

Hole Number: ES2005-22

Units: METRIC

Project Name: Norway - Espedalen	Primary Coordinates Grid: UTM84-32N	Destination Coordinates Grid: UTM:	Collar Dip: -43.65
Project Number: 201	North: 6801284.50	North: 61.34	Collar Az: 233.20
Location: Surface	East: 535113.20	East: 9.66	Length: 77.75 (m)
	Elev: 983.15	Elev: 983.15	Start Depth: 0.00 (m)
Date Started: Mar 14, 2005	Collar Survey: Y	Plugged: N	Contractor: Arctic Drilling A/S
Date Completed: Mar 18, 2005	Multishot Survey: Y	Hole Size: TT46	Core Storage: Strand Fjellstue
Logged By: Patti Tirschmann	Pulse EM Survey: Y	Casing: Left in Hole, capped	Final Depth: 77.75 (m)

Comments: Purpose: Test 22m up-dip toe on mineralization intersected in hole ES2004-08 (2.07% Ni, 1.20%Cu, 0.07%Co / 2.70m (56.30-59.00m)).

Result: Intersected massive sulphide (po-pn-cpy) vein within an anorthosite from 29.35-29.90m (0.55m), followed downhole by a well mineralized ultramafic (30-50% net textured po-pn-cpy) from 31.35m-35.02m (3.67m).

Assays: 3.29%Ni, 1.52%Cu, 0.10%Co / 5.67m (29.35-35.02m)

Borehole UTEM: Predominantly in-hole response (27m) with a small edge response @ 35m. Correlates with intersected mineralization.

Sample Averages

Average Type	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
WEIGHTED	29.35	35.02	5.67	3.2914	1.5195	0.1019
WEIGHTED	29.35	36.50	7.15	2.6805	1.2650	0.0829
WEIGHTED	31.35	35.02	3.67	3.8548	1.9471	0.1205

Survey Data

Depth (m)	Azimuth Decimal	Dip Decimal	Test Type	Flag	Comments	Depth (m)	Azimuth Decimal	Dip Decimal	Test Type	Flag	Comments
0.00	233.20	-43.65	MShot	OK		5.00	233.20	-43.36	MShot	OK	
10.00	232.83	-43.35	MShot	OK		15.00	232.73	-43.30	MShot	OK	
20.00	232.67	-43.20	MShot	OK		25.00	232.67	-43.26	MShot	OK	
30.00	232.67	-43.24	MShot	OK		35.00	232.51	-43.18	MShot	OK	
40.00	232.15	-43.18	MShot	OK		45.00	231.86	-43.15	MShot	OK	
50.00	231.87	-43.27	MShot	OK		55.00	232.10	-43.38	MShot	OK	
60.00	232.47	-43.55	MShot	OK		65.00	232.62	-43.57	MShot	OK	
70.00	233.29	-43.72	MShot	OK		75.00	233.50	-43.80	MShot	OK	

Detailed Lithology		Assay Data							
From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
0	3.70	C, Casing RQD 3.00 - 3.70 : 0.00 % RQD 100.00 % Core Casing							

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From (m)	To (m)		Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
3.70	29.35	4s, Sausseritized/Tectonized Anorthosite	PG03796	27.65	28.50	0.85	0.0250	0.0250	0.0100
		Inhomogeneous, mottled white and pale green, weakly tectonized and weakly to moderately sericitized, coarse grained anorthosite. Consists of approximately 75-80% plagioclase, 5-15% pale green sercite, 5-10% quartz and trace bright green, fine grained mica (fuchsite?). Quartz occurs as patches (mobilize?), fracture fillings and veinlets. Unit contains a) 5% cm to dm scale intervals of bluish grey UM schist containing trace to 2% pyrite (esp. between 20 and 23m) and b) 3-5% dark green/grey serpentine (?) fracture fillings, possibly due to proximity to UM. Sericitization increases significantly downhole of 23m towards mineralized zone.	PG03797	28.50	29.35	0.85	0.0250	0.0250	0.0100
		Magnetic susceptibility: typically <0.1.							
		Alteration							
		23.00 - 29.35 :SE Sericite, P Pervasive, M Moderate							
		Structure							
		18.70 - 18.71 : Sm General Foliation, 70 Deg to CA							
		25.80 - 25.81 : Sm General Foliation, 50 Deg to CA							
		27.50 - 27.51 : Sm General Foliation, 55 Deg to CA							
		RQD							
		3.70 - 6.00 : 30.00 % RQD 100.00 % Core							
		Fractured and badly broken 4.5-6.0m							
		6.00 - 9.00 : 74.00 % RQD 100.00 % Core							
		9.00 - 12.00 : 86.00 % RQD 100.00 % Core							
		12.00 - 15.00 : 84.00 % RQD 100.00 % Core							
		15.00 - 18.00 : 92.00 % RQD 100.00 % Core							
		18.00 - 21.00 : 85.00 % RQD 100.00 % Core							
		21.00 - 24.00 : 76.00 % RQD 100.00 % Core							
		24.00 - 27.00 : 83.00 % RQD 100.00 % Core							
		27.00 - 30.00 : 90.00 % RQD 100.00 % Core							
		MINOR INTERVALS:							
		Minor Interval:							
		4.5 - 5.1 MD, Mafic Dike							
		Fine grained, green mafic dyke. Rusty fractures and broken core near top of hole.							

