veining: overall, ≤ 20% as ≤ 4mm bands and highly folded "stringers" in metachert ~ most likely infilling of fractures and some relict "breccia" textures in unit												
			Pyrite: <<1% as small clots, ragged bands, and banded disseminations; predominantly from 26.3 to 27.7m ~ also minor late fracture-fillings												
			Arsenopyrite: <<1% - trace as euhedral clots and masses and ragged bands, predominantly from 26.3 to 27.7m - often associated with pyrite.												
35.4	40.6		Grunerite Grey-"Black" (Graphitic)-Metachert	35.4	36.9		80142	18							
			Light grey to black homogeneous metachert containing ≤ 5% grunerite	36.9	38.9		80143	8							
			as wisps and intercalations. Minor iron-carbonate as banded disseminations	38.9	40.6		80144	3							
			and fracture-fillings.												
			Note: Black Metachert ~ very homogeneous aphanitic, brittly fractured, with sheen on broken surface ~ appears to be alignment of some black												

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS LTD.
PROPERTY NAME KASH (KASHAMEOGAMA) LAKE / SAWANT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
35.4	40.6		CONT'D					
			mineral ~ but silicified — probably graphitic material (NON-MAGNETIC) —					
			often contains numerous small tightly folded quartz-veins (?) or light-grey metachert intercalations ~ possible interbedding graphitic-non-graphitic metachert material.					
			LIGHT GREY METACHERT : 35.4-36.7					
			GRAPHITIC METACHERT : 36.7-40.6					
			Non-calcareous — non-magnetic					
			Foliation/compositional layering @ 55° to c.a.					
			Downhole contact sharp @ 50° to c.a.					
			Alteration: Grunerite: ≤ 5% as random, intermittent wisps and disseminated bands ~ possible alteration of magnetite					
			Iron Carbonate: ≤ 1% as red-orange and red-pink disseminations and fracture-fillings ~ both conformable and non-conformable.					
			Mineralization: Quartz-Veining: ≤ 4% as conformable and non-conformable bands and layers ~ often isoclinally folded in graphitic metachert sections ~ some apparent "veining" may be intefolded wisps of light-grey metachert.					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanak) Lake / Stuart Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
40.6	116.5		Sericite-Iron Carbonate-Grimerite Metachert and Graphitic METACHERT	40.6	42.3		80145	4						
			Typically green-grey to green-brown grimerite and iron carbonate altered	42.3	43.7		80146	1						
			metachert (iron-formation) containing intermittent bands of light-grey	43.7	45.6		80147	5						
			metachert and black graphitic (silicified) metachert. Overall, majority of	45.6	48.2		80148	7						
			unit is highly altered, often friable, and indurated; altered sections are	49.4	52.0		80149	5						
			only separated from each other by intervals of light-grey and black	52.0	53.2		80150	3						
			graphitic metachert. Little or no sulphides visible (will only split and	53.5	55.1		80151	1						
			sample altered sections)	55.7	56.4		80152	1						
			Poorly calcareous (iron-carbonate) and Non-magnetic	58.0	59.8		80153	2						
			Foliation/compositional layering @ 50° to c.a.	59.8	61.7		80154	1						
			Downhole contact sharp @ 65° to c.a. * PROBABLE KLFZ *	62.1	64.5		80155	12						
				64.5	66.0		80156	2						
			40.6-48.2m: 40% sericite; 25% iron-carbonate; 30% intermixed	66.0	67.9		80157	2						
			light grey and dark-grey-black metachert; possible 5% grimerite	67.9	70.7		80158	1						
				71.5	73.0		80159	4						
			48.2-49.4: 90% graphitic metachert; 7% light-grey metachert, interpolated	73.0	74.4		80160	4						
			~ some breccia textures show fragmental graphitic metachert with light grey	74.7	76.2		80161	3						
			metachert matrix; 3% iron-carbonate as conformable bands and minor	76.2	77.7		80162	1						
			fracture-fillings	77.7	78.8		80163	5						

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanak) Lake / Shamut Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb						
40.6	116.5		CONT'D:	78.8	80.0		80164	1						
				80.0	81.5		80165	1						
			49.4 - 52.0 m: ≤45% (grunerite) sericite; ≤45% iron-carbonate intercalated as	81.5	84.5		80166	18						
			conformable bands ~ contain ≤10% light grey metachert as irregular	88.5	91.1		80167	6						
			bands and ≤1cm clasts ~ possible healed breccia – some silicification	91.1	92.0		80168	1						
				92.5	94.4		80169	8						
			52.0 - 52.2: Predominantely dark grey metachert ~ minor light-grey	94.4	95.9		80170	4						
			m-chert as wisps and discontinuous layers	95.9	98.2		80171	1						
				98.2	100.3		80172	1						
			52.2 - 53.2: ≤80% iron-carbonate; ≤15% (grunerite)-sericite	100.3	102.3		80173	1						
			intercalated throughout ~ very difficult to separate mineralization	102.3	104.2		80174	1						
			types – ≤5% intercalated light grey metachert as conformable	104.2	106.8		80175	1						
			wisps and bands.	106.8	109.2		80176	2						
				114.2	115.2		80177	1						BLACK CHERT MYLONITE ? + QV + PY (TRACE)
			53.2 - 53.5: Predominantly black graphitic metachert											
			53.5 - 55.1: ≤40% (grunerite) sericite; ≤40% iron-carbonate as											
			intercalations throughout; ≤20% light grey and black metachert											
			as intercalations and conformable bands and isolated clasts ~ possible											
			remnant fragmental texture.											

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogamah) Lake / Sawant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
40.6	116.5		CONT'D:											
			55.1–55.7: 50% black, 50% light grey metachert											
			55.7–56.4: ≤70% (grunerite)-sericite; ≤20% iron-carbonate as homogeneous intercalations throughout; ≤10% light-grey metachert as wisps, fragments and conformable layers (≤3cm)											
			56.4–57.4m: Predominantely graphitic metachert with minor (≤20%) intercalated grunerite and iron carbonate as conformable wisps and disseminations											
			57.4–58.0: 60% graphitic metachert; 40% intercalated (grunerite) sericite / iron-carbonate											
			58.0–61.7m: ≤40% (grunerite)-sericite; ≤40% iron-carbonate as homogeneous intercalations ~ mostly conformable to main foliation; ≤20% light and dark grey metachert bands and wisps											
			61.7–62.1m: Predominantely black-grey metachert containing minor iron-carbonate alteration and minor intercalations of light-grey metachert ~ some breccia texture ~ i.e. discontinuous bands of black ai-chert in											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashabowie) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
40.6	116.5		CONT'D					
			61.7–62.1: cont'd: light-grey m-chert; minor wisps and disseminations of grunerite					
			62.1–70.7m: ≤40% (grunerite) sericite in massive bands and wispy layers intercalated with ≤40% iron-carbonate as bands and disseminations; approximately 20% light to dark-grey metachert as bands and wisps (≤10cm) – grunerite-sericite bands are often interbedded with metachert (possible replacement of magnetite bands) / minor pyrite along conformable fractures					
			70.7m–71.5m: Mixed horizon of dark grey and light grey metachert with ≤4% disseminated grunerite					
			71.5–74.4m: ≤60% iron-carbonate as bands, wisps and disseminations intercalated with ≤20% (grunerite) sericite disseminations ~ again, the two alteration types are thoroughly intercalated and difficult to separate; ≤20% light and dark-grey metachert as discontinuous bands and clots ~ some minor folding and boudinage & highly sheared fragments – minor chloritization along fractures					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Sturgeon Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
40.6	116.5		CONT'D											
			74.4 – 74.7m: Predominantly black graphitic metachert containing ≤20% mixed iron-carbonate and grunerite alteration as wisps and disseminated conformable bands.											
			74.7 – 81.5m: ≤ 70% iron-carbonate alteration as bands and disseminations throughout ~ intercalated and thoroughly intermixed with ≤ 20% (grunerite) sericite alteration bands and wisps; ≤10% intercalations of grey and black metachert; ≤1% wisps and disseminations of chromium-mica – Overall, unit appears thoroughly altered and indurated, ruggy pitted carbonate weathering.										
			81.5 – 92.0: Light grey to black-graphitic metachert breccia, containing ≤10% intercalated grunerite wisps and disseminations and ≤ 20% iron-carbonate alteration of (sericite? grunerite) patches and as random patches and fracture-fillings throughout – note: graphitic material is often wispy and in patches in dark-grey metachert ~ looks like an alteration texture almost ~ or a sheared breccia ~ Minor-trace pyrite as small euhedral cubes; mostly along late fracture systems										

