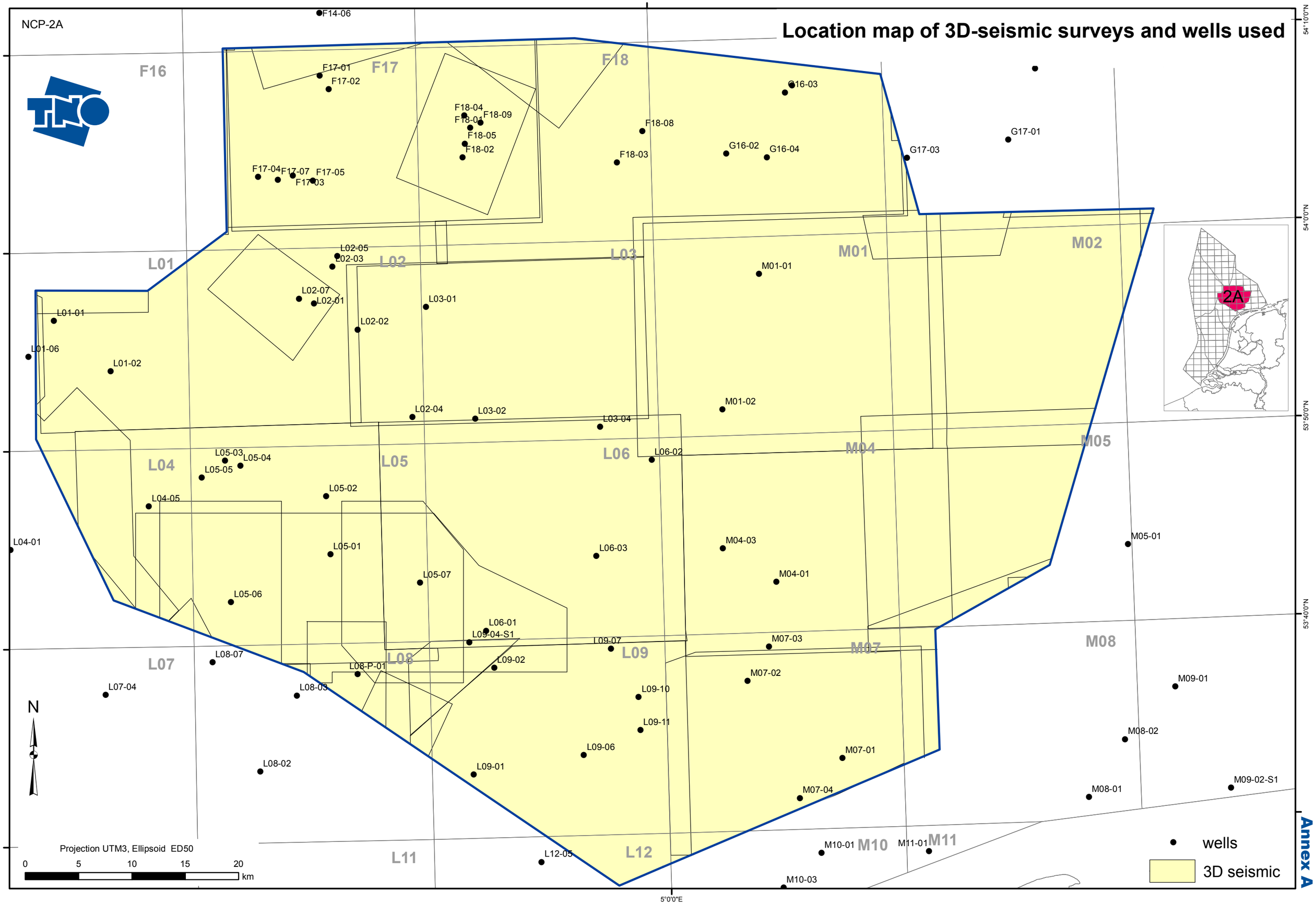
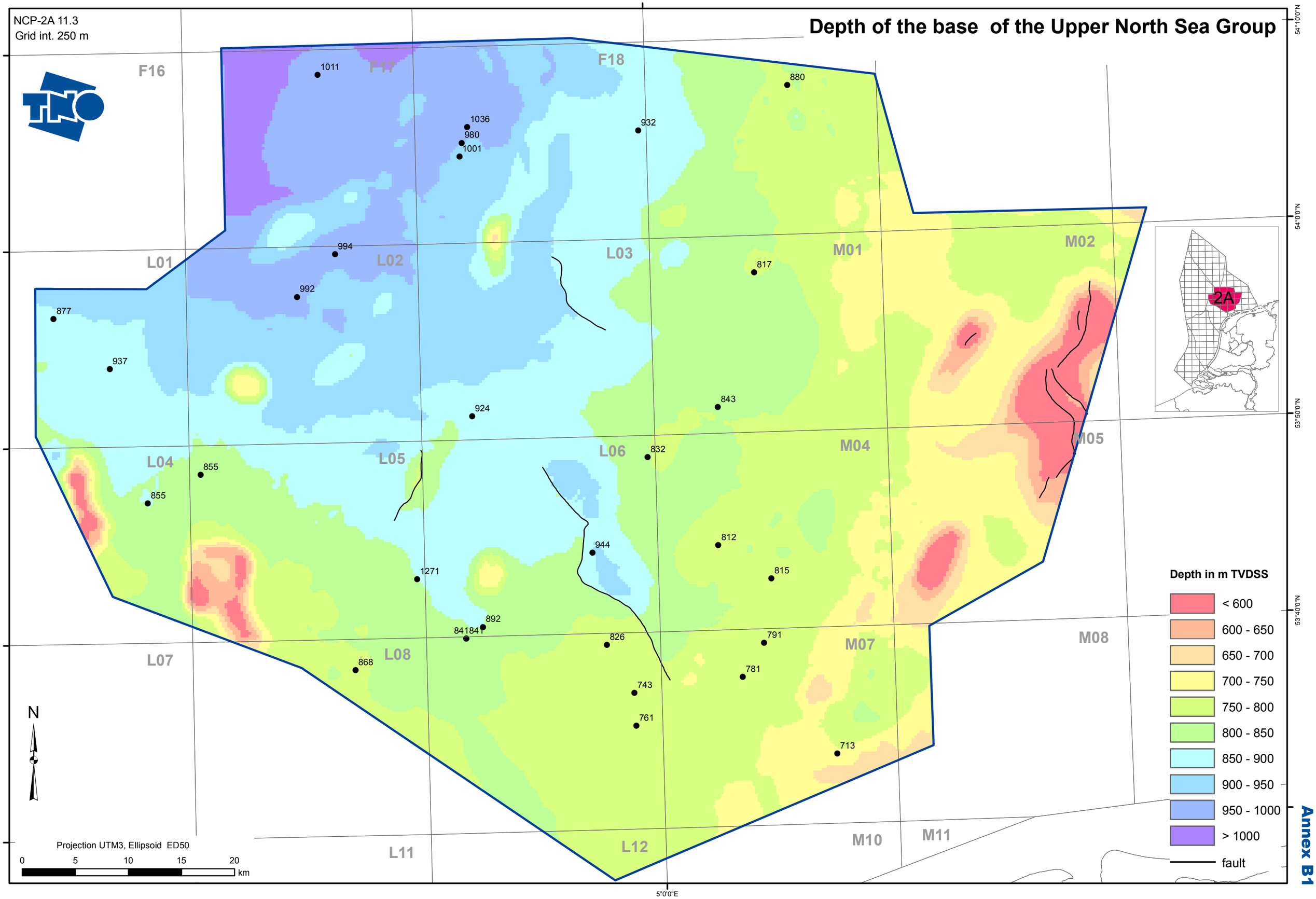

NCP-2A
Location map of 3D-seismic surveys and wells used
F16
F17
F18
L01
L02
L03
L04
L05
L06
L07
L08
L09
L11
L12
M01
M02
M04
M05
M07
M08
M10
M11
F14-06
F17-01
F17-02
F17-04
F17-07
F17-05
F17-03
F18-04
F18-01
F18-09
F18-05
F18-02
F18-08
F18-03
G16-03
G16-02
G16-04
G17-03
G17-01
L02-05
L02-03
L02-07
L02-01
L02-02
L03-01
L01-01
L01-06
L01-02
L02-04
L03-02
L03-04
L05-03
L05-04
L05-05
L05-02
L04-05
L04-01
L05-01
L05-07
L05-06
L06-01
L09-04-S1
L09-07
L09-02
L08-P-01
L08-07
L08-03
L07-04
L08-02
L09-10
L09-11
L09-06
L09-01
L06-02
L06-03
M01-01
M01-02
M04-03
M04-01
M07-03
M07-02
M07-01
M07-04
M05-01
M09-01
M08-02
M08-01
M09-02-S1
M10-01
M11-01
M10-03
L12-05
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
wells
3D seismic
2A
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

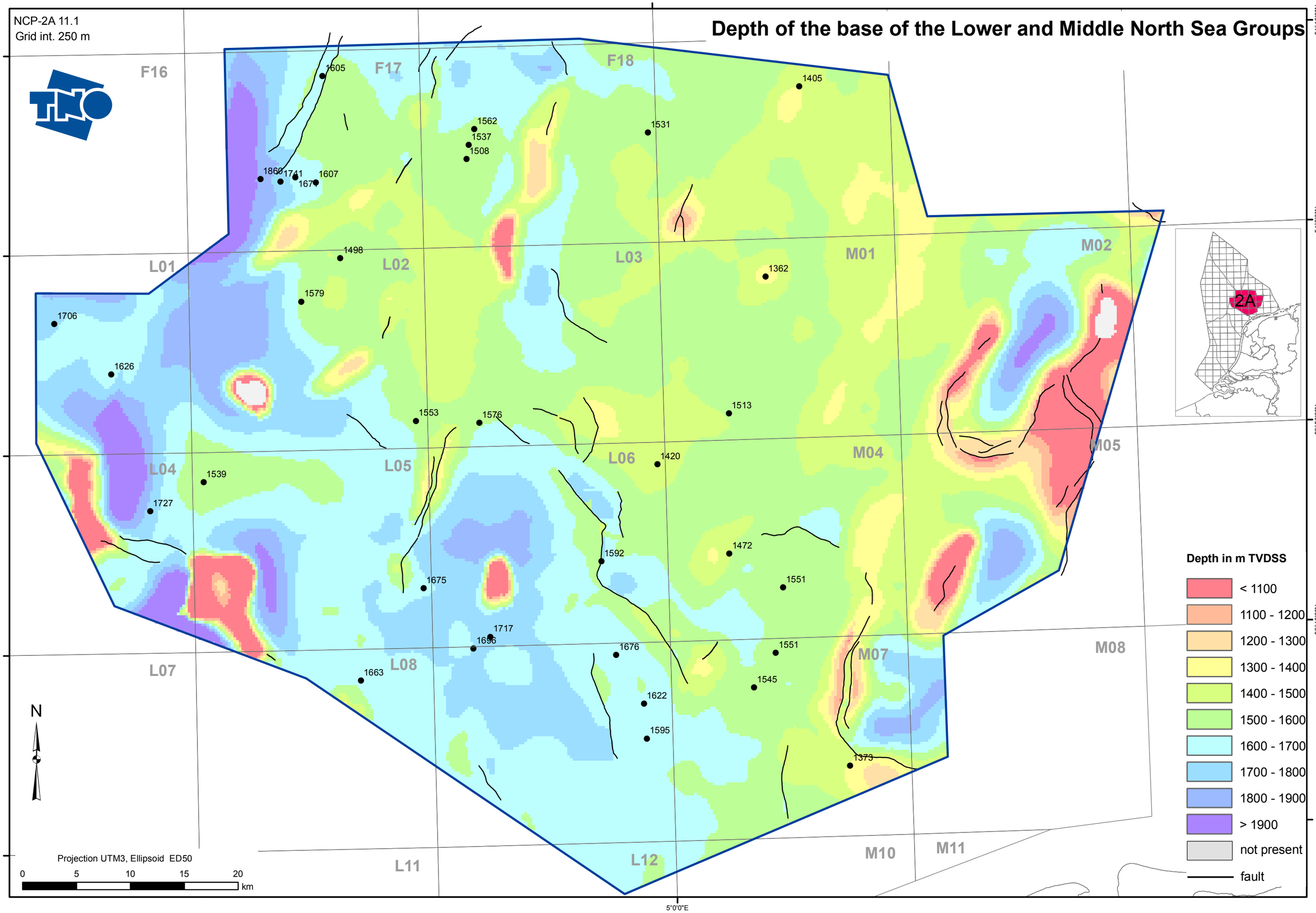
Annex A


NCP-2A 11.3
Grid int. 250 m
Depth of the base of the Upper North Sea Group
F16
F17
F18
L01
L02
L03
L04
L05
L06
L07
L08
L11
L12
M01
M02
M04
M05
M07
M08
M10
M11
1011
1036
980
1001
932
880
994
992
817
877
937
924
843
855
855
832
944
812
815
1271
892
841841
826
791
868
781
743
761
713
2A
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E
Depth in m TVDSS
< 600
600 - 650
650 - 700
700 - 750
750 - 800
800 - 850
850 - 900
900 - 950
950 - 1000
> 1000
fault

