# DETAILED LOG

Hole Number: ES2005-32 Units: METRIC

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project Name: | Norway - Espedalen | Primary Coordinates | Grid: UTM84-32N | | Destination Coordinates | Grid: UTM: | Collar Dip: -59.99 |
| Project Number: | 201 | North: 6801178.59 | | | North: 61.34 | | Collar Az: 233.00 |
| Location: | Surface | East: 535453.50 | | | East: 9.66 | | Length: 155.30 (m) |
| | | Elev: 964.79 | | | Elev: 964.79 | | Start Depth: 0.00 (m) |
| Date Started: | Apr 20, 2005 | Collar Survey: Y | | Plugged: N | Contractor: | Arctic Drilling A/S | Final Depth: 155.30 (m) |
| Date Completed: | Apr 22, 2005 | Multishot Survey: Y | | Hole Size: TT46 | Core Storage: | Strand Fjellstue | |
| Logged By: | Lars Weiershaeuser | Pulse EM Survey: Y | | Casing: Left in Hole, capped | | | |

Comments: Purpose: Test 20m up-dip toe on mineralization intersected in hole ES2005-24 (1.19%Ni, 0.42%Cu, 0.05%Co / 8.91m).

Result: Intersected several cm to dm scale remobilized massive sulphide (po-pn-cpy) veinlets within mafic dykes from 121.25-123.49m (2.24m).

Assays: 0.71%Ni, 0.22%Cu, 0.03%Co / 2.24m (121.25-123.49m)

Borehole UTEM: Off-hole reponse (<5m away from hole) @ 122m. Intersected sulphide veinlets from 121.25-123.49m.

## Sample Averages

| Average Type | From (m) | To (m) | Length (m) | Ni% | Cu% | Co% |
|---|---|---|---|---|---|---|
| WEIGHTED | 121.25 | 124.51 | 3.26 | 0.5951 | 0.1867 | 0.0206 |

## Survey Data

| Depth (m) | Azimuth Decimal | Dip Decimal | Test Type | Flag | Comments | Depth (m) | Azimuth Decimal | Dip Decimal | Test Type | Flag | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 233.00 | -59.99 | MShot | OK | | 5.00 | 233.00 | -60.26 | MShot | OK | |
| 10.00 | 233.00 | -60.48 | MShot | OK | | 15.00 | 232.20 | -60.66 | MShot | OK | |
| 20.00 | 231.52 | -60.76 | MShot | OK | | 25.00 | 231.27 | -60.88 | MShot | OK | |
| 30.00 | 231.11 | -61.08 | MShot | OK | | 35.00 | 230.59 | -61.17 | MShot | OK | |
| 40.00 | 230.11 | -61.25 | MShot | OK | | 45.00 | 229.79 | -61.55 | MShot | OK | |
| 50.00 | 229.74 | -61.51 | MShot | OK | | 55.00 | 229.88 | -61.52 | MShot | OK | |
| 60.00 | 229.91 | -61.34 | MShot | OK | | 65.00 | 229.41 | -61.39 | MShot | OK | |
| 70.00 | 229.54 | -61.42 | MShot | OK | | 75.00 | 229.26 | -61.57 | MShot | OK | |
| 80.00 | 228.44 | -61.69 | MShot | OK | | 85.00 | 228.26 | -61.83 | MShot | OK | |
| 90.00 | 227.74 | -61.98 | MShot | OK | | 95.00 | 227.93 | -61.68 | MShot | OK | |
| 100.00 | 227.42 | -61.92 | MShot | OK | | 105.00 | 226.99 | -61.80 | MShot | OK | |
| 110.00 | 227.25 | -61.99 | MShot | OK | | 115.00 | 227.49 | -61.89 | MShot | OK | |
| 120.00 | 227.53 | -61.80 | MShot | OK | | 125.00 | 228.01 | -61.74 | MShot | OK | |
| 130.00 | 228.20 | -61.85 | MShot | OK | | 135.00 | 229.22 | -61.98 | MShot | OK | |
| 140.00 | 229.45 | -61.96 | MShot | OK | | 145.00 | 229.58 | -62.10 | MShot | OK | |
| 150.00 | 229.50 | -62.08 | MShot | OK | | | | | | | |