Diamond Drill Record

COLLAR:		HOLE SURVEY		
NORTH		FOOTAGE	AZIMUTH	DIP
EAST				
ELEVATION				
LOGGED BY				
DATE LOGGED				
MAP REFERENCE NO.		METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
40.6	116.5		CONT'D:											
			92.0 – 92.5m: Light-grey – black graphitic metachert ± breccia; contains ≤ 1% orange-red iron-carbonate alteration along compositional interlayers ~ possible grunerite banding prior to iron-carbonate alteration.											
			92.5 – 109.2m: ≤ 30% (grunerite) – sericite intercalated with ≤ 60% yellow-brown iron-carbonate ~ two mineralogies are thoroughly intermixed and difficult to isolate from each other; ≤ 10% light grey metachert as discontinuous layers and lenses ~ result of inclined folding and boudinage – unit(s) (40.6–116.5) may also represent an altered package of mafic volcanics which contain metachert interbeds ~ minor metachert may represent deformed quartz-veins – minor chloritic interbeds occur as carbonate interbeds throughout – overall, unit is intensely and shows vuggy, pitted carbonate weathering – 103.5 – 103.8 – broken – crushed core										(SAMPLE TAKEN TO OFFICE)
			109.2 – 116.5m: Black – Graphitic Metachert or black aphanitic homogeneous rock, siliceous; contains 20% finely interbanded discontinuous, folded and boudinaged quartz layers ~ average ≤ 3mm width											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kasn (Kashameqanda) Lake / Squant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
40.6	116.5		CONT'D					
			109.2-116.5 : CONT'D : ~ probable quartz veining along early-formed fractures which have since been sealed and transposed –					
			Note: this unit may represent the end of the iron-formation horizon i.e. contact unit with the KLFZ as all rocks after 116.5 are of a different character/composition					
			– uncertain as to significance of the graphitic units					
			– overall, this unit appears to have been highly sheared and saturated with silica ~ i.e. quartz veining and micro-quartz-veining ~					
			–texture also resembles a recrystallized ~ healed, highly sheared breccia ~ related to KLFZ (possible mylonite)					
			ADDITIONAL COMMENTS:					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashanegrand) Lake / Spinnaker Lake area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
116.5	142.9		Sericite - Quartz Schist	117.0	119.2		80178	1						
			Light green - grey - homogeneous well foliated sericite schist containing	119.2	121.2		80179	2						
			10-15% quartz vein/metachert fragments, boudins and subrounded	127.4	128.9		80180	3						minor sulphides
			lenses. Most quartz/metachert is conformable to the main foliation/	131.0	132.1		80181	9						
			composition banding. Minor grunerite and conformable chloritic bands											
			fragments. Minor carbonate veining near uphole contact. Unit generally											
			becomes more chloritic as downhole contact is approached. Overall, quartz/											
			metachert fragments and discontinuous layers appear highly deformed ~ presumably											
			only relict sheared out minor fold limbs and porphyroblasts remain.											
			Non-calcareous and non-magnetic											
			Foliation/metamorphic layering @ 60°-65° to C.A.											
			Downhole contact gradational over 20cm @ 60° to C.A.											
			Note: entire unit is moderately to well silicified -											
			118.4-118.7m: quartz vein/metachert ~ fractures contain grunerite/sericite											
			127.0-128.2 : ≤ 40% quartz veining ~ crude discontinuous layers intercalated											
			with patches and ragged bands of sericite ~											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogama) Lake / Sawmont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
116.5	142.9		CONT'D:					
			Alteration: Sericite: ≤85% as layers, ragged bands and wispy patches intercalated with quartz vein / metachert fragments.					
			Carbonate: ≤1%, minor white carbonate bands near uphole contact					
			Iron-Carbonate: trace near up-hole contact as fine disseminations in diffuse bands and along minor, late fractures					
			Mineralization: Quartz-Veining: ≤15% overall as highly discontinuous isolated fragments, boudins and layers throughout a indicator of significant shearing - some quartz fragments have been flattened / elongated parallel to the main S_2 foliation ~ 25:1; 50:1 elongation -					
			OBSERVATIONS: General lack of iron-carbonate alteration on south side of KLF2 may suggest that fe-carbonate alteration was prior to current position of KLF2 stratigraphy ~ i.e. fe-carbonate early ~ only N side rocks affected & later sericite overprint ∴ look for fe-carbonate alteration on S. side KLF2 for indicator of KLF2 movement / offset					
			FE-CARB = S_1 event SERICITE-CHLORITE = S_2 event					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaweogama) Lake / Sturgeon Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
142.9	194.7		Chlorite-Sericite-Carbonate Schist	160.6	161.9		80182	1						quartz vein + cr-ap x
			Light grey to grey-green homogeneous chlorite schist containing ≤ 20%	161.9	163.6		80183	31						
			disseminated and intergranular sericite and ≤ 5% white carbonate veinlets.	179.1	180.2		80184	4						2-3% pyrite in chl schist
			Unit is well foliated and contains one major and abundant minor sericite	186.9	187.3		80185	21						small 1cm qtz + py @ 187.1m
			veins which contain minor pyrite and pyrrhotite. Sulphides are often euhedral											
			and appear to be late features. Abundant evidence of minor and micro-											
			intrafolial structures ~ indicative of significant shearing active adjacent to											
			the KLFZ.											
			Moderately calcareous and non-magnetic											
			Foliation @ 65° to C.A. throughout											
			167.3 – 169.1 – : indurated and carbonate altered chlorite-sericite schist, possible shear zone											
			180.9 – 181.4: Brecciated chlorite-carbonate schist - possible fault/shear zone											
			149-155.0m: BROKEN CORE/FAULT GOUGE - SOME GREY-GREEN CLAY											
			Alteration: Sericite: approximately ≤ 20% as dissemination and											
			occasional diffuse bands (≤1cm) throughout ~ part of regional sericitization											
			event related to the KLFZ and splay shears.											
			Carbonate: ≤ 5% as ≤ 3mm white coarsely carbonate											
			veinlets throughout ~ part of regional sericitic/carbonitization											
			event.											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME NORTHERN DYNASTY EXPLORATIONS Ltd.
PROPERTY NAME KASH (KASHAMEOGAMA) LAKE / SAVANT LAKE AREA
DRILLING CONTRACTOR LANGLEY DRILLING / BRAMPTON, ONT.
ASSAYER ACME ANALYTICAL LABORATORIES LTD.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
142.9	194.7		Alteration: CONT'D											
			Iron-Carbonate: <1% as minor-red-brown diffuse patches and minor fracture fillings ~ random throughout											
			Potassic: trace ~ as small brown-tan patches and discriminations, random and localized features ~											
			Chromium-Mica: trace, localized within and around quartz-vein contact @ 160.6 ~ small wisps and disseminations / fracture-fillings											
			Mineralization: Quartz-Veining: 160.6-163.6: Light-grey homogeneous quartz-vein containing trace wisps of grunerite and patches of sericite ~ possible metachert layer ~ more probably a quartz-vein.											
			— <1% quartz-veining with associated sulphides throughout rest of section:											
			Pyrite: <<1% as late euhedral cubes and 1-2mm ragged bands in chlorite schist and associated with minor quartz-veining											
			Pyrrhotite: trace as above											