Annex B1

NCP-2A 11.1
Grid int. 250 m

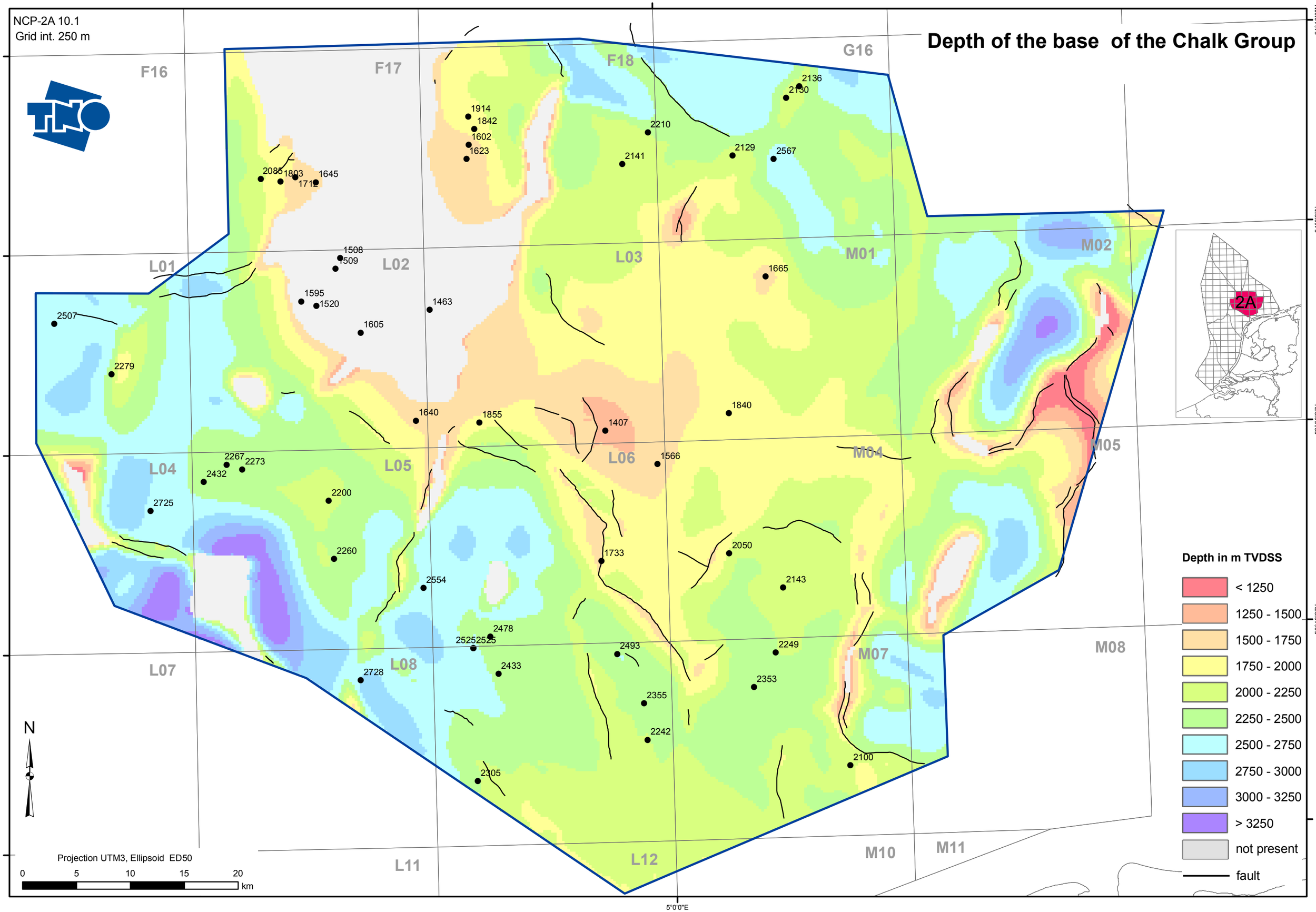
Depth of the base of the Lower and Middle North Sea Groups



