

Hole Number: ES2004-14

Units: METRIC

Project Name:	Norway - Espedalen	Primary Coordinates	Grid: UTM84-32N	Destination Coordinates	Grid: UTM:	Collar Dip:	-54.00
Project Number:	201	North:	6809492.84	North:	61.42	Collar Az:	231.00
Location:	Surface	East:	532762.13	East:	9.61	Length:	131.45 (m)
		Elev:	1284.42	Elev:	1284.42	Start Depth:	0.00 (m)
Date Started:	Sep 15, 2004	Collar Survey:	Y	Plugged:	N	Contractor:	Geo Drilling A/S
Date Completed:	Sep 19, 2004	Multishot Survey:	N	Hole Size:	TT46	Core Storage:	Strand Fjellstue
Logged By:	P. Tirschmann	Pulse EM Survey:	N	Casing:	Left in Hole, capped	Final Depth:	131.45 (m)

Comments: Purpose: To test UTEM conductor ESP_10_08. Conductivity = 400 siemens.

Result: Mineralized pyroxenite was intersected from 50.85m-81.60m, which contains an average of 2-10% pyrrhotite with trace pyrite and chalcopyrite. Sulphides typically occur as blebs and disseminations. Two narrow intervals containing net-textured to semi-massive sulphides from 79.60-80.60m and 81.15-81.60m.

Assays: 0.66% Ni, 0.37% Cu, 0.06% Co / 1.00m (79.60-80.60m)
0.99% Ni, 0.10% Cu, 0.08% Co / 0.45m (81.15-81.60m)

Borehole UTEM: Survey to be conducted in November 2005.

Lithological interpretation: Package of norites and pyroxenites which have intruded what appear to be siliceous metasediments. Mafic/ultramafic rocks locally cross-cut by distinctive magnetic mafic alkaline (?) dykes.

Sample Averages

Average Type	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
WEIGHTED	79.60	81.60	2.00	0.5693	0.2598	0.0508
WEIGHTED	97.00	99.00	2.00	0.2400	0.1200	0.0200

Detailed Lithology			Assay Data						
From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
0	2.35	C, Casing CASING							

Hole Number: ES2004-14

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Detailed Lithology		Lithology	Assay Data						
From (m)	To (m)		Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
2.35	19.95	<p>6f, Norite</p> <p>Medium grained, greyish to brownish green, equigranular norite. Consists of 75-85% pyroxene, 15-25% plagioclase, 3-5% biotite ± chlorite and trace pyrrhotite. Pyroxene is brownish in color and appears altered. Norite is in sharp contact with one interval of pyroxenite (see minor interval) and is also gradational to pyroxenite adjacent to downhole contact with ultramafic dyke (18.6-19.95m).</p> <p>Conductivity: Non-conductive Magnetic susceptibility: 0.3-1.5</p> <p>NOTE: Whole rock analysis of dyke rocks</p> <p>RQD</p> <p>2.35 - 5.00 : 43.00 % RQD 100.00 % Core 5.00 - 8.00 : 62.00 % RQD 100.00 % Core 8.00 - 11.00 : 83.00 % RQD 99.00 % Core 11.00 - 14.00 : 85.00 % RQD 100.00 % Core 14.00 - 17.00 : 58.00 % RQD 100.00 % Core 17.00 - 20.00 : 55.00 % RQD 100.00 % Core</p> <p>MINOR INTERVALS: Minor Interval: 9.45 - 14 PYXT, Pyroxenite</p> <p>Medium grained, dark green pyroxenite locally containing trace to 1% pyrrhotite blebs and disseminations. Uphole contact sharp at 25-30° to CA; downhole contact sharp at 75-85° to CA.</p> <p>Non-conductive. Magnetic susceptibility: 3-12, avg = 5</p>							

DETAILED LOG

Hole Number: ES2004-14

Units: METRIC

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
19.95	22.30	<p>8f, Aphanitic UM Dyke</p> <p>Dark grey to black, magnetic aphanitic ultramafic (?) dyke. No visible leucocratic minerals. Contains 10-20% 1-3mm white diffuse rounded patches for several cms adjacent to both uphole and downhole contacts (alteration mineral or result of chilling?).</p> <p>Up hole contact is sharp and slightly irregular at 65° to CA; donwhole contact is sharp and chilled at 65° to CA. Clearly cross-cuts and postdates host norite.</p> <p>Conductivity: Non-conductive Magnetic Susceptibility: 10-32</p> <p>NOTE: A whole rock analysis from a a similar dyke in hole ES2004-16 yielded a composition similar to an alkaline olivine basalt suggesting this these dykes are mafic (versus ultramafic) with alkaline affinities.</p> <p>RQD 20.00 - 23.00 : 65.00 % RQD 100.00 % Core</p>							