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashanegrana) Lake / Dumont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-04
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
194.7	—		E.O.H.											
			Notes: - Casing Pulled —											

Diamond Drill Record

PAGE 1 OF

COLLAR:	
NORTH	0+83S
EAST	36+66E
ELEVATION	
LOGGED BY	D. ELSBY
DATE LOGGED	
MAP REFERENCE NO.	

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
collar	145°	-50°
199'/60.6		-48°
399'/121.6		-35°
599'/182.5		-29.2°
800'/243.8		-26°
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqgama) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME Pa. 912887
COMMENCED 14 Sept '89
FINISHED 17 Sept '89
PROJECT NO.

FROM m	TO m	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	Au ppb	ASSAYS					
0.0	3.1		CASING / BEDROCK											
3.1	32.7		Chlorite-(Biotite) Schist	20.1	20.7		80186	22						QUARTZ-VEINS
			Dark green homogeneous well foliated chlorite schist containing	21.4	22.1		80187	290						+ PY + PO
			minor quartz veins and white carbonate veinlets. Unit contains minor wisps											
			and bands of brown-black-biotite as conformable intercalations.											
			Locally calcareous and non-magnetic											
			Foliation / metamorphic layering @ 45° to c.a. uphole to 75° to c.a. downhole											
			Downhole contact gradational over 50cm @ 47° to c.a.											
			Alteration: Carbonate: overall ≤ 3%; locally 10%; note: 3.1-20.0 ~ only trace white ≤ 3mm carbonate veinlets; 2.0-32.7, steadily increasing carbonate veinlets downhole											
			31.2-31.7: 70% white carbonate veinlets, complexly folded into interference patterns; dome & basin											

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OCT 27 1989
PATRICIA MINING DIVISION

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashabowie) Lake / Shant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
3.1	32.7		CONT'D:											
			Mineralization: Quartz-Veining: 20.4-20.5: 10cm white quartz vein containing wisps of chlorite schist, minor cream-colored carbonate patches and minor clots of pyrite											
			21.8-21.9m: 10cm white quartz-vein containing minor patches of cream-colored carbonate and 1% pyrrhotite in clots; <1% pyrite in clots.											
			31.5m: 5cm white quartz-vein containing minor pyrite as small clots ~ enveloped in complexly folded carbonate unit (31.2-31.7)											
			— <1% quartz veining throughout ~ often folded with main foliation axial planar (S_2) ~											
			Pyrrhotite: trace overall, locally 1% as small clots and anastomising wisps											
			Pyrite: trace overall as small clots and euhedral cubes											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneebanna) Lake / Swan Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	WIDTH	NO.	ASSAYS						
32.7	124.6		Chlorite-Carbonate Schist	33.0	33.9		80188	24						
			Light to medium green homogeneous well foliated chlorite schist	36.4	37.0		80189	18						
			containing ≤ 15% white carbonate veinlets. Unit also contains minor	38.5	39.1		80190	13						
			quartz veins throughout. Minor sericite in some sections. Minor sphalerite in	56.6	57.1		80191	7						ZINC TRENCH SPLIT & REMOVED TO OFFICE
			quartz & downhole extension of sphalerite-trench.	61.8	62.2		80192	22						
			Calcareous and non-magnetic	67.5	68.7		80193	7						
			Foliation/metamorphic layering variable @ 35°-65° to C.A.	80.5	81.0		80194	20						
			Downhole contact gradational over 20cm @ 70° to C.A.	85.0	85.5		80195	5						
			Note: random grey silicified sections throughout ~ not quartz-veins											
			Alteration: Carbonate: overall, ≤ 15% locally 20% ≤ 3mm white											
			wispy often discontinuous - conformable carbonate veinlets.											
			54.0 - 69.0: noticeable increase in carbonate veining ~ approx 25%											
			throughout section; 67.5-68.7; ≤ 30% carbonate veining as ≤ 10cm											
			diffuse irregular bands.											
			Sericite: ≤ 1% as minor disseminations throughout											
			67.5 - 69.7; ≤ 4% sericite as ≤ 3cm disseminated bands											

Diamond Drill Record

COLLAR:
NORTH
EAST
ELEVATION
LOGGED BY
DATE LOGGED
MAP REFERENCE NO.