Annex B2

NCP-2A 10.1
Grid int. 250 m

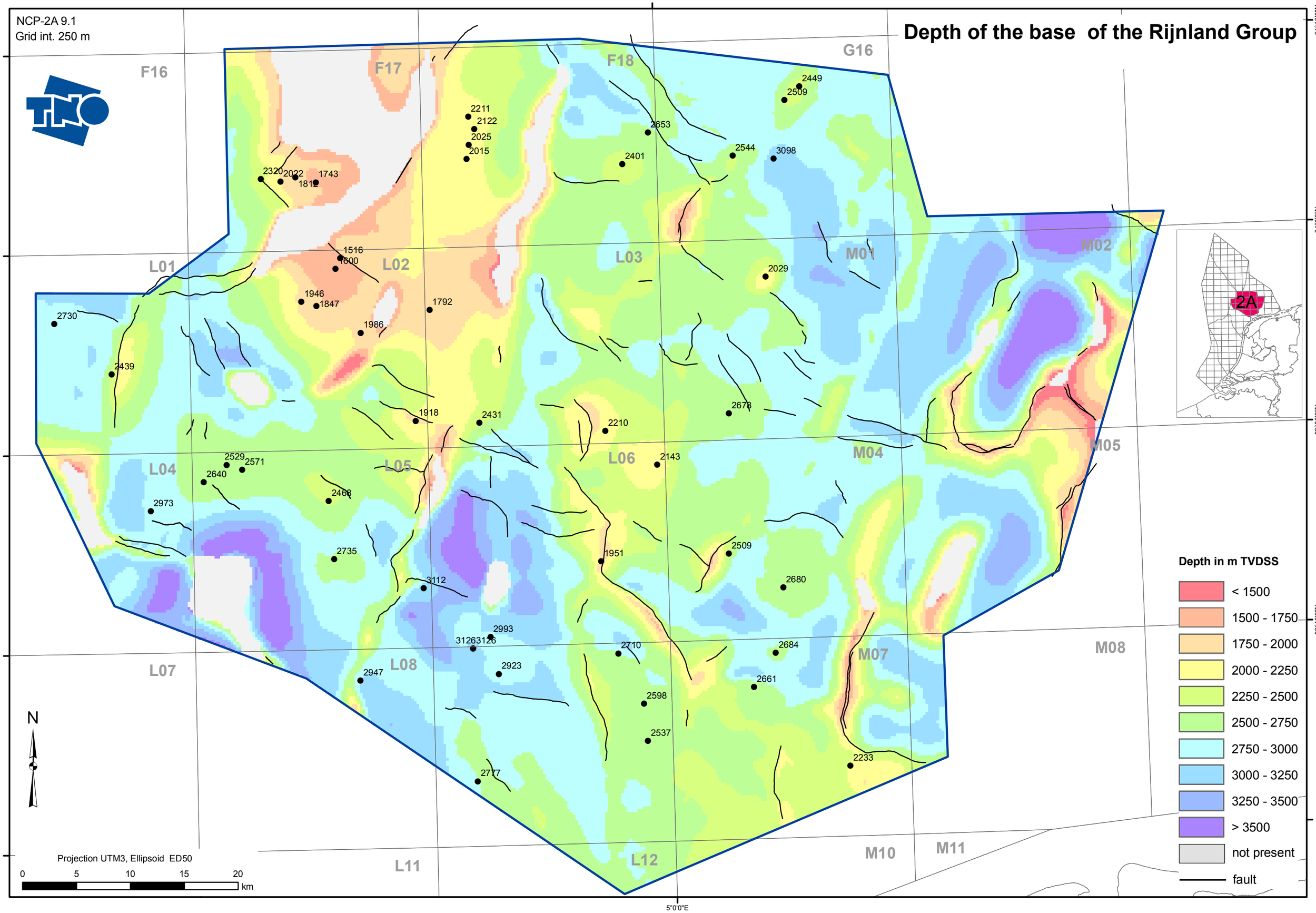
Depth of the base of the Chalk Group



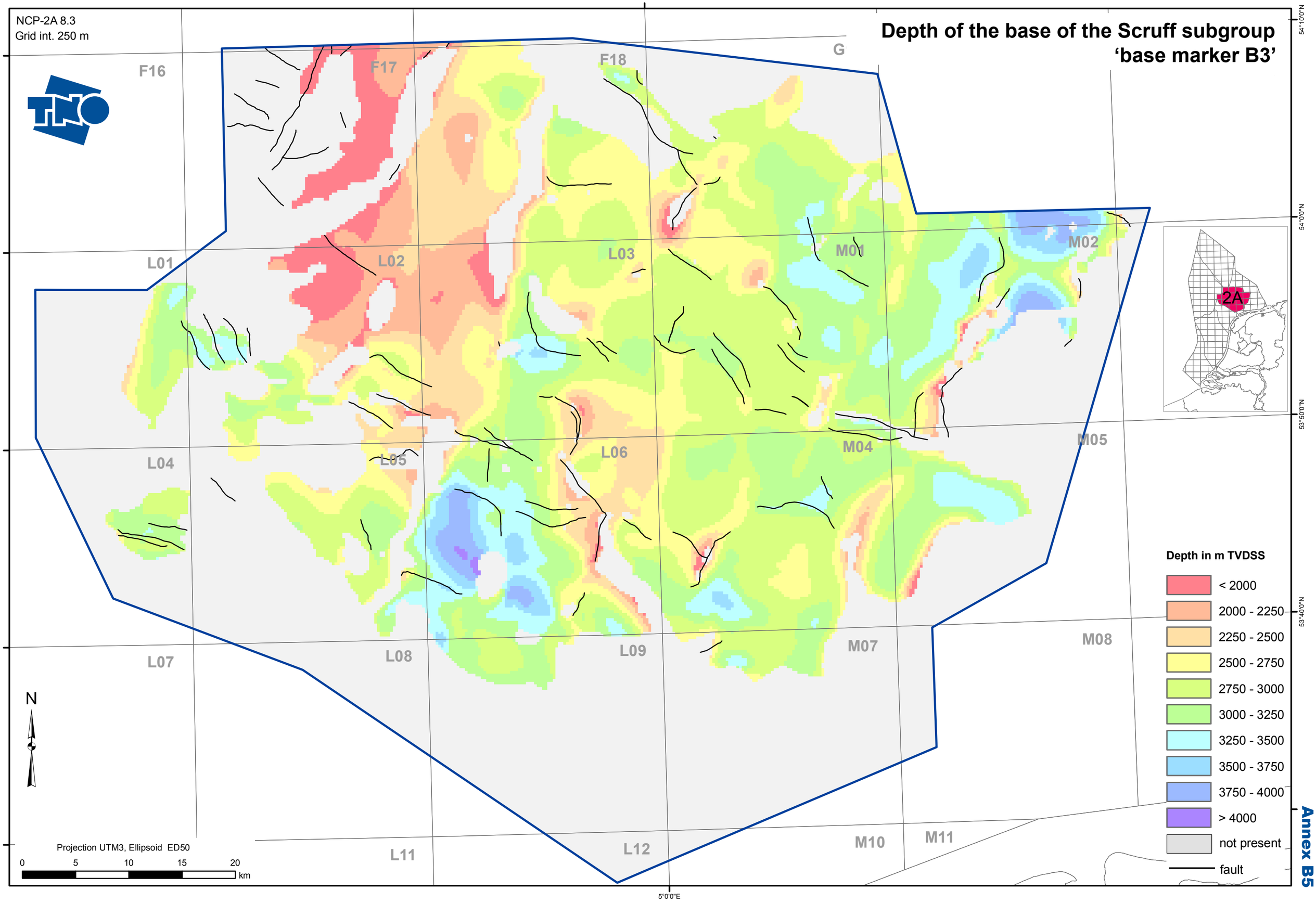
Annex B3

NCP-2A 9.1
Grid int. 250 m

Depth of the base of the Rijnland Group



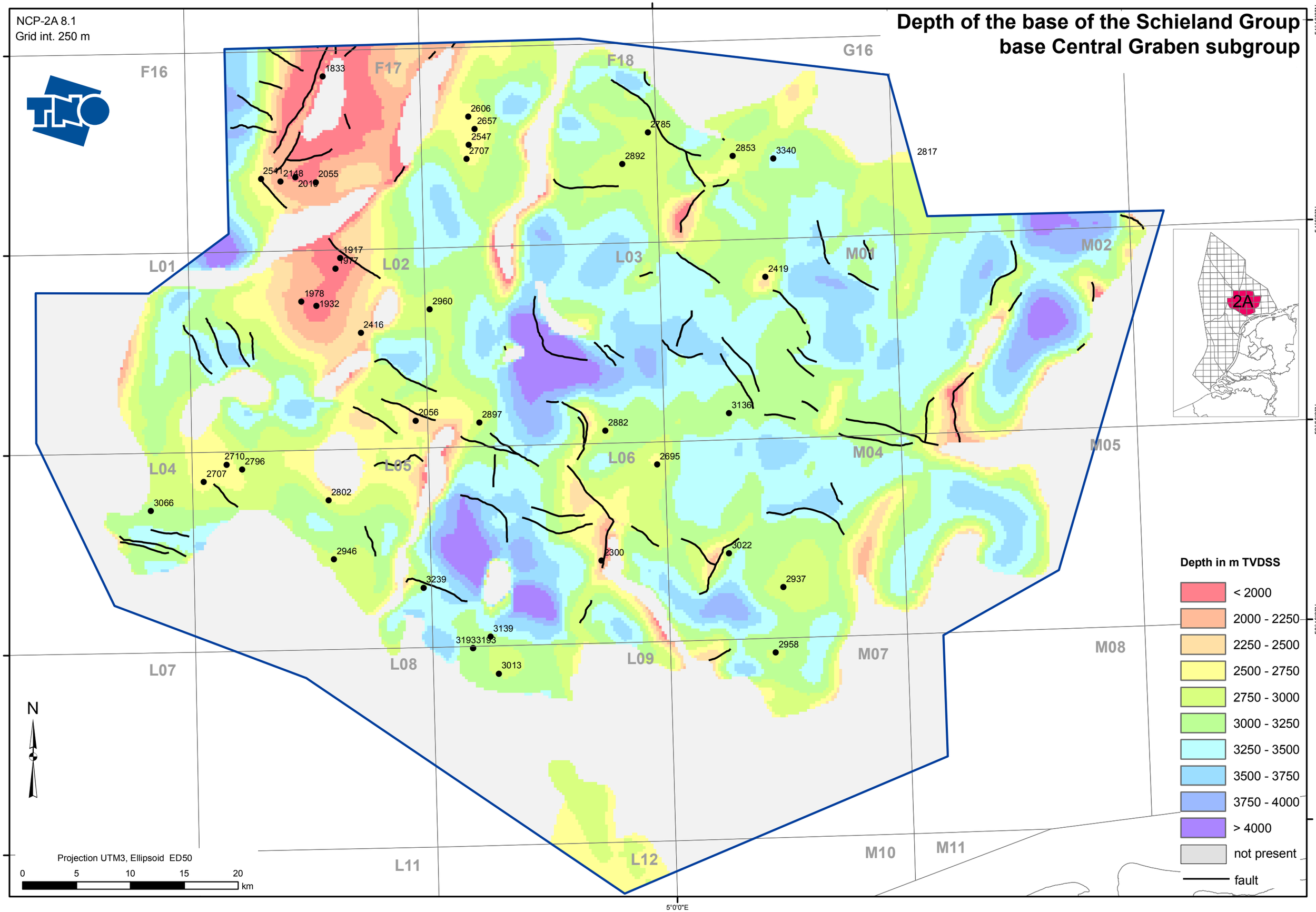
Annex B4


NCP-2A 8.3
Grid int. 250 m
Depth of the base of the Scruff subgroup
'base marker B3'
F16
F17
F18
G
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
2A
N
Projection UTM3, Ellipsoid ED50
0
5
10
15
20
km
Depth in m TVDSS
< 2000
2000 - 2250
2250 - 2500
2500 - 2750
2750 - 3000
3000 - 3250
3250 - 3500
3500 - 3750
3750 - 4000
> 4000
not present
fault
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

Annex B5

NCP-2A 8.1
Grid int. 250 m

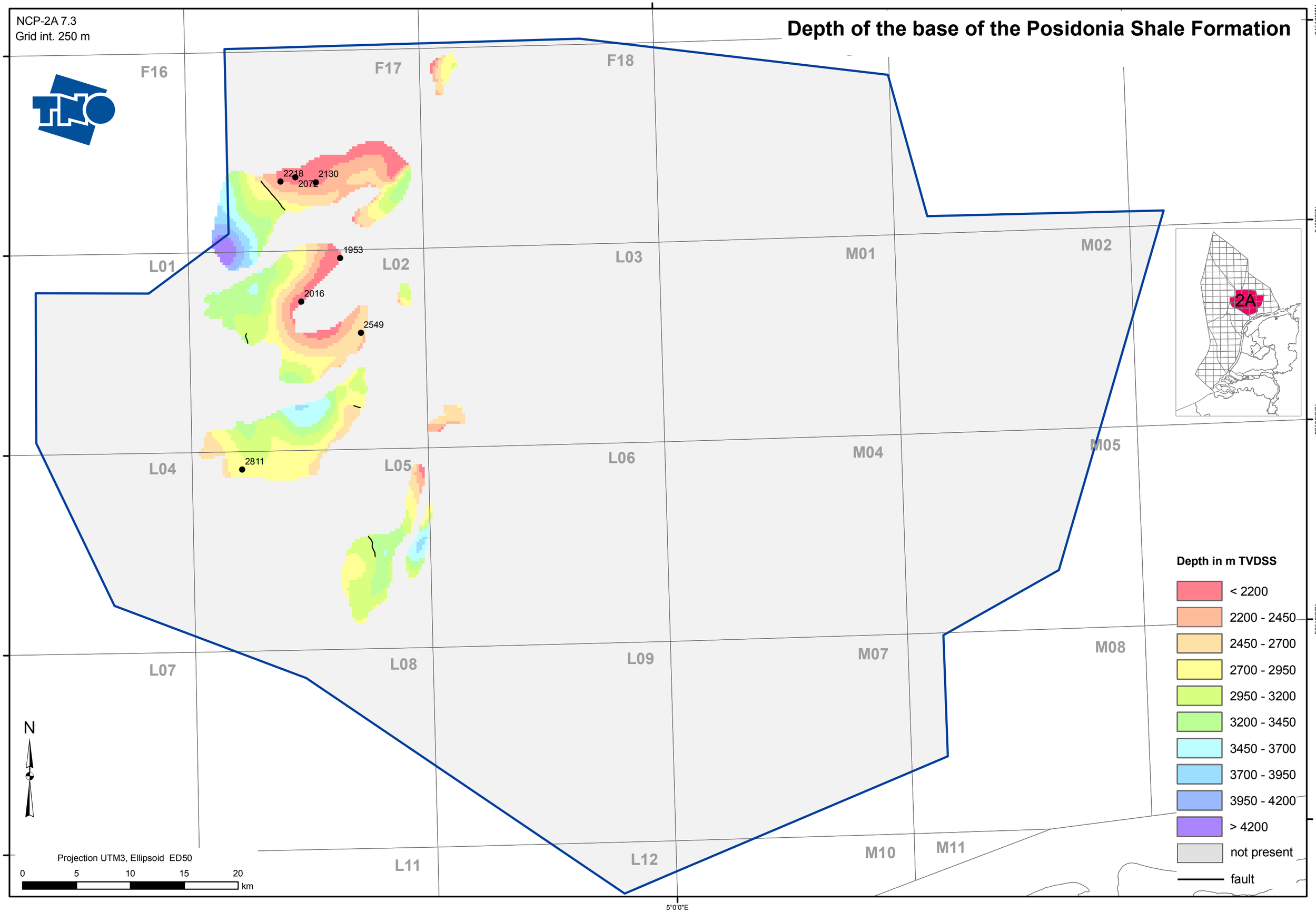
Depth of the base of the Schieland Group
base Central Graben subgroup