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
29.35	29.90	<p>MS, Massive Sulphide</p> <p>Massive sulphide consisting of 85-90% pyrrhotite, 5-7% pentlandite, 3% chalcopyrite and 3% gangue (UM clasts). Pentlandite occurs as 1-5mm diameter rounded "eyes" distributed throughout. Chalcopyrite is fine grained and intermixed with pyrrhotite "groundmass". Interval is weakly foliated.</p> <p>Uphole contact slightly ground; downhole contact sharp at 50° to CA.</p> <p>Magnetic susceptibility: 26-47 Conductivity: 1200-1650 siemens</p> <p>Mineralization 29.35 - 29.90 : Cpy Chalcopyrite, D Disseminated, 3% 29.35 - 29.90 : Pn Pentlandite, EY Eyes, 6% 29.35 - 29.90 : Po Pyrrhotite, M Massive, 85%</p> <p>Structure 29.45 - 29.46 : Sm General Foliation, 50 Deg to CA</p>	PG03798	29.35	29.90	0.55	7.5500	1.3800	0.2200
29.90	31.35	<p>4s, Sausseritized/Tectonized Anorthosite</p> <p>Inhomogeneous, yellowish altered anorthosite, locally with brecciated appearance due to alteration. Interval contains sulphide stringers subparallel to CA between 30.2-30.4m, consisting of pyrrhotite with minor pentlandite and chalcopyrite.</p> <p>Anorthosite is likely a block within mineralized zone as it is bounded uphole by MS and downhole by well mineralized UM.</p> <p>Mineralization 30.20 - 30.40 : Cpy Chalcopyrite, D Disseminated, 3% 30.20 - 30.40 : Pn Pentlandite, D Disseminated, 1% 30.20 - 30.40 : Po Pyrrhotite, STR Stringers, 25% Pyrrhotite stringer with 3% cpy and 1-2% pn</p> <p>RQD 30.00 - 33.00 : 74.00 % RQD 100.00 % Core</p>	PG03799	29.90	31.35	1.45	0.2500	0.4900	0.0100

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Detailed Lithology		Lithology	Assay Data						
From (m)	To (m)		Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
31.35	35.02	6, Undivided Ultramafic Intrusive Well mineralized ultramafic intrusion (dyke?). 31.35-32.20m: Inhomogeneous interval consisting of 55% sulphide (40% po, 8-10% pn, 5-7% cp), and 45% UM. One 25cm long vein of massive remobilized sulphide occurs near uphole contact, followed by sulphide stringers and semi-massive sulphides. Pentlandite in MS vein occurs as 1-3mm "eyes", 1-2mm wide laminae and fine flecks. 32.20-35.02m: Homogeneous interval consisting of 25-30% net-textured sulphides surrounding 70-75% dark green ultramafic "clasts" ranging in size from 1mm-30mm. 1-2% carbonate alteration in groundmass and along fractures. Unit has a brecciated appearance likely due to tectonization superimposed on original net-textured mineralized UM. Sulphides include 20-25% pyrrhotite, 3% chalcopyrite, 2-3% pentlandite and trace pyrite. Chalcopyrite occurs as network of fine fracture fillings. Ultramafic has irregular uphole contact marked by 25cm long vein of remobilized massive sulphide from 31.45-31.70m. Downhole contact with mafic dyke is sharp and at 80° to CA. Ultramafic is unmineralized for approx. 6cm immediately adjacent to downhole contact. Weak foliation estimated at 60° to CA. Magnetic susceptibility: 18-75, avg = 50 Conductivity: 400-1300, avg = 1000 Mineralization 31.35 - 32.20 : Cpy Chalcopyrite, D Disseminated, 5% 31.35 - 32.20 : Pn Pentlandite, EY Eyes, 9% 31.35 - 32.20 : Po Pyrrhotite, SM Semi-Massive, 40% Interval contains one 25cm long MS vein as well as SMS and sulphide stringers (40% po, 8-10% pn, 5-7% cp) 32.20 - 35.02 : Cpy Chalcopyrite, F Fracture Controlled, 3% CP fills fine network of fractures 32.20 - 35.02 : Pn Pentlandite, EY Eyes, 2% 32.20 - 35.02 : Po Pyrrhotite, NT Net-Textured, 25% Interval contains 25-30% net-text sulphides incl. 20-25% po, 3% cp, 2-3%pn, tr py Alteration 32.20 - 35.02 :CB Carbonate, D Disseminated, W Weak 2-3% carbonate alteration, disseminated in groundmass and along narrow fractures Structure 34.00 - 34.01 : Sm General Foliation, 60 Deg to CA RQD 33.00 - 36.00 : 90.00 % RQD 100.00 % Core	PG03801	31.35	32.20	0.85	3.7200	2.6400	0.1200
			PG03802	32.20	33.00	0.80	3.3400	2.4300	0.1100
			PG03803	33.00	34.00	1.00	4.0700	1.5400	0.1300
			PG03804	34.00	35.02	1.02	4.1600	1.3900	0.1200