Hole Number: ES2005-32

Units: METRIC

## Detailed Lithology

| From (m) | To (m) | Lithology |
|---|---|---|
| 0 | 16.30 | C, Casing<br>RQD<br>0.00 - 16.30 : 100.00 % RQD 100.00 % Core<br>CASING |
| 16.30 | 39.23 | MD, Mafic Dike<br>This unit consists of a medium grained, dark gray to greenish-black, non-magnetic, homogeneous, weakly to well-foliated rock. Main minerals are pyroxene/amphibole, chlorite, and other alteration minerals. The contact to the underlying unit is sharp at ~70 degrees tca. Along the footwall contact, intermixed anorthosite ?rafts (18.15 - 18.71m and 25.03 - 25.40m), as well as along the contacts with the minor units, the grain size decreases. The upper ~2m appear mafic and are characterized by 0.5 - 1mm biotite grains. Locally, the contacts with the minor units are intercalated and/or appear recrystallized/digested. The section between 33.14 - 33.3m contains ~50% plagioclase and seems to be a digested xenolith.<br><br>This unit contains trace po.<br>Structure<br>23.57 - 23.58 : S1 First Foliation, 75 Deg to CA<br>35.42 - 35.43 : S1 First Foliation, 70 Deg to CA<br>RQD<br>16.30 - 18.00 : 6.00 % RQD 100.00 % Core<br>18.00 - 21.00 : 19.00 % RQD 100.00 % Core<br>21.00 - 24.00 : 17.00 % RQD 100.00 % Core<br>24.00 - 27.00 : 49.00 % RQD 100.00 % Core<br>27.00 - 30.00 : 42.00 % RQD 100.00 % Core<br>30.00 - 33.00 : 85.00 % RQD 100.00 % Core<br>33.00 - 36.00 : 67.00 % RQD 100.00 % Core<br>36.00 - 39.00 : 74.00 % RQD 100.00 % Core<br>39.00 - 42.00 : 37.00 % RQD 100.00 % Core<br>MINOR INTERVALS:<br>Minor Interval:<br>27.31 - 31.23 4s, Sausseritized/Tectonized Anorthosite<br>Fine to medium grained white to light gray,well foliated, homogeneous, non-magnetic anorthosite. The upper contact is sharp but irregular; the lower contact is sharp at 60 degrees tca.<br><br>This unit is not mineralized.<br>Structure<br>29.20 - 29.21 : S1 First Foliation, 70 Deg to CA |

## Assay Data

| Sample Number | From (m) | To (m) | Length (m) | Ni% | Cu% | Co% |
|---|---|---|---|---|---|---|
| PG03896 | 36.00 | 37.50 | 1.50 | 0.0250 | 0.0250 | 0.0100 |
| PG03897 | 37.50 | 39.00 | 1.50 | 0.0250 | 0.0250 | 0.0100 |

Hole Number: ES2005-32

Units: METRIC

## Detailed Lithology

| From (m) | To (m) | Lithology |
|---|---|---|
| 39.23 | 155.30 | 4s, Sausseritized/Tectonized Anorthosite<br>This unit consists of a fine- to medium-grained, non-magnetic, plagioclase-rich rock. Depending on the alteration minerals present the color is white light gray, green-white, or reddish-white. Where alteration is weak, the rock is well foliated; however, even moderate alteration destroys the foliation. The rock is homogeneous on a meter scale.<br>This unit is cut by sub-meter scale mafic dyklets: 55.81 - 56.08, 56.82 - 56.99m, 57.31 - 57.92, 58.3 - 58.53, 74.93 - 75.26m. The contacts in this section are always sharp and irregular or at various core axis angles.<br><br>Locally, this unit contains sub-mm scale rusted out ?pyrite.<br><br>See minor unit descriptions for detailed information on those units.<br><br>The total thickness of this unit could not be determined as the hole was shut down.<br>Alteration<br>141.00 - 147.60 :HM Hematite, P Pervasive, W Weak<br>141.00 - 147.60 :ALT Alteration, P Pervasive, W Weak fuchsite<br>141.00 - 147.60 :EP Epidote, P Pervasive, W Weak<br>141.00 - 147.60 :Q Quartz, P Pervasive, W Weak<br>116.00 - 119.47 :ALT Alteration, P Pervasive, W Weak fuchsite<br>116.00 - 119.47 :EP Epidote, P Pervasive, W Weak<br>116.00 - 119.47 :Q Quartz, P Pervasive, W Weak locally moderate<br>65.00 - 74.00 :Q Quartz, P Pervasive, M Moderate<br>65.00 - 74.00 :HM Hematite, P Pervasive, M Moderate<br>52.00 - 65.00 :Q Quartz, P Pervasive, M Moderate<br>52.00 - 65.00 :EP Epidote, P Pervasive, M Moderate<br>49.00 - 51.50 :ALT Alteration, P Pervasive, M Moderate fuchsite<br>44.25 - 45.26 :EP Epidote, P Pervasive, M Moderate<br>Structure<br>40.48 - 40.49 : S1 First Foliation, 60 Deg to CA<br>48.18 - 48.19 : S1 First Foliation, 40 Deg to CA<br>57.49 - 57.50 : S1 First Foliation, 70 Deg to CA<br>64.13 - 64.14 : S1 First Foliation, 60 Deg to CA<br>75.30 - 75.31 : S1 First Foliation, 60 Deg to CA<br>93.81 - 93.82 : S1 First Foliation, 85 Deg to CA<br>98.78 - 98.79 : S1 First Foliation, 85 Deg to CA<br>99.92 - 99.93 : S1 First Foliation, 50 Deg to CA<br>103.24 - 103.25 : S1 First Foliation, 80 Deg to CA |