Hole Number: ES2004-14

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
22.30	50.85	<p>6f, Norite</p> <p>As 2.35-19.95m. Medium grained, greyish to brownish green, equigranular norite. Consists of 75-85% pyroxene, 15-25% plagioclase and 3-5% biotite ± chlorite. Pyroxene is brownish in color and appears altered. Locally norite contains plagioclase rich bands, patches and veinlets which may represent partially digested or remobilized anorthositic material. Norite is in sharp to gradational contact with narrow intervals of pyroxenite (see minor intervals). Downhole contact with larger pyroxenite unit sharp and at 70° to CA.</p> <p>Conductivity: Non-conductive Magnetic susceptibility: 0.2-2, typically < 1.</p> <p>Interpretation: Part of same norite body as uphole, cross-cut by the distinctive aphanitic UM dyke. Likely magmatically related to UM units intersected in hole.</p> <p>RQD</p> <p>23.00 - 26.00 : 77.00 % RQD 100.00 % Core 26.00 - 29.00 : 68.00 % RQD 100.00 % Core 29.00 - 32.00 : 86.00 % RQD 100.00 % Core 32.00 - 35.00 : 64.00 % RQD 99.00 % Core 35.00 - 38.00 : 75.00 % RQD 100.00 % Core 38.00 - 41.00 : 77.00 % RQD 100.00 % Core 41.00 - 44.00 : 70.00 % RQD 100.00 % Core 44.00 - 47.00 : 81.00 % RQD 100.00 % Core 47.00 - 50.00 : 70.00 % RQD 100.00 % Core 50.00 - 53.00 : 65.00 % RQD 100.00 % Core</p> <p>MINOR INTERVALS: Minor Interval: 32.5 - 33.7 PYXT, Pyroxenite Fine to medium grained, dark green pyroxenite. Uphole contact appears abrupt but not sharp; downhole contact is sharp and at 75° to CA. Magnetic susceptibility increases downhole from <1 to 25.</p>							