HOLE SURVEY		
FOOTAGE	AZIMUTH	DIP
METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanda) Lake / Sylvant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
32.7	124.6		Alteration: CONT'D					
			intercalated with massive carbonate veining					
			Chromium-mica: 57.0m; small 8mm band disseminated;					
			adjacent to 2mm band of massive sphalerite stringers					
			Mineralization: Quartz-Veining:					
			36.4-37.0: ≤ 3% quartz-veining as ≤ 1cm conformable veinlets					
			containing minor pyrite and pyrrhotite					
			38.8m: 10cm white quartz-vein containing minor patches of					
			carbonate					
			67.5-68.6: ≤ 3% quartz-veining intercalated with massive carbonate					
			patches and bands and intercalated sericitic bands.					
			56.6m: 2cm wide siliceous vein intercalated with 1cm band of sericite					
			and 5mm band of massive sphalerite stringers = ZINC TRENCH					
			57.0m: 3cm wide siliceous vein intercalated with chlorite-sericite					
			and 2mm of sphalerite stringers flanked by 8mm band of disseminated					
			chromium-mica alteration = ZINC TRENCH ZONE					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneogana) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
32.7	124.6		Mineralization: cont'd					
			Pyrite: trace throughout as small ≤ 2mm clots and					
			euhedral cubes					
			Pyrrhotite: trace throughout as small ≤ 2mm clots and					
			ragged 1mm bands					
			Sphalerite: 56.4m: 5mm band of fine (<1mm) anastomosing					
			stringers ~ down dip extension of zinc trench					
			57.0: 2mm band of fine (<1mm) anastomosing					
			stringers flanked by disseminated chromium-mica alteration					
124.6	141.3		Quartz-Chlorite-Sericite Conglomerate (Savant-Narrows)					
			Light grey to green-grey unit composed of alternating ≤ 5cm granular					
			siliceous layers; ≤ 2cm wispy chlorite layers and intercalations; ≤ 2cm					
			wispy and disseminated bands of grey-green sericite; and quartzose ~ possibly					
			granitoid ≤ 10cm rounded clasts throughout. Unit has an overall					
			banded appearance: note, many siliceous bands may be portions of					
			larger siliceous clasts which have been cored ~ now unrecognizable as					
			clasts; unit also contains ≤ 4% white contermable carbonate					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashanegoanii) Lake / Spinnt Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
124.6	141.3		CONT'D :					
			veinlets throughout					
			Locally calcareous and non-magnetic					
			Foliation / compositional layering @ 60-65° to c.a.					
			Downhole contact gradational over 50cm @ 70° to c.a.					
			Note: moderate to good kink-banding throughout unit					
			Alteration: Sericite: disseminated throughout and as ≤ 2cm conformable					
			bands ~ associated with regional sericitization event ~ may also be					
			associated with carbonate alteration event / some sericite alteration rims around clasts					
			Carbonate: ≤ 4% throughout as ≤ 4mm conformable					
			bands and disseminations ~ associated with regional carbonate					
			alteration event.					
			Epidote-Sericite: possible epidote alteration (sericite ?)					
			in siliceous clasts ~ probable alteration of mafics in granitoid clasts (?)					
			Mineralization: Pyrite: <<1% - trace as ≤ 2mm lenticular clots and					
			euhedral cubes ~ some clots contain minor hematite oxidation					
			around their boundaries					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanda) Lake / Spinnt Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
124.6	141.3		Mineralization: CONT'D:											
			Pyrrhotite: trace as ≤1mm lenticular and sub-rounded clots											
141.3	174.0		Chlorite - Carbonate Schist / KLFZ	146.1	146.6		80196	11						<1% Py in chl schist
			Similar to 32.7-124.6; typically medium to dark-green well foliated chlorite schist containing ≤4% white conformable carbonate veinlets. Minor sericite as disseminations throughout. Minor pyrite as lenticular clots and masses throughout.											
			Locally calcareous and non-magnetic.											
			Foliation / metamorphic layering @ 70° to C.A.											
			Downhole contact sharp @ 80° to C.A.											
			168.4-174.0 ~ strong compositional banding and kink-banding with minor folding ~ approaching KLFZ - minor quartz veining											
			Alteration: Carbonate: ≤4% as white ≤3mm conformable wisps, irregular layers and small patches ~ part of regional carbonatization event ~ increases to 5% locally @ 168.4-174.0											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanda) Lake / Swamp Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
141.3	174.0		Alteration: cont'd					
			Sericite: mostly as minor disseminations and ≤ 2mm layers throughout					
			Mineralization: Pyrite: <<1% as ≤ 3mm lenticular clots and amorphous patches throughout ~ minor disseminations also ~					
			-appears along small, <1mm, fractures as late fracture-fillings					
			-no quartz-vein association-					
			-Note: as KLFZ is approached, strong banding is developed, mostly compositional ~ strongly kink-folded and asymmetric disharmonic minor folding ~ no increase in mineralization visible					
174.0	174.9		KASH LAKE FAULT ZONE					
			Dark grey highly brecciated and clay altered chlorite carbonate schist - typical fault gouge - ~ some preserved folds between gouge sections					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
	FOOTAGE	AZIMUTH	DIP
NORTH			
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashaneosaula) Lake / Shivant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
174.0	174.4		CONT'D											
			- chlorite schist is present on both sides of fault ~ only significant folding is present adjacent to the main fault zone											
			- some conjugate fractures present -											
174.4	215.6		Chlorite - Carbonate Schist	183.7	184.7		80197	83						
			Light to medium green homogeneous well foliated chlorite schist containing ≤ 8% white conformable carbonate veinlets in sections. Some sections are homogeneous and contain only 1-2% carbonate as intercalations. Downhole unit contains 2-3% ≤ 8mm iron-carbonate bands. Locally calcareous and non-magnetic. Foliation/metamorphic layering @ 75° to c.a. Downhole contact gradational over 1m @ 75° to c.a.						YVON ROY SAYS TOO MUCH PYRITE -				
			Alteration: Carbonate: ≤8% white conformable carbonate veinlets averaging ≤ 4mm ~ some display prominent kink folding ~ related to major regional carbonate alteration event ~ alteration generally decreases downhole.											

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashabowie) Lake / Dymont Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
174.4	215.6		Alteration cont'd					
			Sericite: ≤1% overall as minor bands and disseminations throughout					
			Iron Carbonate: trace as ≤5mm bands and disseminations within 3m of the down-hole contact.					
			Mineralization: Pyrite: <<1% to trace as fine disseminations and subhedral to euhedral ≤2mm cubes throughout chlorite schist.					
215.6	243.5		Chlorite-Sericite-Schist					
			Alternating light green-grey and dark green ≤1cm bands and contorted layers of chlorite schist and chlorite sericite schist. Unit is well foliated and contains minor ductile folds and flexural-slip folds whose limbs and hinge regions have been fractured and faulted by brittle shearing.					
			Unit also contains ≤1% ≤1cm bands of iron-carbonate and potassic alteration.					

Diamond Drill Record

COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqanii) Lake / Spivant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS
215.6	243.5		CONT'D					
			Overall unit displays well developed compositional banding; minor silicification throughout.					
			Locally calcareous and non-magnetic					
			Foliation / compositional layering @ 75° to C.A.					
			Alteration: Sericite: ≤ 8% overall as ≤ 1cm bands and disseminations throughout					
			Potassic: ≤ 1% as ≤ 1cm bands of pink-brown alteration - also minor disseminations throughout					
			Iron-carbonate: trace as pink-orange vuggy weathering disseminations and minor layers.					
			Carbonate: trace as ≤ 1mm white conformable layers and disseminations.					
			Mineralization: Pyrite: trace, as minor disseminations and euhedral dots.					
			Hematite: trace as red-grey metallic bands, often folded and fractured ~ replacement / oxidation of?					