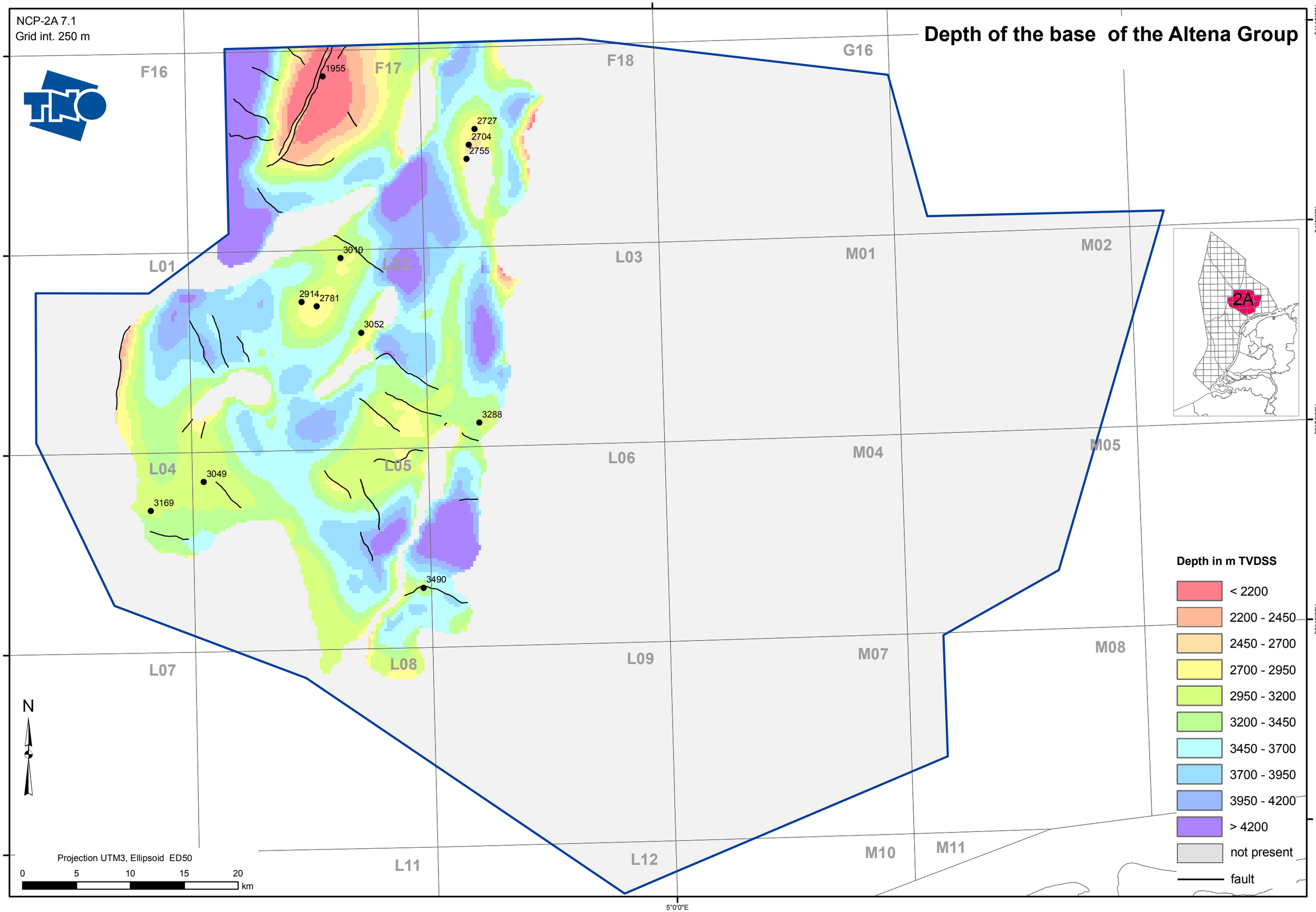
Annex B6

NCP-2A 7.3
Grid int. 250 m

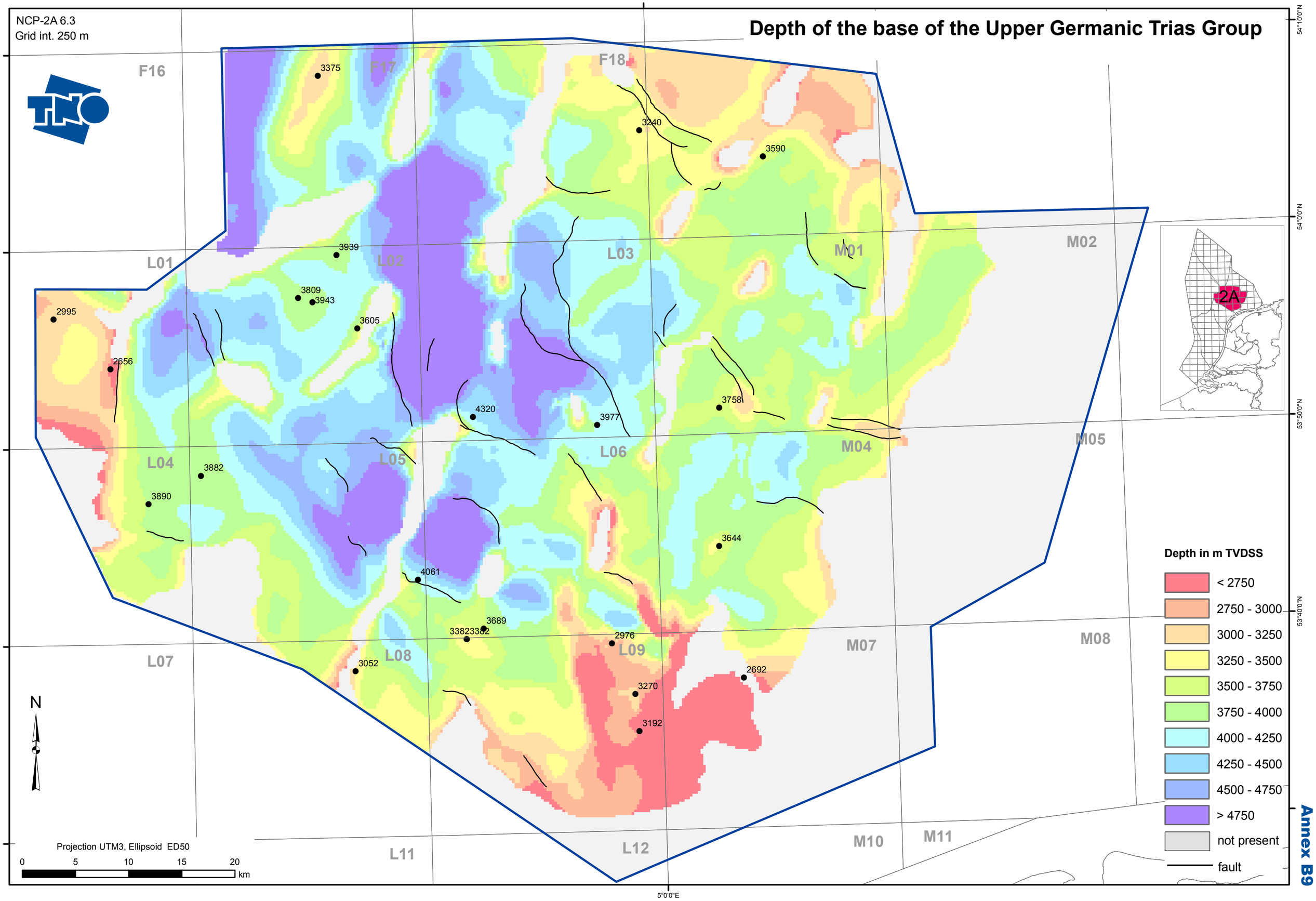
Depth of the base of the Posidonia Shale Formation



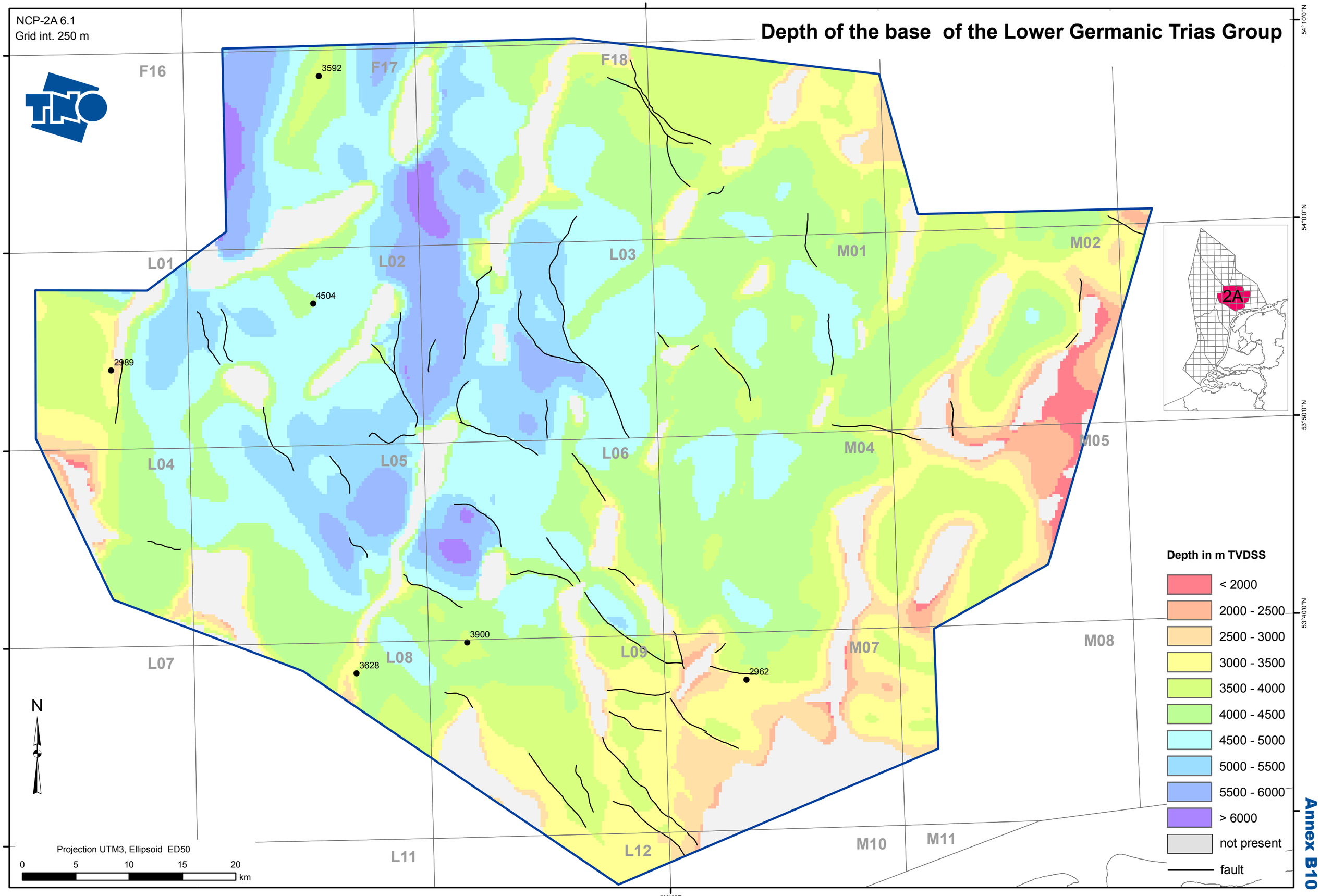
Annex B7


NCP-2A 7.1
Grid int. 250 m
Depth of the base of the Altena Group
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
1955
2727
2704
2755
3010
2914
2781
3052
3288
3049
3169
3490
2A
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
Depth in m TVDSS
< 2200
2200 - 2450
2450 - 2700
2700 - 2950
2950 - 3200
3200 - 3450
3450 - 3700
3700 - 3950
3950 - 4200
> 4200
not present
fault
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

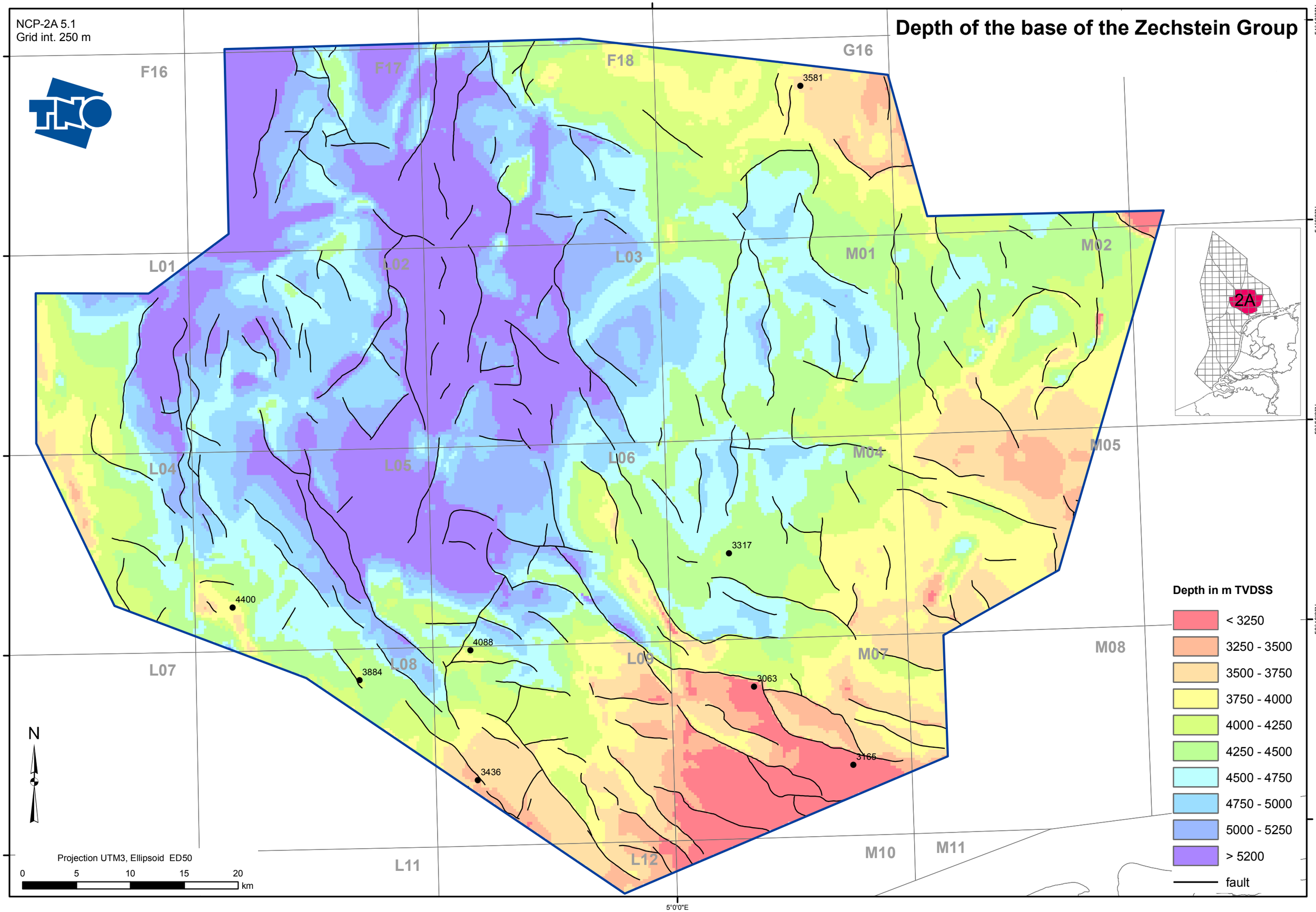
Annex B8


NCP-2A 6.3
Grid int. 250 m
Depth of the base of the Upper Germanic Trias Group
F16
F17
F18
L01
L02
L03
L04
L05
L06
L07
L08
L09
L11
L12
M01
M02
M04
M05
M07
M08
M10
M11
3375
3240
3590
3939
3809
3943
3605
2995
2656
4320
3977
3758
3882
3890
3644
4061
3689
3382
3382
2976
3052
2692
3270
3192
2A
Depth in m TVDSS
< 2750
2750 - 3000
3000 - 3250
3250 - 3500
3500 - 3750
3750 - 4000
4000 - 4250
4250 - 4500
4500 - 4750
> 4750
not present
fault
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