## Assay Data

| Sample Number | From (m) | To (m) | Length (m) | Ni% | Cu% | Co% |
|---|---|---|---|---|---|---|
| PG03898 | 119.47 | 120.50 | 1.03 | 0.0250 | 0.0900 | 0.0100 |
| PG03899 | 120.50 | 121.25 | 0.75 | 0.0250 | 0.0800 | 0.0100 |
| PG03901 | 121.25 | 122.28 | 1.03 | 0.6600 | 0.3400 | 0.0200 |
| PG03902 | 122.28 | 123.49 | 1.21 | 0.7500 | 0.1100 | 0.0300 |
| PG03903 | 123.49 | 123.97 | 0.48 | 0.0600 | 0.0250 | 0.0100 |
| PG03904 | 123.97 | 124.51 | 0.54 | 0.6000 | 0.2100 | 0.0100 |
| PG03905 | 124.51 | 126.00 | 1.49 | 0.0250 | 0.0250 | 0.0100 |

Hole Number: ES2005-32

Units: METRIC

| Detailed Lithology | | | Assay Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| From (m) | To (m) | Lithology | Sample Number | From (m) | To (m) | Length (m) | Ni% | Cu% | Co% |
| | | Structure | | | | | | | |
| | | 107.55 - 107.56 : S1 First Foliation, 80 Deg to CA | | | | | | | |
| | | 114.38 - 114.39 : S1 First Foliation, 65 Deg to CA | | | | | | | |
| | | 126.56 - 126.57 : S1 First Foliation, 90 Deg to CA | | | | | | | |
| | | 134.34 - 134.35 : S1 First Foliation, 80 Deg to CA | | | | | | | |
| | | 139.76 - 139.77 : S1 First Foliation, 70 Deg to CA | | | | | | | |
| | | 147.68 - 147.69 : S1 First Foliation, 60 Deg to CA | | | | | | | |
| | | 154.45 - 154.46 : S1 First Foliation, 80 Deg to CA | | | | | | | |
| | | RQD | | | | | | | |
| | | 42.00 - 45.00 : 67.00 % RQD 100.00 % Core | | | | | | | |
| | | 45.00 - 48.00 : 59.00 % RQD 100.00 % Core | | | | | | | |
| | | 48.00 - 51.00 : 75.00 % RQD 100.00 % Core | | | | | | | |
| | | 51.00 - 54.00 : 75.00 % RQD 100.00 % Core | | | | | | | |
| | | 54.00 - 57.00 : 68.00 % RQD 100.00 % Core | | | | | | | |
| | | 57.00 - 60.00 : 71.00 % RQD 100.00 % Core | | | | | | | |
| | | 60.00 - 63.00 : 87.00 % RQD 100.00 % Core | | | | | | | |
| | | 63.00 - 66.00 : 66.00 % RQD 100.00 % Core | | | | | | | |
| | | 66.00 - 69.00 : 93.00 % RQD 100.00 % Core | | | | | | | |
| | | 69.00 - 72.00 : 86.00 % RQD 100.00 % Core | | | | | | | |
| | | 72.00 - 75.00 : 76.00 % RQD 100.00 % Core | | | | | | | |
| | | 75.00 - 78.00 : 69.00 % RQD 100.00 % Core | | | | | | | |
| | | 78.00 - 81.00 : 75.00 % RQD 100.00 % Core | | | | | | | |
| | | 81.00 - 84.00 : 73.00 % RQD 100.00 % Core | | | | | | | |
| | | 84.00 - 87.00 : 84.00 % RQD 100.00 % Core | | | | | | | |
| | | 87.00 - 90.00 : 68.00 % RQD 100.00 % Core | | | | | | | |
| | | 90.00 - 93.00 : 48.00 % RQD 100.00 % Core | | | | | | | |
| | | 93.00 - 96.00 : 88.00 % RQD 100.00 % Core | | | | | | | |
| | | 96.00 - 99.00 : 86.00 % RQD 100.00 % Core | | | | | | | |
| | | 99.00 - 102.00 : 80.00 % RQD 100.00 % Core | | | | | | | |
| | | 102.00 - 105.00 : 88.00 % RQD 100.00 % Core | | | | | | | |
| | | 105.00 - 108.00 : 74.00 % RQD 100.00 % Core | | | | | | | |
| | | 108.00 - 111.00 : 62.00 % RQD 100.00 % Core | | | | | | | |
| | | 111.00 - 114.00 : 85.00 % RQD 100.00 % Core | | | | | | | |
| | | 114.00 - 117.00 : 87.00 % RQD 100.00 % Core | | | | | | | |
| | | 117.00 - 120.00 : 84.00 % RQD 100.00 % Core | | | | | | | |
| | | 120.00 - 123.00 : 74.00 % RQD 100.00 % Core | | | | | | | |
| | | 123.00 - 126.00 : 64.00 % RQD 100.00 % Core | | | | | | | |
| | | 126.00 - 129.00 : 97.00 % RQD 100.00 % Core | | | | | | | |
| | | 129.00 - 132.00 : 96.00 % RQD 100.00 % Core | | | | | | | |