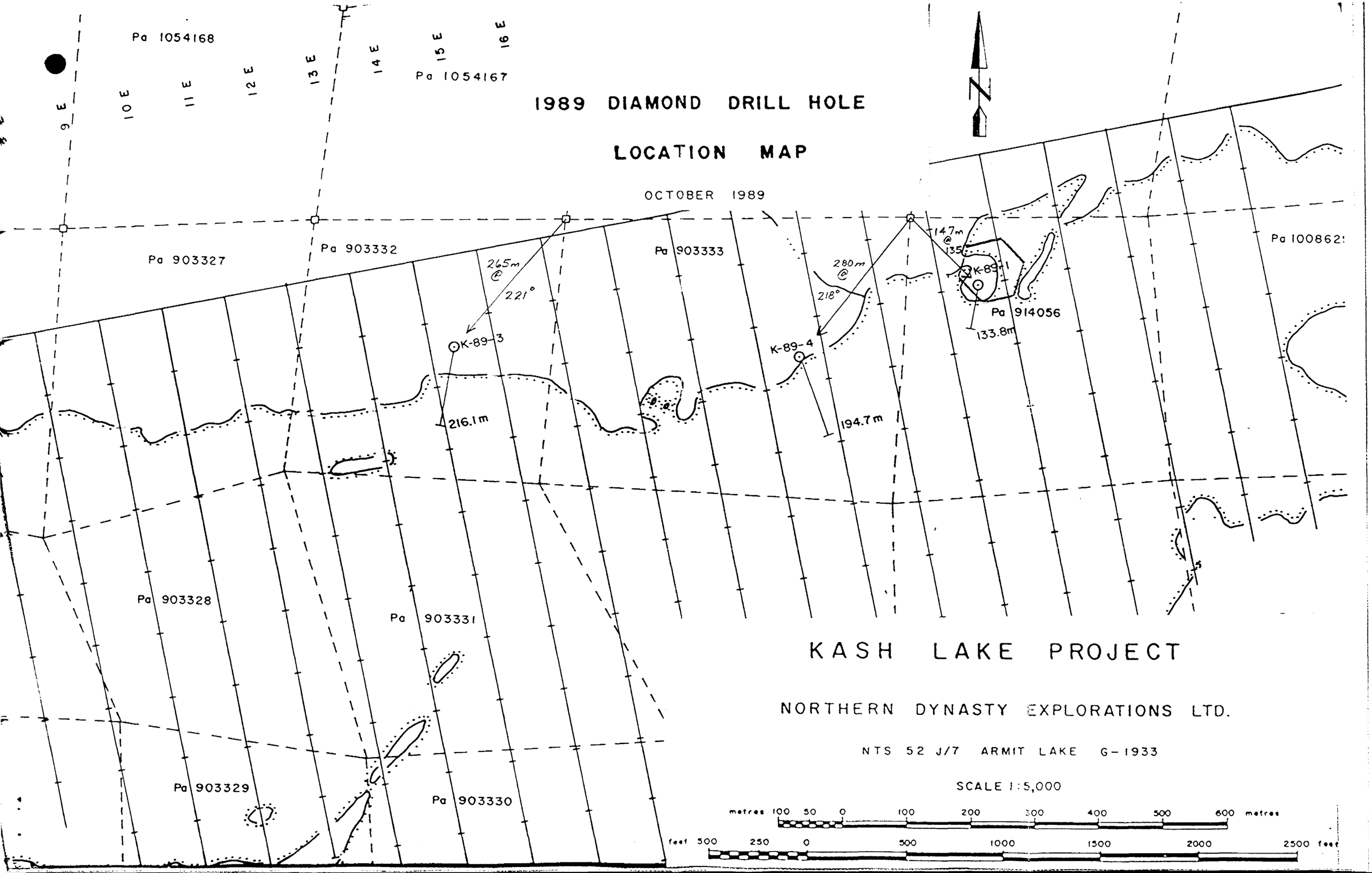
Diamond Drill Record

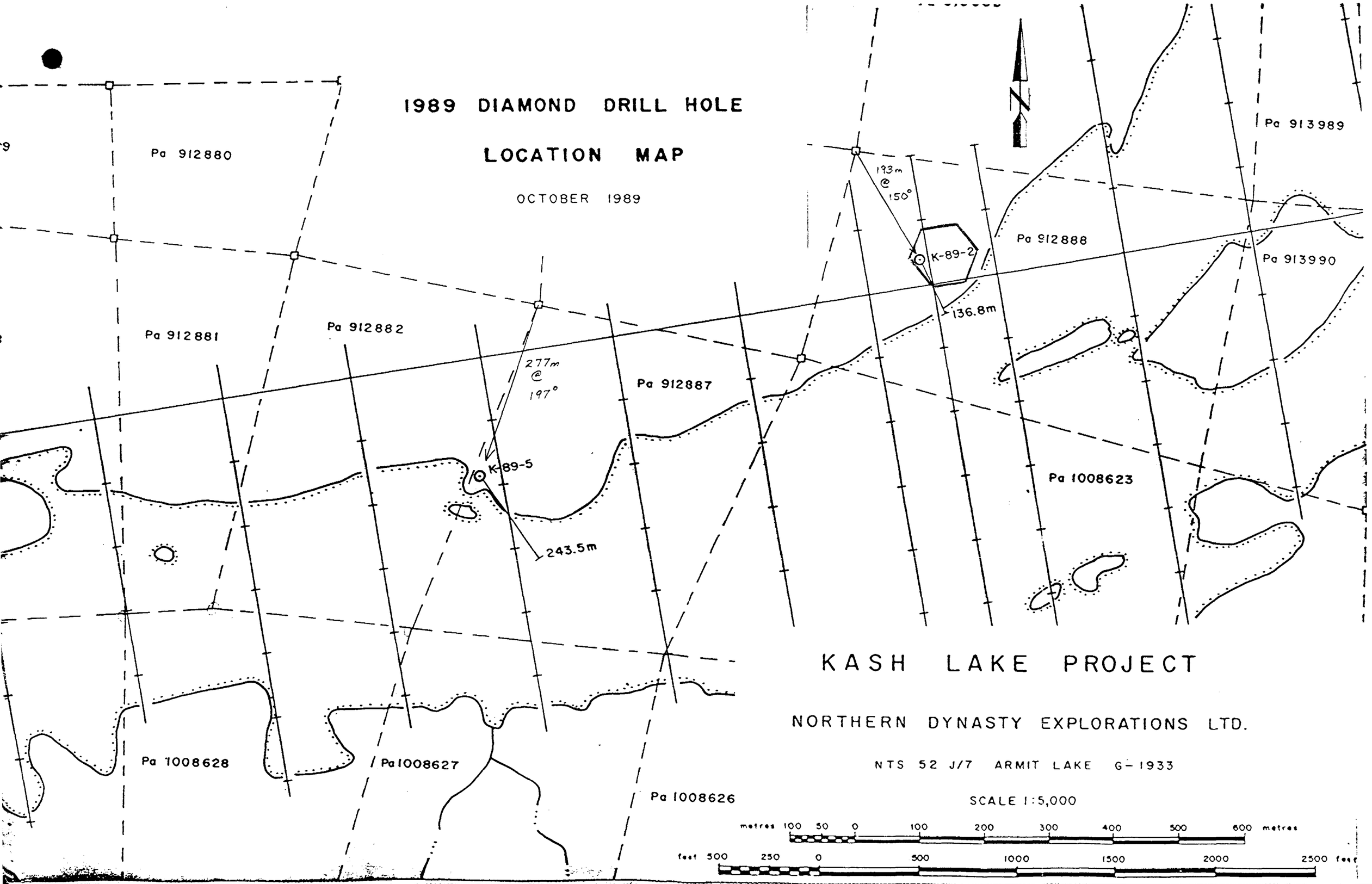
COLLAR:	HOLE SURVEY		
NORTH	FOOTAGE	AZIMUTH	DIP
EAST			
ELEVATION			
LOGGED BY			
DATE LOGGED			
MAP REFERENCE NO.	METHOD:		