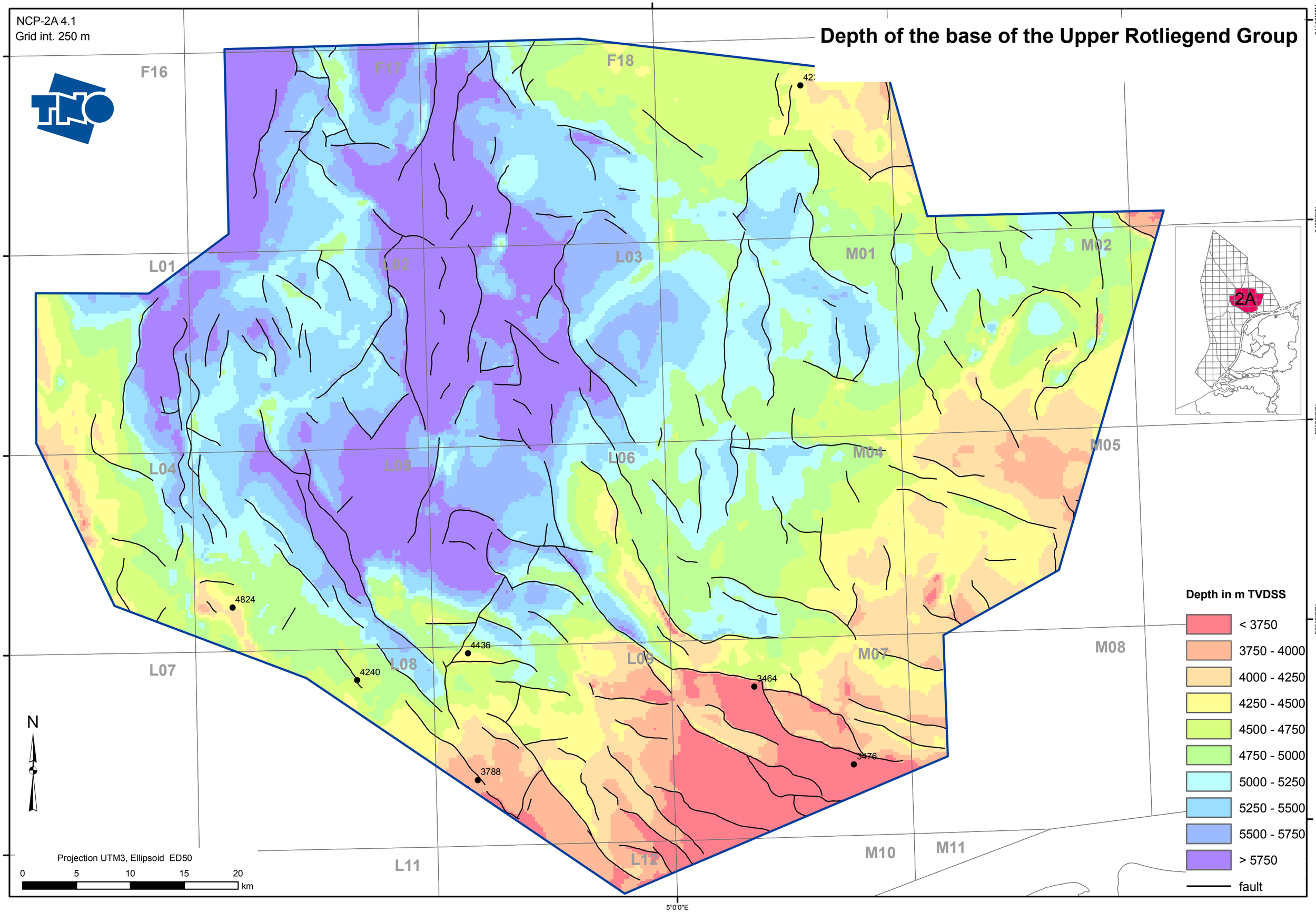
Annex B9


NCP-2A 6.1
Grid int. 250 m
Depth of the base of the Lower Germanic Trias Group
F16
F17
F18
L01
L02
L03
L04
L05
L06
L07
L08
L09
L11
L12
M01
M02
M04
M05
M07
M08
M10
M11
3592
4504
2989
3900
3628
2962
2A
Depth in m TVDSS
< 2000
2000 - 2500
2500 - 3000
3000 - 3500
3500 - 4000
4000 - 4500
4500 - 5000
5000 - 5500
5500 - 6000
> 6000
not present
fault
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

Annex B10

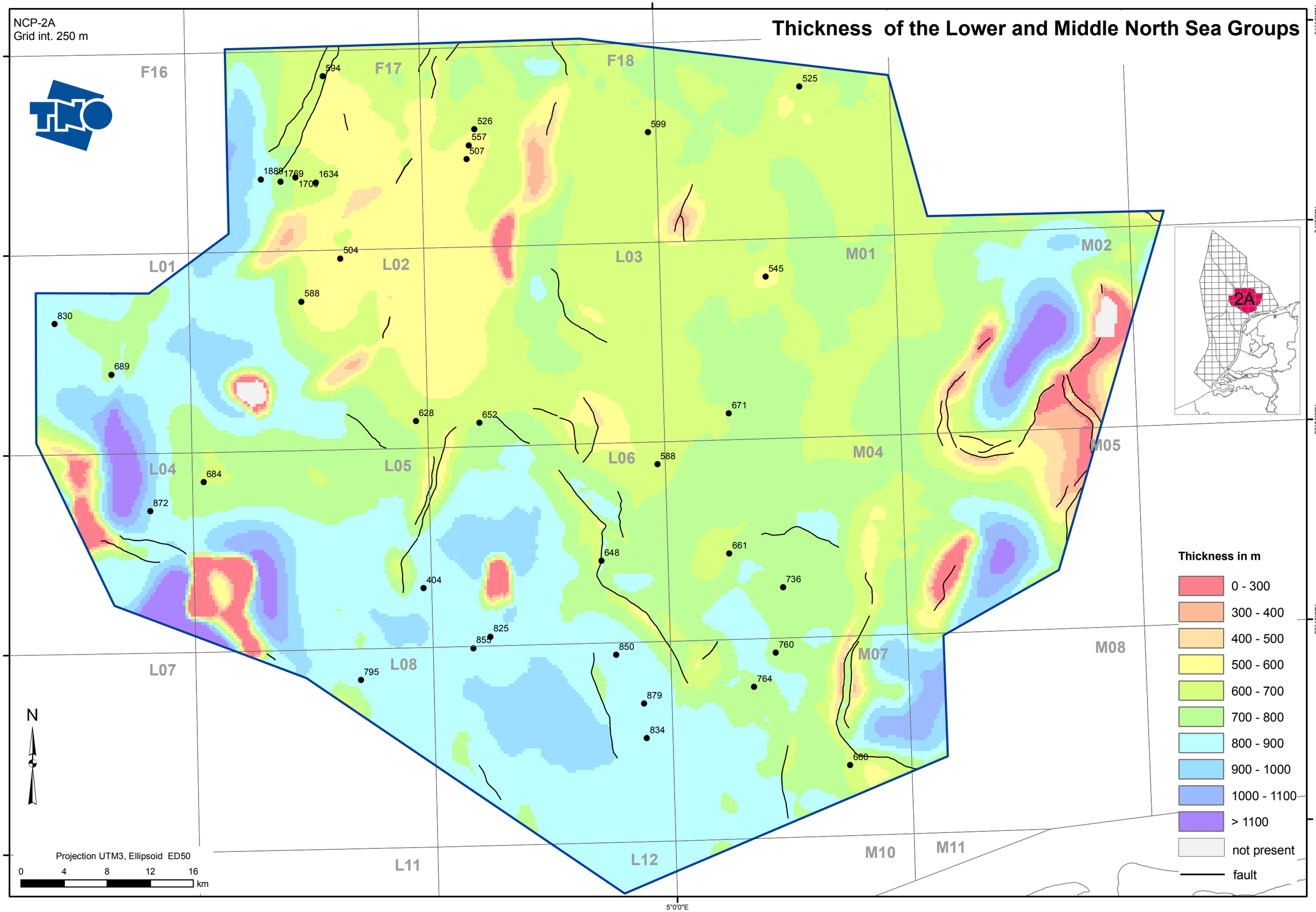

NCP-2A 5.1
Grid int. 250 m
Depth of the base of the Zechstein Group
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
3581
3317
4400
4088
3884
3063
3165
3436
2A
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
Depth in m TVDSS
< 3250
3250 - 3500
3500 - 3750
3750 - 4000
4000 - 4250
4250 - 4500
4500 - 4750
4750 - 5000
5000 - 5250
> 5200
fault
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

Annex B11

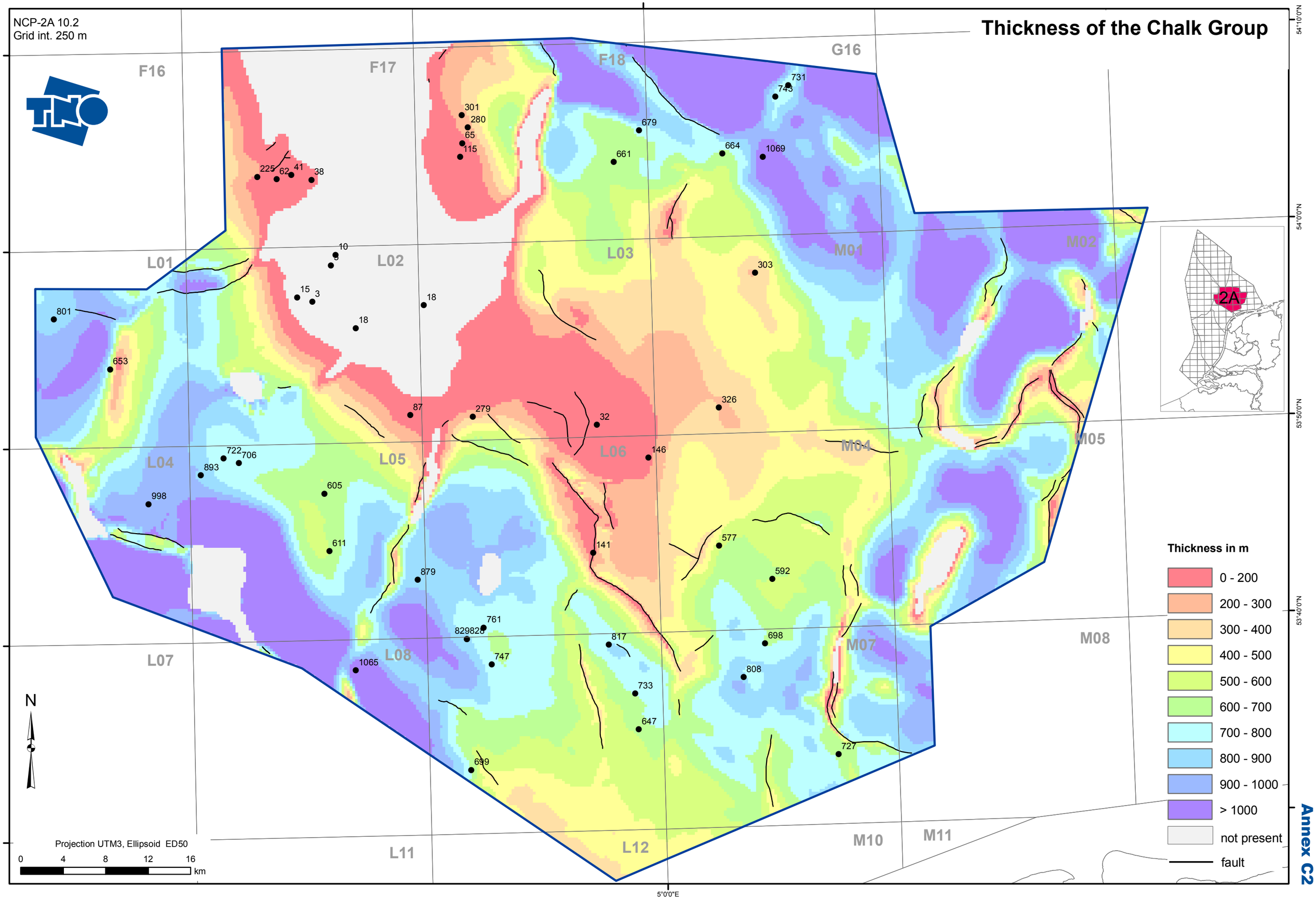

NCP-2A 4.1
Grid int. 250 m
Depth of the base of the Upper Rotliegend Group
F16
F17
F18
L01
L02
L03
L04
L05
L06
L07
L08
L09
L11
L12
M01
M02
M04
M05
M07
M08
M10
M11
4824
4240
4436
3788
3464
3476
2A
Depth in m TVDSS
< 3750
3750 - 4000
4000 - 4250
4250 - 4500
4500 - 4750
4750 - 5000
5000 - 5250
5250 - 5500
5500 - 5750
> 5750
fault
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