Hole Number: ES2004-14

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
50.85	81.60	PYXT, Pyroxenite	PG03114	60.10	61.00	0.90	0.1300	0.0700	0.0100
		Medium grained, light to dark green pyroxenite consisting of 80-95% altered (?) pyroxene, 1-15% fine grained chlorite and trace to 10% pyrrhotite. Pyrrhotite occurs as blebs and disseminations and is moderately magnetic. Rare trace chalcopyrite intermixed with pyrrhotite. Ultramafic contains several cm to decimeter scale inclusions of medium to coarse grained anorthosite and anorthositic gabbro (eg. 53.55-53.8m, 54.60m, 78.4-79.6m). Downhole contact interpreted at last occurrence of UM-hosted semi-massive sulphide. Mineralized contact zone contains several 5-8cm wide zones of fine grained, highly siliceous rock as well as one interval of fine grained gabbro-norite between 80.5 and 81m.	PG03115	61.00	61.75	0.75	0.1100	0.1100	0.0100
			PG03116	61.75	63.00	1.25	0.2000	0.0700	0.0100
			PG03117	63.00	64.00	1.00	0.1600	0.1100	0.0300
			PG03118	64.00	65.00	1.00	0.1900	0.1600	0.0200
			PG03119	65.00	66.00	1.00	0.1400	0.0600	0.0300
			PG03120	66.00	67.00	1.00	0.1700	0.0600	0.0300
			PG03121	67.00	68.00	1.00	0.1900	0.0700	0.0200
			PG03122	68.00	69.00	1.00	0.1600	0.0800	0.0200
			PG03123	69.00	70.00	1.00	0.1600	0.0700	0.0300
		Conductivity: Conductive where po mineralization is interconnected. Magnetic susceptibility: typical between 1 and 10; locally up to 33.	PG03124	70.00	71.00	1.00	0.1200	0.0600	0.0100
		Mineralization	PG03126	71.00	72.00	1.00	0.1300	0.0250	0.0100
		60.10 - 61.00 : Po Pyrrhotite, D Disseminated, 2%	PG03127	72.00	72.50	0.50	0.1300	0.0250	0.0300
		61.00 - 61.75 : Po Pyrrhotite, D Disseminated, 0.5%	PG03128	72.50	73.50	1.00	0.0500	0.0250	0.0100
		Trace po, poorly mineralized due to presence of anorthositic bands	PG03129	73.50	74.50	1.00	0.1400	0.1000	0.0100
		61.75 - 72.50 : Po Pyrrhotite, BB Blebby, 3%	PG03130	74.50	75.50	1.00	0.1100	0.0250	0.0100
		1-5% pyrrhotite blebs and disseminations	PG03131	75.50	76.50	1.00	0.1500	0.0800	0.0200
		72.50 - 73.50 : Po Pyrrhotite, D Disseminated, 0.5%	PG03132	76.50	77.50	1.00	0.1300	0.1300	0.0100
		Trace po, most of intervals consists of unmin. UM dykes	PG03133	77.50	78.40	0.90	0.2100	0.2200	0.0300
		73.50 - 78.40 : Po Pyrrhotite, BB Blebby, 5%	PG03134	78.40	79.60	1.20	0.0250	0.2000	0.0100
		Po blebs and disseminations throughout	PG03135	79.60	80.60	1.00	0.6600	0.3700	0.0600
		78.40 - 79.60 : Cpy Chalcopyrite, F Fracture Controlled, 0.5%	PG03136	80.60	81.15	0.55	0.0600	0.1900	0.0100
		Trace cp & po filling fracture	PG03137	81.15	81.60	0.45	0.9900	0.1000	0.0800
		79.60 - 80.60 : Cpy Chalcopyrite, F Fracture Controlled, 3%							
		CP concentrated in 7cm wide siliceous zone							
		79.60 - 80.60 : Po Pyrrhotite, NT Net-Textured, 20%							
		Net-textured to locally semi-massive; one 5cm wide zone of siliceous rock.							
		79.60 - 80.60 : Py Pyrite, D Disseminated, 2%							
		Intermixed with po.							
		80.60 - 81.15 : Py Pyrite, F Fracture Controlled, 1%							
		Very fine grained pyrite along fractures in fine grained norite							
		81.15 - 81.60 : Po Pyrrhotite, SM Semi-Massive, 30%							
		Breccia textures locally; interval includes 8cm wide siliceous zone							
		81.15 - 81.60 : Py Pyrite, D Disseminated, 5%							
		Intermixed with po							
		RQD							
		53.00 - 55.00 : 46.00 % RQD 100.00 % Core							
		55.00 - 58.00 : 62.00 % RQD 100.00 % Core							
		58.00 - 61.00 : 73.00 % RQD 100.00 % Core							
		61.00 - 64.00 : 57.00 % RQD 100.00 % Core							
		64.00 - 67.00 : 69.00 % RQD 100.00 % Core							
		67.00 - 70.00 : 77.00 % RQD 100.00 % Core							
		70.00 - 73.00 : 68.00 % RQD 100.00 % Core							

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
		RQD 73.00 - 76.00 : 86.00 % RQD 100.00 % Core 76.00 - 79.00 : 77.00 % RQD 100.00 % Core 79.00 - 82.00 : 69.00 % RQD 100.00 % Core MINOR INTERVALS: Minor Interval: 72.9 - 73 8f, Aphanitic UM Dyke Similar to 19.95-22.30m. Uphole contact @ 50° to CA; downhole contact at 55° to CA. Minor Interval: 73.05 - 73.5 8f, Aphanitic UM Dyke Strongly magnetic. Aphanitic black UM dyke as previously but containing mm to cm scale clasts of pyroxenite and mineralized pyroxenite. Uphole contact at 30° to CA; downhole contact @ 65-70° to CA. Conductivity: Magnetic Susceptibility: 24-30 Interpretation: Clearly post-dates and brecciates mineralized ultramafic. Magmatic relationship to pyroxenite unclear. Minor Interval: 78.4 - 79.6 4, Anorthosite / Anorthosite Gabbro Very coarse grained, mottled white and green anorthositic block in ultramafic. Unmineralized.							