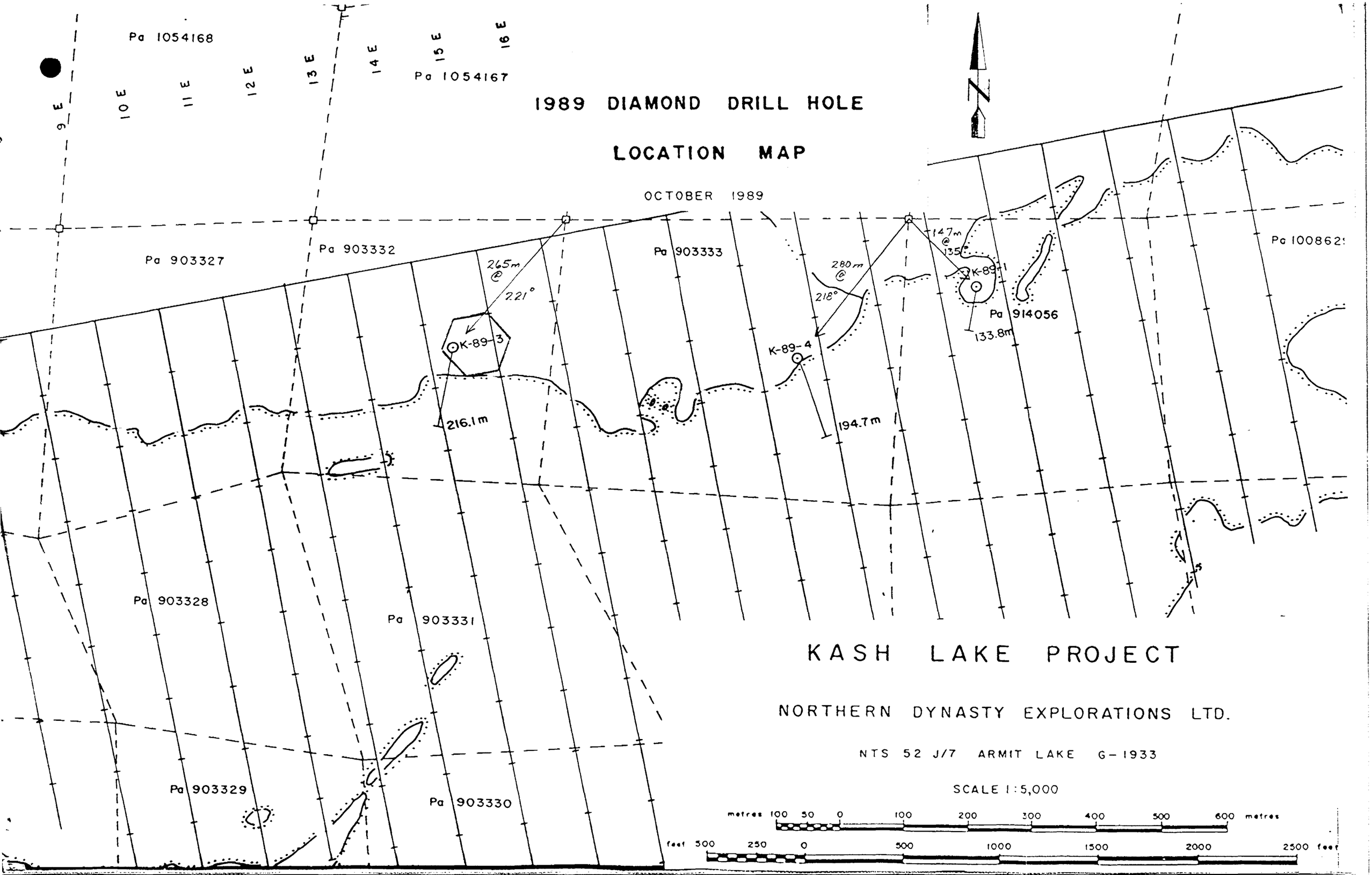
COMPANY NAME Northern Dynasty Explorations Ltd.
PROPERTY NAME Kash (Kashameqamak) Lake / Savant Lake Area
DRILLING CONTRACTOR Langley Drilling / Brampton, Ont.
ASSAYER Acme Analytical Laboratories Ltd.
PURPOSE OF HOLE

HOLE NO. K-89-05
CLAIM NAME
COMMENCED
FINISHED
PROJECT NO.

FROM	TO	RECOVY	DESCRIPTION	SAMPLE FROM	SAMPLE TO	SAMPLE WIDTH	SAMPLE NO.	ASSAYS						
243.8	—		E.O.H.											
			Notes: Casing Pulled											


1989 DIAMOND DRILL HOLE
LOCATION MAP
OCTOBER 1989
N
Pa 1054168
Pa 1054167
9 E
10 E
11 E
12 E
13 E
14 E
15 E
16 E
Pa 903327
Pa 903332
Pa 903333
Pa 1008625
Pa 903328
Pa 903331
Pa 903329
Pa 903330
Pa 914056
265m @ 221°
K-89-3
216.1m
280m @ 218°
K-89-4
194.7m
147m @ 135
K-89-1
133.8m
KASH LAKE PROJECT
NORTHERN DYNASTY EXPLORATIONS LTD.
NTS 52 J/7 ARMIT LAKE G-1933
SCALE 1:5,000
metres 100 50 0 100 200 300 400 500 600 metres
feet 500 250 0 500 1000 1500 2000 2500 feet


1989 DIAMOND DRILL HOLE
LOCATION MAP
OCTOBER 1989
Pa 912880
Pa 912881
Pa 912882
Pa 912887
Pa 912888
Pa 913989
Pa 913990
Pa 1008623
Pa 1008628
Pa 1008627
Pa 1008626
193m @ 150°
K-89-2
136.8m
277m @ 197°
K-89-5
243.5m
N
KASH LAKE PROJECT
NORTHERN DYNASTY EXPLORATIONS LTD.
NTS 52 J/7 ARMIT LAKE G-1933
SCALE 1:5,000
metres 100 50 0 100 200 300 400 500 600 metres
feet 500 250 0 500 1000 1500 2000 2500 feet


1989 DIAMOND DRILL HOLE
LOCATION MAP
OCTOBER 1989
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NORTHERN DYNASTY EXPLORATIONS LTD.
NTS 52 J/7 ARMIT LAKE G-1933
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Pa 1054168
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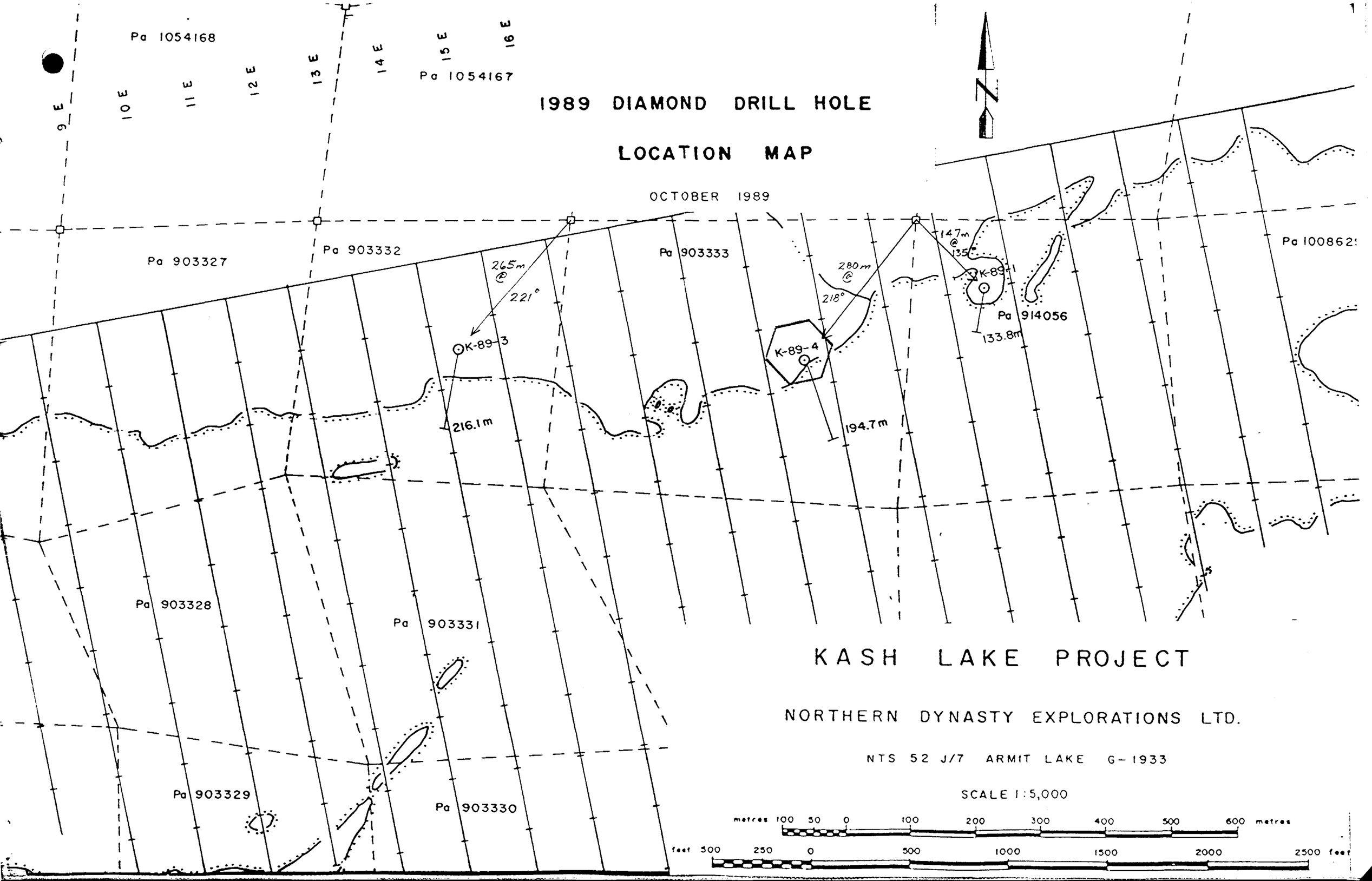
metres 100 50 0 100 200 300 400 500 600 metres
feet 500 250 0 500 1000 1500 2000 2500 feet