Annex B12

Thickness of the Lower and Middle North Sea Groups



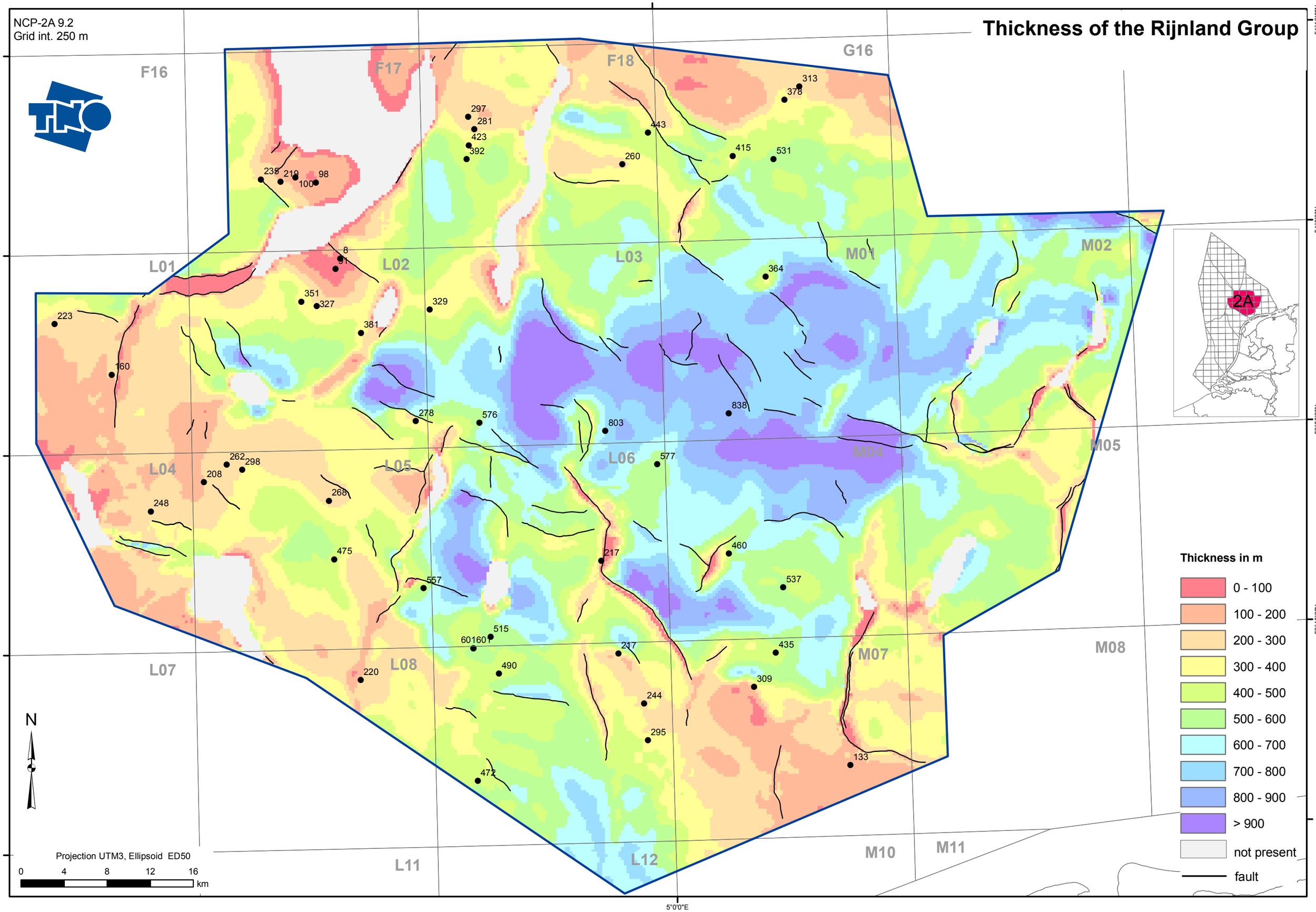
Annex C1


NCP-2A 10.2
Grid int. 250 m
Thickness of the Chalk Group
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
M07
M08
L11
L12
M10
M11
2A
Thickness in m
0 - 200
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
900 - 1000
> 1000
not present
fault
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