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From (m)	To (m)		Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
35.02	36.50	MD, Mafic Dike Fine grained green mafic dyke. One narrow interval (inclusion?) of mineralized UM between 35.3m and 35.47m containing 5% po-cp-pn. Magnetic susceptibility: 0.15-0.7 Mineralization 35.30 - 35.47 : Cpy Chalcopyrite, D Disseminated, 1% 35.30 - 35.47 : Pn Pentlandite, D Disseminated, 1% 35.30 - 35.47 : Po Pyrrhotite, BB Blebby, 5% 5% po-cp-pn in UM inclusion RQD 36.00 - 39.00 : 69.00 % RQD 100.00 % Core Broken: 38-39m	PG03805	35.02	36.50	1.48	0.3400	0.2900	0.0100
36.50	38.15	PYXT, Pyroxenite Fine to medium grained blueish green phlogopite-bearing pyroxenite (?) consisting of pyroxene and serpentine with 3-10% dark brown phlogopite grains and clots up to several mms in diameter. Uphole contact with mafic dyke sharp at 60° to CA; downhole contact with anorthosite estimated at 50-55° to CA but apophyses of UM appear to extend downhole into anorthosite. Magnetic susceptibility: 0.2	PG03806	36.50	37.50	1.00	0.1300	0.1000	0.0100
			PG03807	37.50	38.15	0.65	0.1000	0.0600	0.0100

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
38.15	77.75	<p>4s, Sausseritized/Tectonized Anorthosite</p> <p>Mottled to striped green and white tectonized and sericitized anorthosite. Similar to uphole, consisting of 80-85% white plagioclase, 10-15% pale green sericite, 1-5% quartz and trace fuchsite. Unit contains a) 5-10% cm scale mafic and ultramafic "bands" (former dykes?) now aligned parallel to shearing and foliation and b) 5% mm scale dark grey amorphous serpentine veinlets and fracture fillings.</p> <p>Weakly to moderately sheared imparting striped or banded appearance to unit. Fracture-controlled to patchy hematization locally (eg. 42.25-42.55m, 49.5-49.6m, 57.25-62.70m). 1-20mm wide pale pink feldspar veinlets locally (eg. 49.55m-50.5m, 53.20m, 59.2-59.3m).</p> <p>Magnetic susceptibility: typically < 0.20.</p> <p>Alteration 42.25 - 62.70 :HM Hematite, F Fracture Controlled, M Moderate 5-7% fracture-controlled to patchy hematization</p> <p>Structure 41.40 - 41.41 : Sm General Foliation, 60 Deg to CA 51.00 - 51.01 : Sm General Foliation, 60 Deg to CA 64.00 - 64.01 : Sm General Foliation, 60 Deg to CA 77.20 - 77.21 : Sm General Foliation, 65 Deg to CA</p> <p>RQD 39.00 - 42.00 : 33.00 % RQD 100.00 % Core Broken: 39.35-40.7m 42.00 - 45.00 : 67.00 % RQD 100.00 % Core Broken: 42.25-42.50m 45.00 - 48.00 : 92.00 % RQD 100.00 % Core 48.00 - 51.00 : 79.00 % RQD 100.00 % Core 51.00 - 54.00 : 87.00 % RQD 100.00 % Core 54.00 - 57.00 : 80.00 % RQD 100.00 % Core 57.00 - 60.00 : 68.00 % RQD 100.00 % Core Hematized and broken @ 58.4m 60.00 - 63.00 : 84.00 % RQD 100.00 % Core 63.00 - 66.00 : 81.00 % RQD 100.00 % Core 66.00 - 69.00 : 63.00 % RQD 100.00 % Core 69.00 - 72.00 : 74.00 % RQD 100.00 % Core 72.00 - 75.00 : 79.00 % RQD 100.00 % Core 75.00 - 77.75 : 83.00 % RQD 100.00 % Core</p>							

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Samples

Sample Number	From (m)	To (m)	Ni%	Cu%	Co%
Sample Type	ASSAY				
PG03796	27.65	28.50	0.0250	0.0250	0.0100
PG03797	28.50	29.35	0.0250	0.0250	0.0100
PG03798	29.35	29.90	7.5500	1.3800	0.2200
PG03799	29.90	31.35	0.2500	0.4900	0.0100
PG03801	31.35	32.20	3.7200	2.6400	0.1200
PG03802	32.20	33.00	3.3400	2.4300	0.1100
PG03803	33.00	34.00	4.0700	1.5400	0.1300
PG03804	34.00	35.02	4.1600	1.3900	0.1200
PG03805	35.02	36.50	0.3400	0.2900	0.0100
PG03806	36.50	37.50	0.1300	0.1000	0.0100
PG03807	37.50	38.15	0.1000	0.0600	0.0100