Hole Number: ES2005-32 Units: METRIC

| Detailed Lithology | | | Assay Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| From (m) | To (m) | Lithology | Sample Number | From (m) | To (m) | Length (m) | Ni% | Cu% | Co% |
| | | RQD<br>132.00 - 135.00 : 76.00 % RQD 100.00 % Core<br>135.00 - 138.00 : 73.00 % RQD 100.00 % Core<br>138.00 - 141.00 : 82.00 % RQD 100.00 % Core<br>141.00 - 144.00 : 63.00 % RQD 100.00 % Core<br>144.00 - 147.00 : 43.00 % RQD 100.00 % Core<br>147.00 - 150.00 : 94.00 % RQD 100.00 % Core<br>150.00 - 153.00 : 86.00 % RQD 100.00 % Core<br>153.00 - 155.30 : 100.00 % RQD 100.00 % Core<br>MINOR INTERVALS:<br>Minor Interval:<br>80.5 - 91.5 4s, Sausseritized/Tectonized Anorthosite<br>Anorthositic section that is characterized my numerous cm- to dm-scale more mafic (?noritic) intercalations, which contain abundant sub-mm biotite.<br>Structure<br>81.12 - 81.13 : S1 First Foliation, 75 Deg to CA<br>86.68 - 86.69 : S1 First Foliation, 65 Deg to CA<br>Minor Interval:<br>96.18 - 98.58 MD, Mafic Dike<br>Homogeneous medium gray, non-magnetic, fine-grained mafic subunit. The rock is finer grained within ~10cm of the upper contact. The upper contact is sharp at ~90 degrees tca; the lower contact is sharp but irregular.<br><br>This unit is not mineralized.<br>Minor Interval:<br>119.47 - 120.5 MD, Mafic Dike<br>Homogeneous medium gray, non-magnetic, fine-grained, well-foliated mafic subunit. The rock is finer grained within ~5cm of the lower contact. The upper and lower contacts are sharp at ~20 (!) and ~70 degrees tca, respectively. The upper contact coincides with an about 5mm thick quartz vein.<br><br>Recrystallized plagioclase ?fragments are contained within this unit.<br><br>This unit is not mineralized. | | | | | | | | |