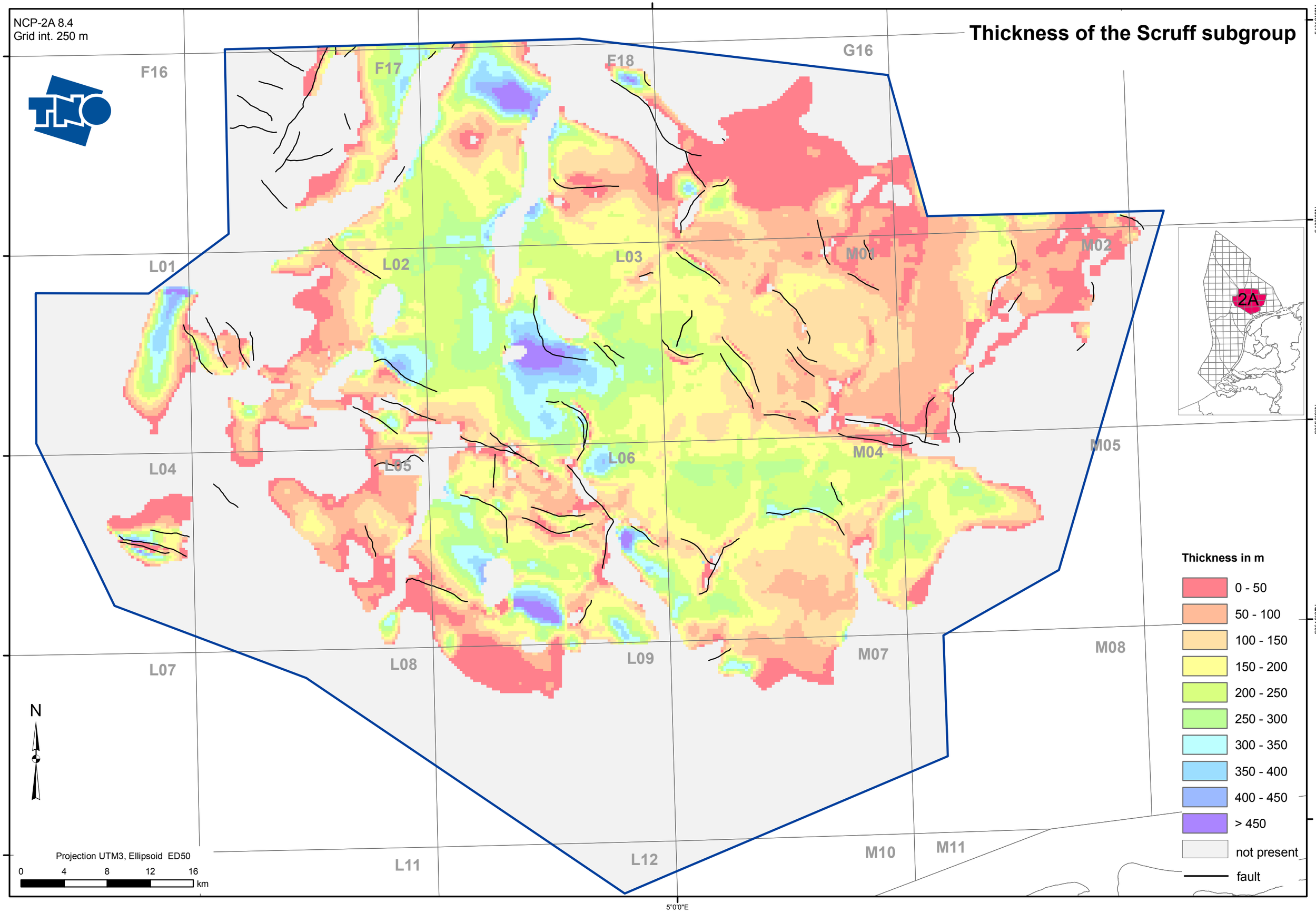
Annex C2

NCP-2A 9.2
Grid int. 250 m

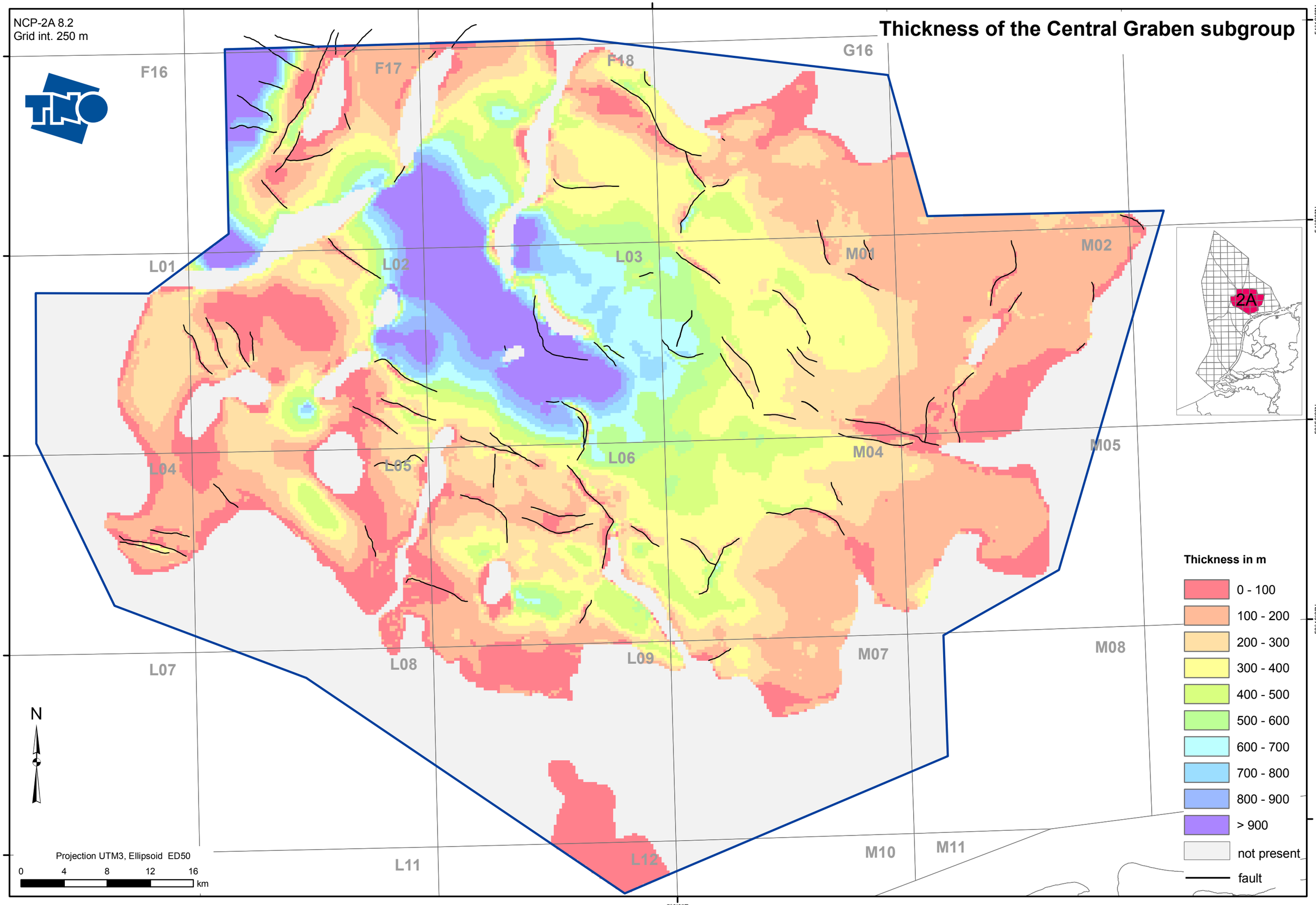
Thickness of the Rijnland Group



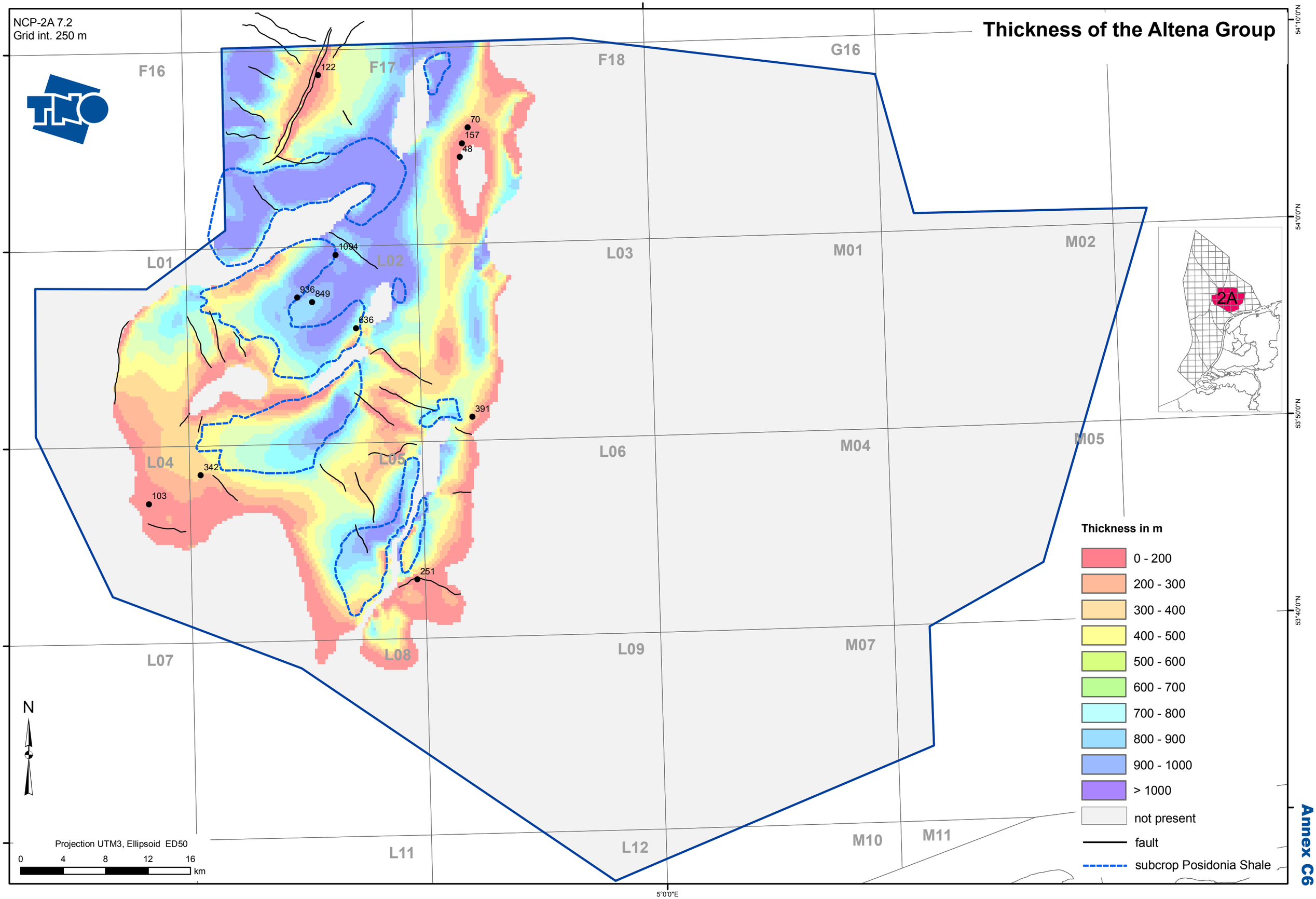
Annex C3


NCP-2A 8.4
Grid int. 250 m
Thickness of the Scruff subgroup
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
2A
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16 km
Thickness in m
0 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350
350 - 400
400 - 450
> 450
not present
fault
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

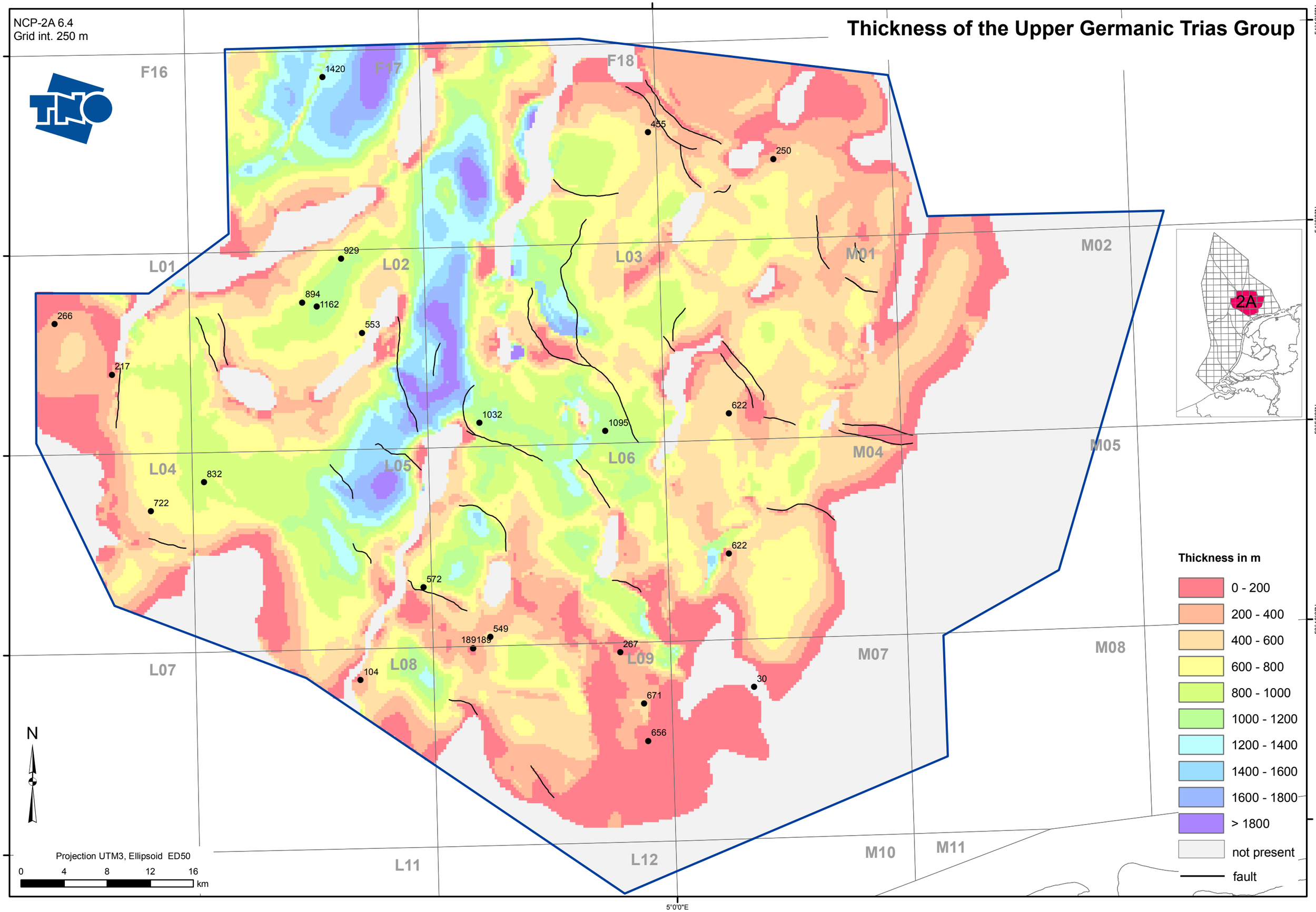
Annex C4


NCP-2A 8.2
Grid int. 250 m
Thickness of the Central Graben subgroup
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
2A
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16
km
Thickness in m
0 - 100
100 - 200
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
> 900
not present
fault
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

Annex C5


NCP-2A 7.2
Grid int. 250 m
Thickness of the Altena Group
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
L11
L12
M10
M11
122
70
157
48
1094
936
849
636
391
342
103
251
2A
Thickness in m
0 - 200
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
900 - 1000
> 1000
not present
fault
subcrop Posidonia Shale
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16
km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

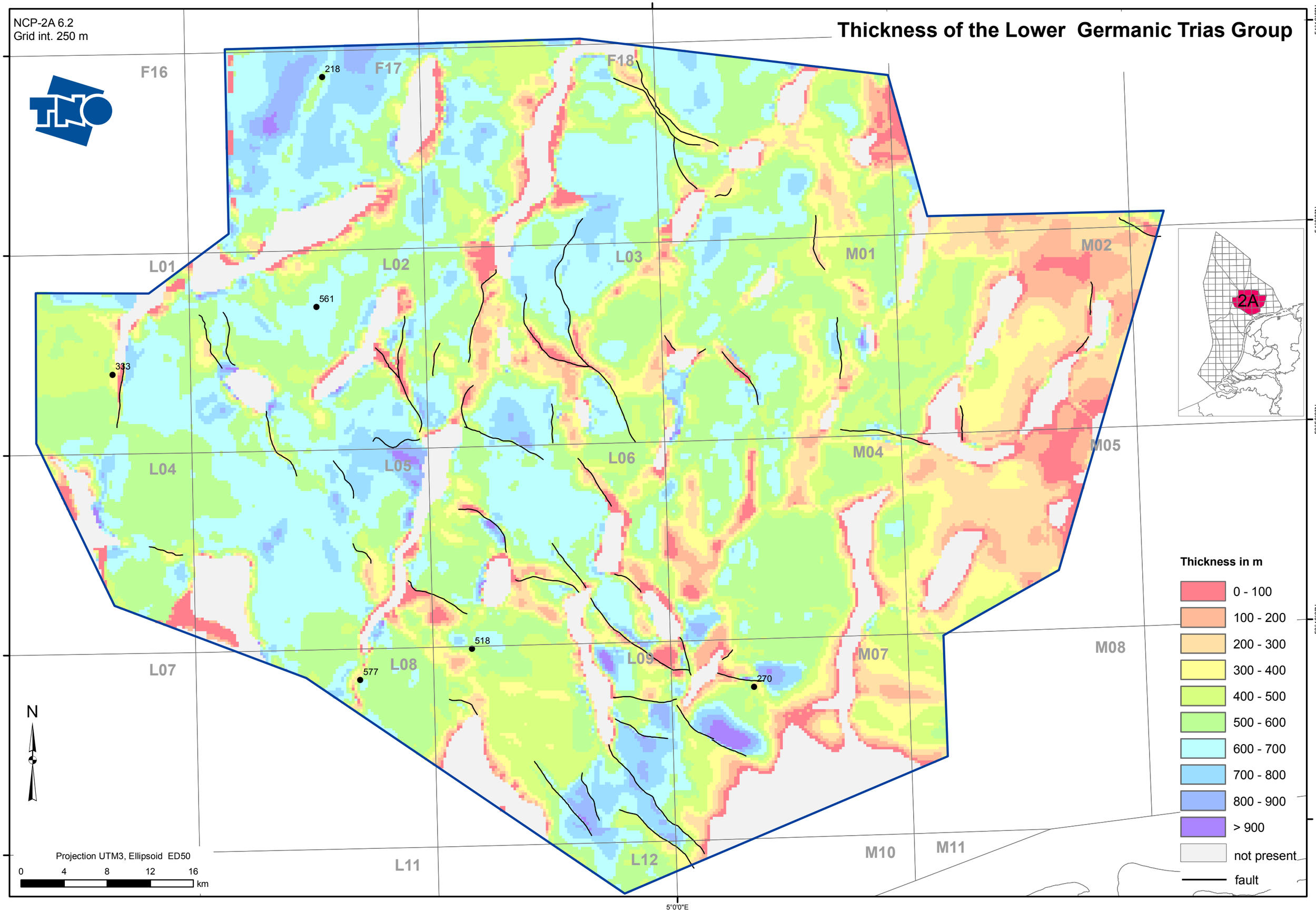
Annex C6


NCP-2A 6.4
Grid int. 250 m
Thickness of the Upper Germanic Trias Group
F16
F17
F18
L01
L02
L03
L04
L05
L06
L07
L08
L09
L11
L12
M01
M02
M04
M05
M07
M08
M10
M11
1420
455
250
929
894
1162
553
266
217
1032
1095
622
832
722
622
572
549
189189
267
104
30
671
656
2A
Thickness in m
0 - 200
200 - 400
400 - 600
600 - 800
800 - 1000
1000 - 1200
1200 - 1400
1400 - 1600
1600 - 1800
> 1800
not present
fault
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16
km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