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
81.60	87.90	FGN, Felsic Gneiss Inhomogenous interval of fine grained, foliated to banded siliceous metasediments consisting of variable amounts of quartz, feldspar, biotite, altered mafic minerals (?) ± garnet. 7cm wide zone of what appears to be well banded to laminated chert at 81.9m. Cm scale anorthositic bands locally. Remobilized po±py locally as disseminations and fracture fillings, including one 4cm wide semi-massive band at 84.2m. Conductivity: typically non-conductive, but strongly conductive over po mineralization. Magnetic Susceptibility: 0.6-3 Mineralization 84.10 - 85.00 : Po Pyrrhotite, SM Semi-Massive, 10% 8% po, 2% py mainly in one 4cm wide semi-massive band at 84.2m 85.90 - 86.40 : Po Pyrrhotite, F Fracture Controlled, 7% 5% po, 2% py along fractures & disseminated Structure 81.90 - 81.91 : Sm General Foliation, 65 Deg to CA 86.60 - 86.61 : Sm General Foliation, 60 Deg to CA RQD 82.00 - 85.00 : 66.00 % RQD 100.00 % Core 85.00 - 88.00 : 57.00 % RQD 100.00 % Core	PG03138	81.60	82.10	0.50	0.1500	0.1600	0.0200
			PG03139	82.10	83.00	0.90	0.0250	0.0700	0.0100
			PG03140	83.00	84.10	1.10	0.0250	0.0250	0.0100
			PG03141	84.10	85.00	0.90	0.2700	0.1300	0.0300
			PG03142	85.00	85.90	0.90	0.1800	0.1300	0.0200
			PG03143	85.90	86.40	0.50	0.3400	0.1700	0.0400
			PG03144	86.40	87.00	0.60	0.0250	0.2000	0.0100
87.90	100.20	PYXT, Pyroxenite Medium grained, foliated to massive, dark green pyroxenite consisting of 85-95% altered (?) pyroxene, 1-10% fine grained chlorite and 1% to 5% pyrrhotite. Pyrrhotite occurs as disseminations and blebs and is moderately magnetic. Conductivity: Conductive where po mineralization is interconnected. Magnetic susceptibility: 1-15, avg = 5 Mineralization 94.00 - 100.20 : Po Pyrrhotite, D Disseminated, 2% Structure 88.70 - 88.71 : Sm General Foliation, 60 Deg to CA 98.30 - 98.31 : Sm General Foliation, 60 Deg to CA RQD 88.00 - 91.00 : 70.00 % RQD 100.00 % Core 91.00 - 94.00 : 62.00 % RQD 100.00 % Core 94.00 - 97.00 : 63.00 % RQD 100.00 % Core 97.00 - 100.00 : 56.00 % RQD 100.00 % Core 100.00 - 103.00 : 62.00 % RQD 100.00 % Core	PG03145	94.00	95.00	1.00	0.1700	0.0600	0.0100
			PG03146	95.00	96.00	1.00	0.1300	0.0250	0.0200
			PG03147	96.00	97.00	1.00	0.1300	0.0900	0.0100
			PG03148	97.00	98.00	1.00	0.2100	0.1000	0.0200
			PG03149	98.00	99.00	1.00	0.2700	0.1400	0.0200
			PG03151	99.00	100.20	1.20	0.1600	0.0700	0.0100

Hole Number: ES2004-14

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From (m)	To (m)		Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
100.20	131.45	FGN, Felsic Gneiss Interval dominated by siliceous, garnet-bearing metasediments. 100.2-104.4m: Inhomogenous interval consisting of 60% fine grained, banded, grey siliceous metasediments and 40% medium grained anorthositic gabbro. Both rock types are garnet-bearing with the metasediments containing garnet-rich beds and the anorthositic gabbro containing medium to coarse grained recrystallized garnet. 104.4-113m: Fine grained, dark grey, massive to weakly foliated quartzo-feldspathic unit consisting of variably amounts of feldspar, mafic minerals, quartz, biotite, muscovite ± garnet. (Psammitic metasediments?). 113-131.4m: Fine grained, banded siliceous metasediments consisting of alternating grey siliceous beds and pink, more pelitic garnet-rich beds. Unit also contains cm to dm scale intervals of what appears to be coarser grained, massive garnet-bearing anorthosite (eg. 116.6-117.7m, 118.8-119.2m, 121.55-122.05m, 127.9-128.8m). Metasediments are cross-cut by several aphanitic, magnetic, black ultramafic dykes as follows: 113.3-113.75m: irregular uphole contact; downhole contact at 80° to CA 119.2-120.2m: uphole and downhole contacts at 10° to CA 125.6-127m: uphole contact at 65° to CA; downhole contact at 10° to CA 127.4-127.6m: uphole contact at 60° to CA; downhole contact at 50° to CA Aphanitic dykes typically contains rounded, diffuse white grains 1-3mm in diameter. In one dyke, these grains become much smaller and highly concentrated at the dyke contacts, possible due to effects of rapid cooling. Conductivity: Non-conductive. Magnetic susceptibility: 2-6 between 100.2 and 113m; typically < 2 between 113 and 131.4m (except for magnetic dykes which range from 9-18). Mineralization 123.90 - 124.20 : Po Pyrrhotite, STR Stringers, 10% Structure 100.90 - 100.91 : Sm General Foliation, 50 Deg to CA 114.80 - 114.81 : Sm General Foliation, 70 Deg to CA 122.60 - 122.61 : Sm General Foliation, 55 Deg to CA 129.50 - 129.51 : Sm General Foliation, 80 Deg to CA RQD 103.00 - 106.00 : 65.00 % RQD 100.00 % Core 106.00 - 109.00 : 67.00 % RQD 100.00 % Core 109.00 - 112.00 : 72.00 % RQD 100.00 % Core 112.00 - 115.00 : 64.00 % RQD 100.00 % Core 115.00 - 118.00 : 80.00 % RQD 100.00 % Core 118.00 - 121.00 : 65.00 % RQD 100.00 % Core 121.00 - 124.00 : 69.00 % RQD 100.00 % Core 124.00 - 127.00 : 70.00 % RQD 100.00 % Core	PG03152	123.90	124.20	0.30	0.0800	0.0600	0.0300