1989 DIAMOND DRILL HOLE
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OCTOBER 1989
KASH LAKE PROJECT
NORTHERN DYNASTY EXPLORATIONS LTD.
NTS 52 J/7 ARMIT LAKE G-1933
SCALE 1:5,000
Pa 1054168
Pa 1054167
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9 E
10 E
11 E
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265m @ 221°
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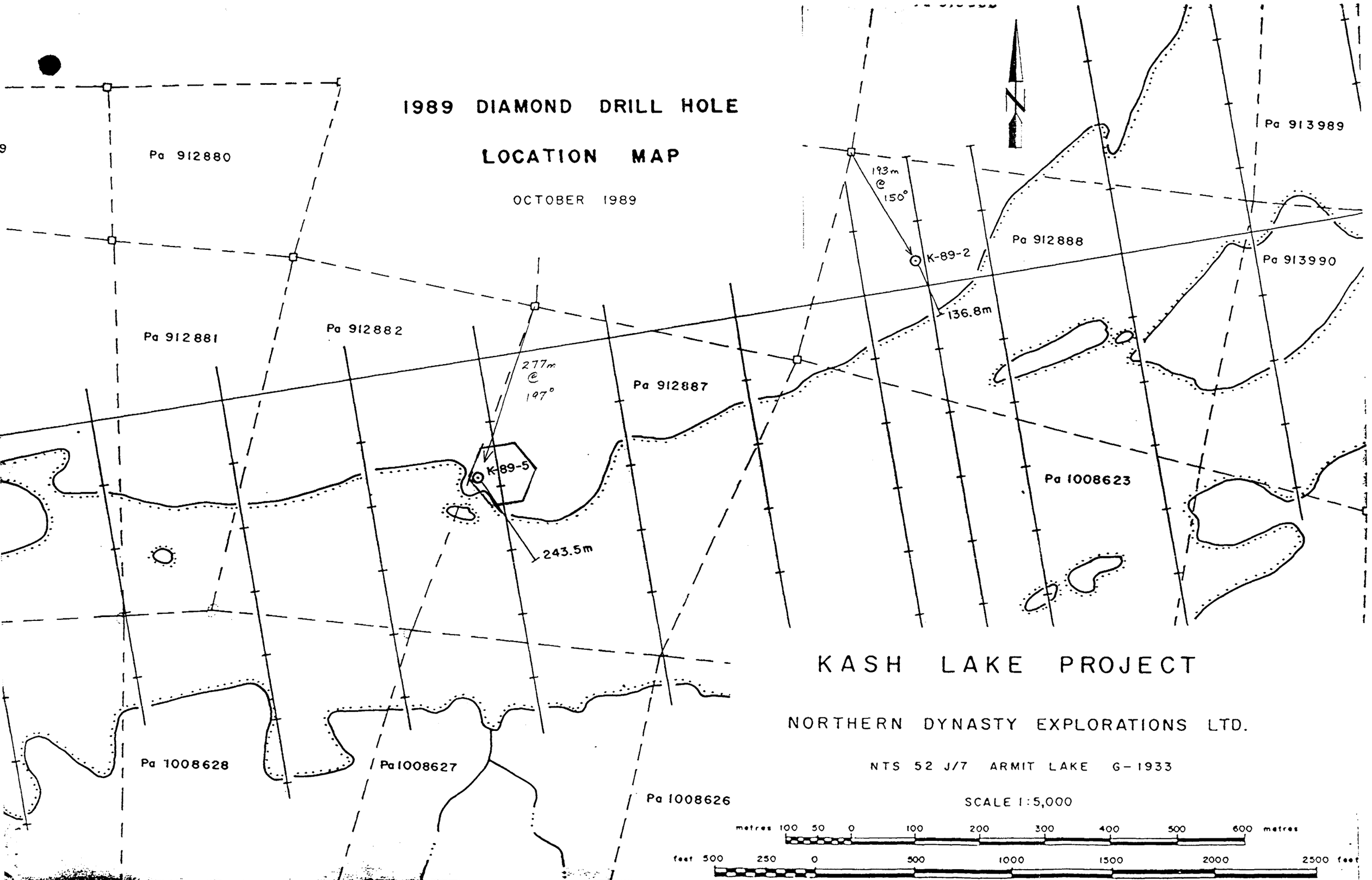
metres 100 50 0 100 200 300 400 500 600 metres
feet 500 250 0 500 1000 1500 2000 2500 feet