Hole Number: ES2005-32

Units: METRIC

| Detailed Lithology | | | Assay Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| From (m) | To (m) | Lithology | Sample Number | From (m) | To (m) | Length (m) | Ni% | Cu% | Co% |
| | | MINOR INTERVALS:<br>Minor Interval:<br>121.25 - 123.49 MD, Mafic Dike<br>Homogeneous medium gray, non-magnetic, fine-grained mafic subunit. The unit is characterized by remobilized mm - cm-scale sulfide veinlets (po, cpy, pn). "Massive" mineralization is located at: 121.93 - 121.95m, 122.93 - 122.97m, and 123.46 - 123.49m. The latter section coincides with the lower contact of this subunit. The upper contact is sharp at ~90 degrees tca; the lower contact is sharp but irregular.<br>Mineralization<br>121.25 - 123.49 : Cpy Chalcopyrite, VN Veins, 1%<br>mm - cm remob. veinlets, massive at 121.93 - 121.95, 122.93 - 122.97, 123.46 - 123.49m<br>121.25 - 123.49 : Pn Pentlandite, VN Veins, 1%<br>mm - cm remob. veinlets, massive at 121.93 - 121.95, 122.93 - 122.97, 123.46 - 123.49m<br>121.25 - 123.49 : Po Pyrrhotite, VN Veins, 3%<br>mm - cm remob. veinlets, massive at 121.93 - 121.95, 122.93 - 122.97, 123.46 - 123.49m<br>Minor Interval:<br>123.97 - 124.51 4s, Sausseritized/Tectonized Anorthosite<br>Dark gray, well-foliated, non -magnetic, chlorite?-altered anorthosite. The alteration is restricted to a mineralized interval where mm-scale remobilized sulfide veinlets (po, pn, cpy) are abundant. The upper and lower contact of this subunit are gradational over ~5cm.<br>Mineralization<br>124.30 - 124.51 : Cpy Chalcopyrite, VN Veins, 1%<br>mm-scale remobilized veinlets<br>124.30 - 124.51 : Pn Pentlandite, VN Veins, 1%<br>fine-grained in remobilized veinlets<br>124.30 - 124.51 : Po Pyrrhotite, VN Veins, 3%<br>mm-scale remobilized veinlets<br>Minor Interval:<br>143.5 - 145 4s, Sausseritized/Tectonized Anorthosite<br>Locally strongly broken up to completely ground-up core; likely fault zone.<br>Minor Interval:<br>150.93 - 153.58 MD, Mafic Dike<br>Homogeneous medium gray, non-magnetic, fine-grained, well-foliated mafic subunit. The rock is finer grained within ~5cm of the upper and lower contacts. The upper contact is characterized by digested anorthosite wall rock. The lower contact is sharp at ~70 degrees tca.<br><br>This unit is not mineralized. | | | | | | | | |

Hole Number: ES2005-32 Units: METRIC

| Detailed Lithology | | | Assay Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| From (m) | To (m) | Lithology | Sample Number | From (m) | To (m) | Length (m) | Ni% | Cu% | Co% |
| | | MINOR INTERVALS:<br>Minor Interval:<br>154.93 - 155.3 MD, Mafic Dike<br>Homogeneous medium gray, non-magnetic, fine-grained, well-foliated mafic subunit. The rock is finer grained within ~5cm of the upper contact. The upper contact is sharp at ~90 degrees tca; the lower contact is unknown as the hole was shutdown.<br><br>This unit is not mineralized. | | | | | | | |

## Samples

| Sample Number | From (m) | To (m) | Ni% | Cu% | Co% |
|---|---|---|---|---|---|
| Sample Type ASSAY | | | | | |
| PG03896 | 36.00 | 37.50 | 0.0250 | 0.0250 | 0.0100 |
| PG03897 | 37.50 | 39.00 | 0.0250 | 0.0250 | 0.0100 |
| PG03898 | 119.47 | 120.50 | 0.0250 | 0.0900 | 0.0100 |
| PG03899 | 120.50 | 121.25 | 0.0250 | 0.0800 | 0.0100 |
| PG03901 | 121.25 | 122.28 | 0.6600 | 0.3400 | 0.0200 |
| PG03902 | 122.28 | 123.49 | 0.7500 | 0.1100 | 0.0300 |
| PG03903 | 123.49 | 123.97 | 0.0600 | 0.0250 | 0.0100 |
| PG03904 | 123.97 | 124.51 | 0.6000 | 0.2100 | 0.0100 |
| PG03905 | 124.51 | 126.00 | 0.0250 | 0.0250 | 0.0100 |