Hole Number: ES2004-14

Units: METRIC

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From (m)	To (m)	Lithology	Sample Number	From (m)	To (m)	Length (m)	Ni%	Cu%	Co%
		RQD 127.00 - 130.00 : 57.00 % RQD 100.00 % Core 130.00 - 131.45 : 83.00 % RQD 100.00 % Core 131.45m End of Hole							

Samples

Sample Number	From (m)	To (m)	Ni%	Cu%	Co%
Sample Type	ASSAY				
PG03114	60.10	61.00	0.1300	0.0700	0.0100
PG03115	61.00	61.75	0.1100	0.1100	0.0100
PG03116	61.75	63.00	0.2000	0.0700	0.0100
PG03117	63.00	64.00	0.1600	0.1100	0.0300
PG03118	64.00	65.00	0.1900	0.1600	0.0200
PG03119	65.00	66.00	0.1400	0.0600	0.0300
PG03120	66.00	67.00	0.1700	0.0600	0.0300
PG03121	67.00	68.00	0.1900	0.0700	0.0200
PG03122	68.00	69.00	0.1600	0.0800	0.0200
PG03123	69.00	70.00	0.1600	0.0700	0.0300
PG03124	70.00	71.00	0.1200	0.0600	0.0100
PG03126	71.00	72.00	0.1300	0.0250	0.0100
PG03127	72.00	72.50	0.1300	0.0250	0.0300
PG03128	72.50	73.50	0.0500	0.0250	0.0100
PG03129	73.50	74.50	0.1400	0.1000	0.0100
PG03130	74.50	75.50	0.1100	0.0250	0.0100
PG03131	75.50	76.50	0.1500	0.0800	0.0200
PG03132	76.50	77.50	0.1300	0.1300	0.0100
PG03133	77.50	78.40	0.2100	0.2200	0.0300
PG03134	78.40	79.60	0.0250	0.2000	0.0100
PG03135	79.60	80.60	0.6600	0.3700	0.0600
PG03136	80.60	81.15	0.0600	0.1900	0.0100
PG03137	81.15	81.60	0.9900	0.1000	0.0800
PG03138	81.60	82.10	0.1500	0.1600	0.0200
PG03139	82.10	83.00	0.0250	0.0700	0.0100
PG03140	83.00	84.10	0.0250	0.0250	0.0100
PG03141	84.10	85.00	0.2700	0.1300	0.0300
PG03142	85.00	85.90	0.1800	0.1300	0.0200
PG03143	85.90	86.40	0.3400	0.1700	0.0400
PG03144	86.40	87.00	0.0250	0.2000	0.0100

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Sample Number	From (m)	To (m)	Ni%	Cu%	Co%
Sample Type	ASSAY				
PG03145	94.00	95.00	0.1700	0.0600	0.0100
PG03146	95.00	96.00	0.1300	0.0250	0.0200
PG03147	96.00	97.00	0.1300	0.0900	0.0100
PG03148	97.00	98.00	0.2100	0.1000	0.0200
PG03149	98.00	99.00	0.2700	0.1400	0.0200
PG03151	99.00	100.20	0.1600	0.0700	0.0100
PG03152	123.90	124.20	0.0800	0.0600	0.0300