1989 DIAMOND DRILL HOLE
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OCTOBER 1989
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Pa 912882
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Pa 913989
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193m @ 150°
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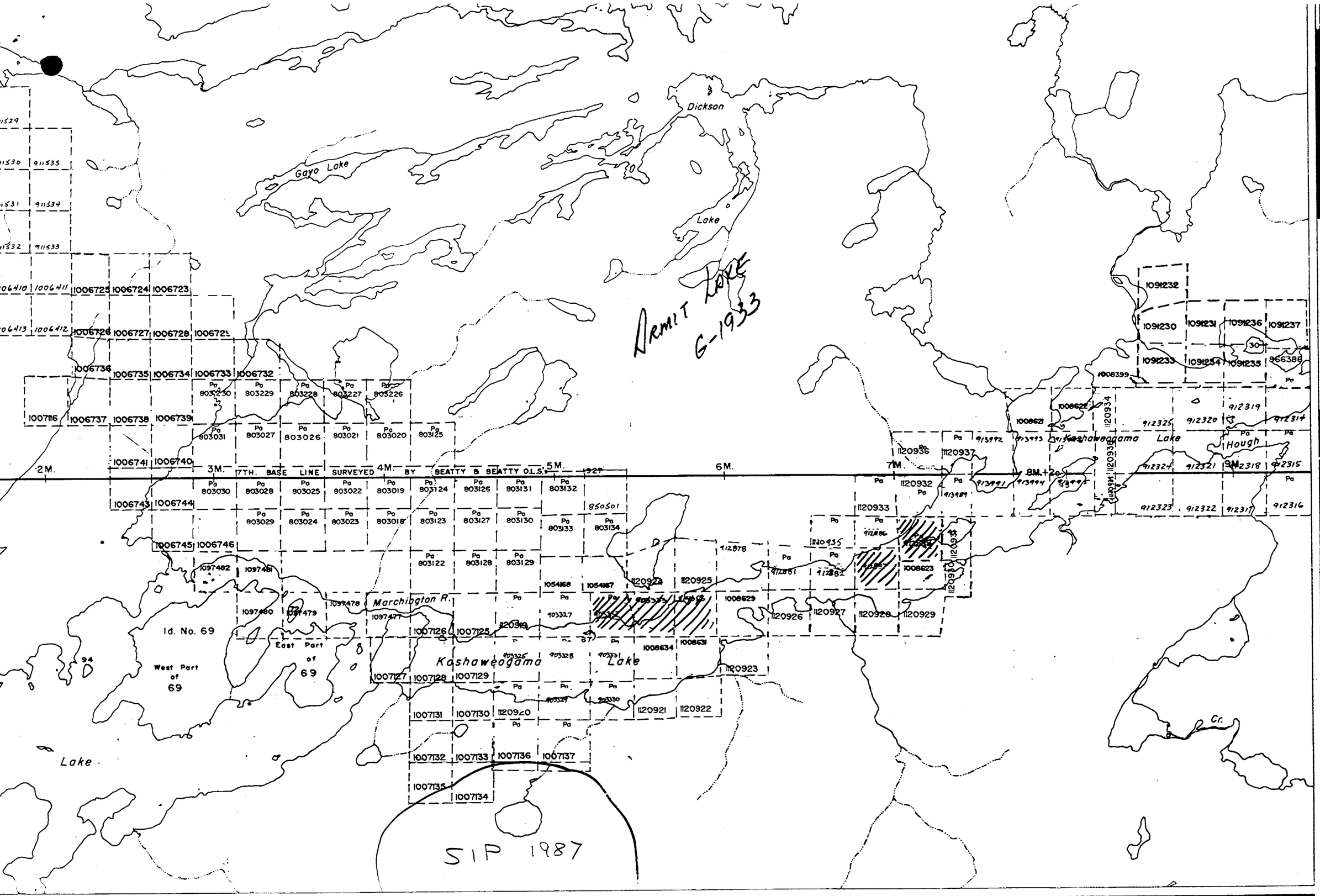
KASH LAKE PROJECT
NORTHERN DYNASTY EXPLORATIONS LTD.
NTS 52 J/7 ARMIT LAKE G-1933
SCALE 1:5,000
metres 100 50 0 100 200 300 400 500 600 metres
feet 500 250 0 500 1000 1500 2000 2500 feet

NORTHERN DYNASTY EXPLORATIONS

1989 KASH LAKE PROPERTY / DRILL CREDIT SUBMISSION
ARMIT LAKE - 6/1933

CLAIM	WORK CREDITS APPLIED		CLAIM #	WORK CREDITS APPLIED
Pa. 903327	121.22		1008629	130.9
903328	140.0		1054167	60.0
903331	30.9		1054168	60.0
903332	96.22		1120925	200.0
903333	106.22		1120926	2.4
912878	127.7		1120932	200.0
912881	98.7		1120935	200.0
912882	106.22			
912886	121.22			
912887	112.7			
914888	92.7			
913989	130.9		TOTAL	3036
913991	112.7		36 claims	
913992	130.9			
914056	130.9			
1006723	32.7			
1006724	40.0			
1006725	40.0			
1006726	40.0			
1006727	32.7			
1006728	40.0			
1006729	40.0			
1006732	40.0			
1006733	32.7			
1006734	32.7			
1006735	32.7			
1006736	40.0			
1006738	40.0			
1006739	40.0			

RECEIVED
OCT 27 1989
PATRICIA MINING DIVISION


GREBE LAKE AREA - G-2053
Dickson
Lake
Gayo Lake
Armit Lake
G-1933
7TH. BASE LINE SURVEYED BY BEATTY & BEATTY O.L.S. 1927
2M.
3M.
4M.
5M.
6M.
7M.
8M.
Marchington R.
Kashaweogama Lake
Kashaweogama Lake
Hough
Id. No. 69
West Part of 69
East Part of 69
Lake
Cr.
SIP 1987
27'
26'
25'
24'
23'
30°22'30"

Ministry of Natural Resources
Ontario

Report of Work

DOCUMENT No. W8903.152
Mir

Assess Lib

52J07NW0007 17 ARMIT LAKE

900

Name and Address of Recorded Holder

NORTHERN DYNASTY EXPLORATIONS Ltd. | T-1884

844 W. Hastings, VANCOUVER, B.C. V6C-1C8

Summary of Work Performance and Distribution of Credits ARMIT LAKE G-1933

Total Work Days Cr. claimed	Mining Claim Prefix	Mining Claim Number	Work Days Cr.	Mining Claim Prefix	Mining Claim Number	Work Days Cr.	Mining Claim Prefix	Mining Claim Number	Work Days Cr.
3036	— SEE ATTACHED SHEET —								

for Performance of the following work. (Check one only)

- ☐ Manual Work
- ☐ Shaft Sinking Drifting or other Lateral Work.
- ☐ Compressed Air, other Power driven or mechanical equip.
- ☐ Power Stripping
- ☒ Diamond or other Core drilling
- ☐ Land Survey

ONTARIO GEOLOGICAL SURVEY ASSESSMENT OFFICE NOV 02 RECEIVED

All the work was performed on Mining Claim(s): PR 903332, 903333, 912887, 912888, 914056

Required Information eg: type of equipment, Names, Addresses, etc. (See Table Below)

KASH LAKE DRILL PROGRAM — 1989

CONTRACTOR: LANGLEY DRILLING, 49 JAYFIELD ROAD BRAMPTON, ONTARIO V6S 3G3

Geologists: DARREN ELSBY, PETER DOYLE

CREDITS: 3036 FEET OF DRILLING (DDH K-89-01 → 05) = 3036 CREDITS

WORK SKETCHES AND DRILL LOGS ATTACHED

DIAMETER OF CORE: BQ

DATES OF OPERATION: 03 SEPTEMBER — 17 SEPTEMBER, 1989

RECEIVED OCT 27 1989 PATRICIA MINING DIVISION

Date of Report	Recorded Holder or Agent (Signature)
24 October 1989	Darren C. Elsby

Certification Verifying Report of Work

I hereby certify that I have a personal and intimate knowledge of the facts set forth in the Report of Work annexed hereto, having performed the work or witnessed same during and/or after its completion and the annexed report is true.

Name and Postal Address of Person Certifying

DARREN C. ELSBY 844 W. Hastings street

VANCOUVER, B.C. V6C-1C8

Date Certified	Certified by (Signature)
24 October 1989	Darren C. Elsby

Table of Information/Attachments Required by the Mining Recorder

Type of Work	Specific information per type	Other information (Common to 2 or more types)	Attachments
Manual Work	Nil	Names and addresses of men who performed manual work/operated equipment, together with dates and hours of employment.	Work Sketch: these are required to show the location and extent of work in relation to the nearest claim post.
Shaft Sinking, Drifting or other Lateral Work			
Compressed air, other power driven or mechanical equip.	Type of equipment		
Power Stripping	Type of equipment and amount expended. Note: Proof of actual cost must be submitted within 30 days of recording.	Names and addresses of owner or operator together with dates when drilling/stripping done.	
Diamond or other core drilling	Signed core log showing; footage, diameter of core, number and angles of holes.		Work Sketch (as above) in duplicate
Land Survey	Name and address of Ontario land surveyor.	Nil	Nil

768 (81/3)