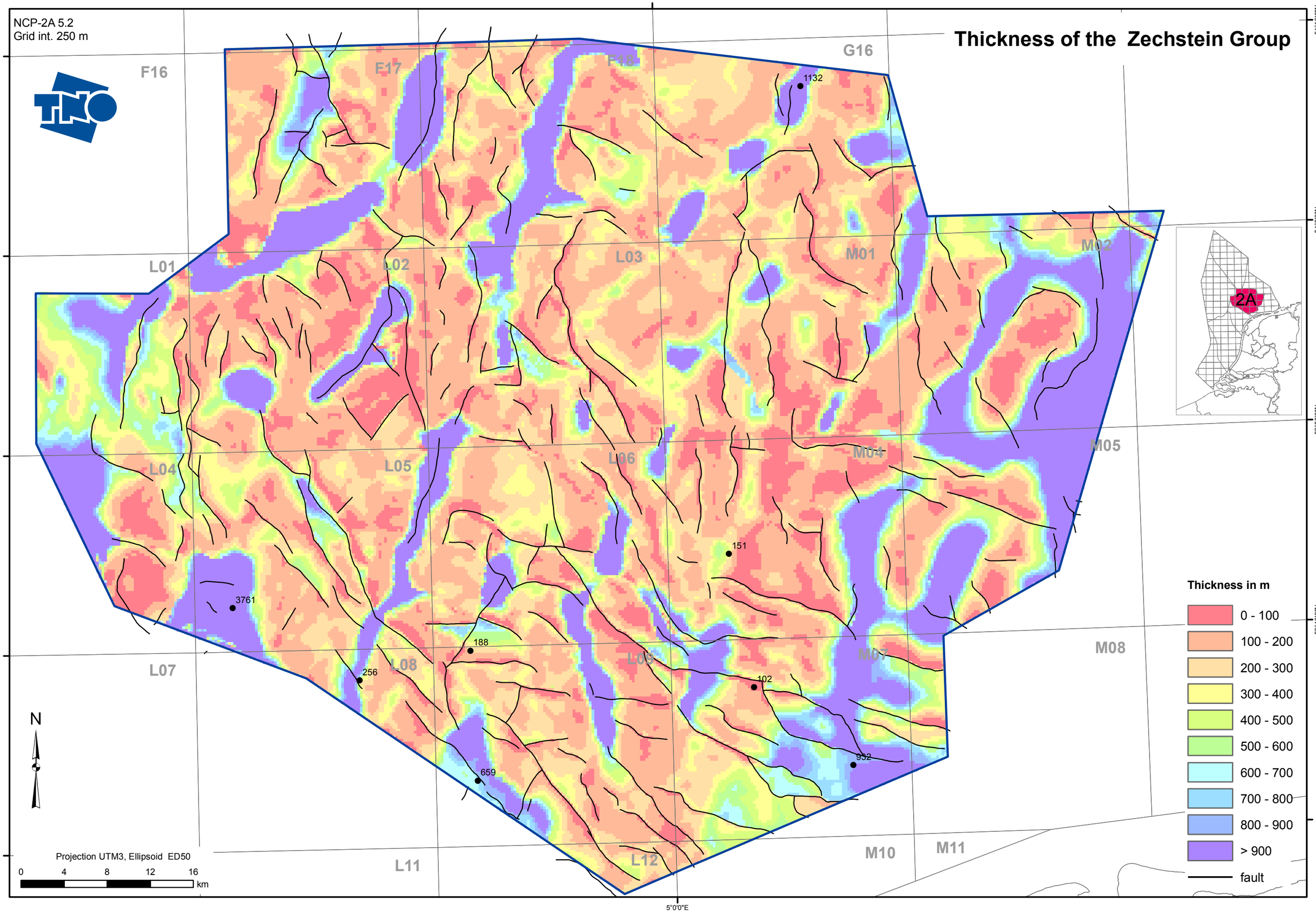
Annex C7

NCP-2A 6.2
Grid int. 250 m

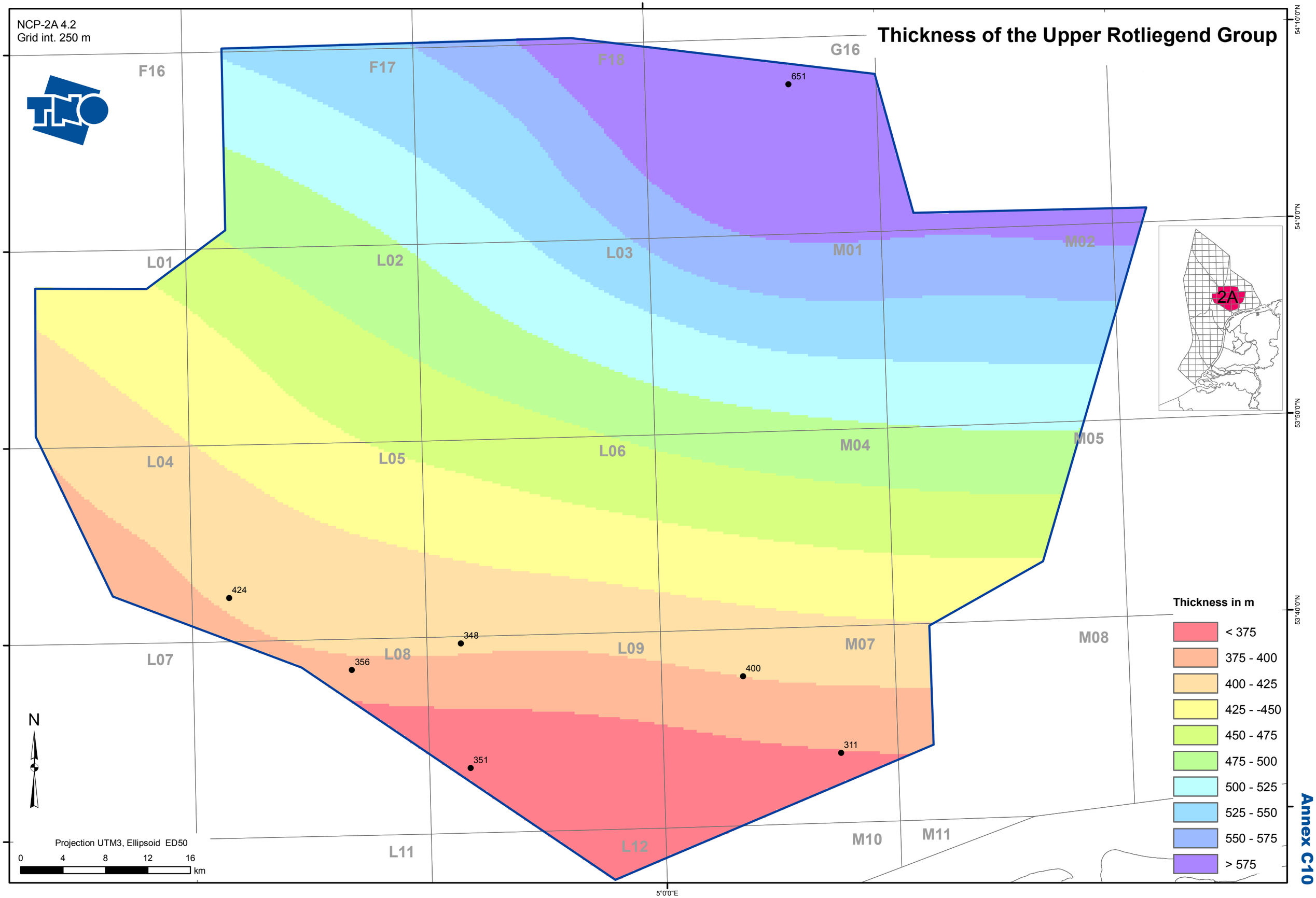
Thickness of the Lower Germanic Trias Group



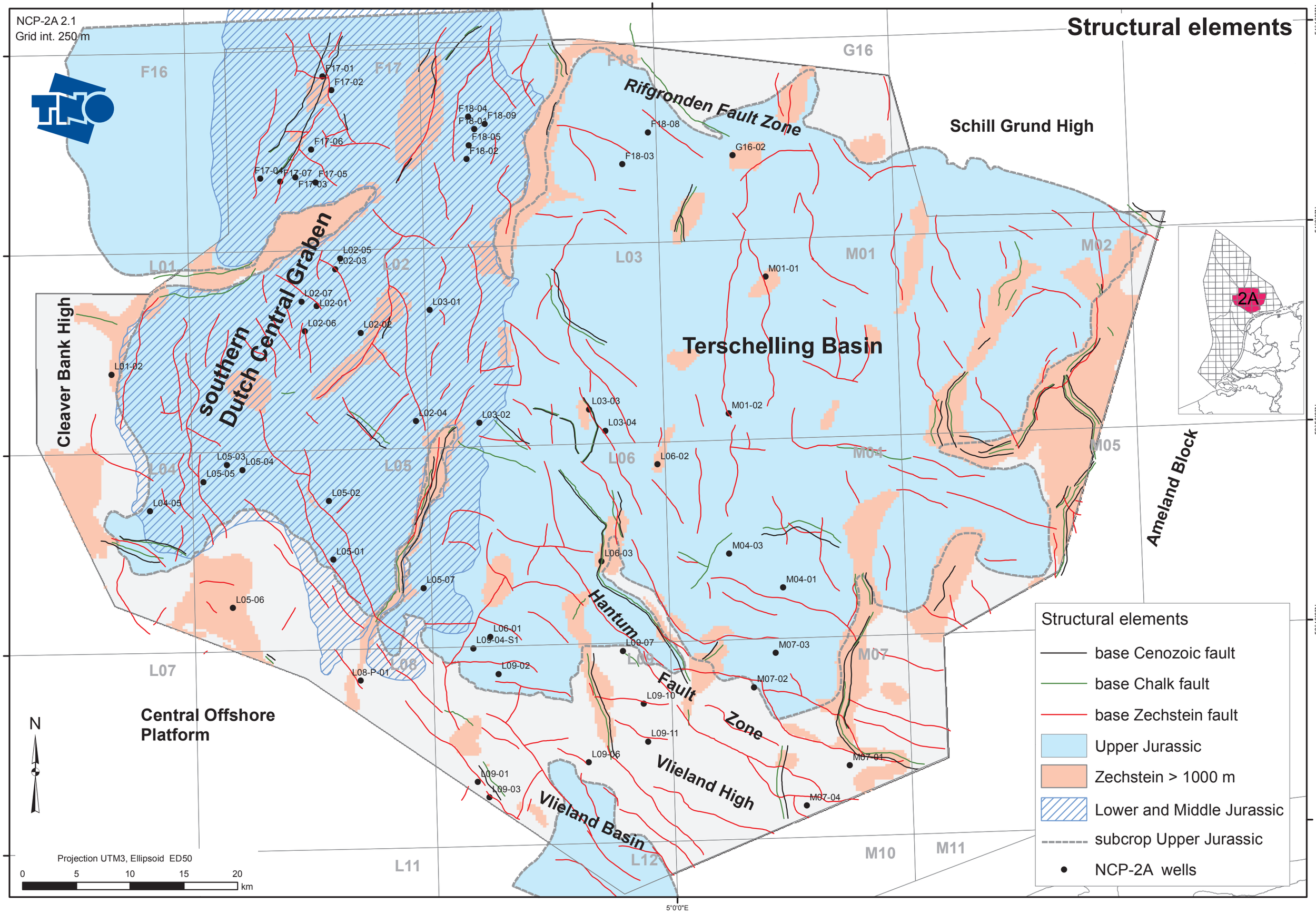
Annex C8


NCP-2A 5.2
Grid int. 250 m
Thickness of the Zechstein Group
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
1132
151
3761
188
256
102
932
659
2A
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16 km
Thickness in m
0 - 100
100 - 200
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
> 900
fault
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

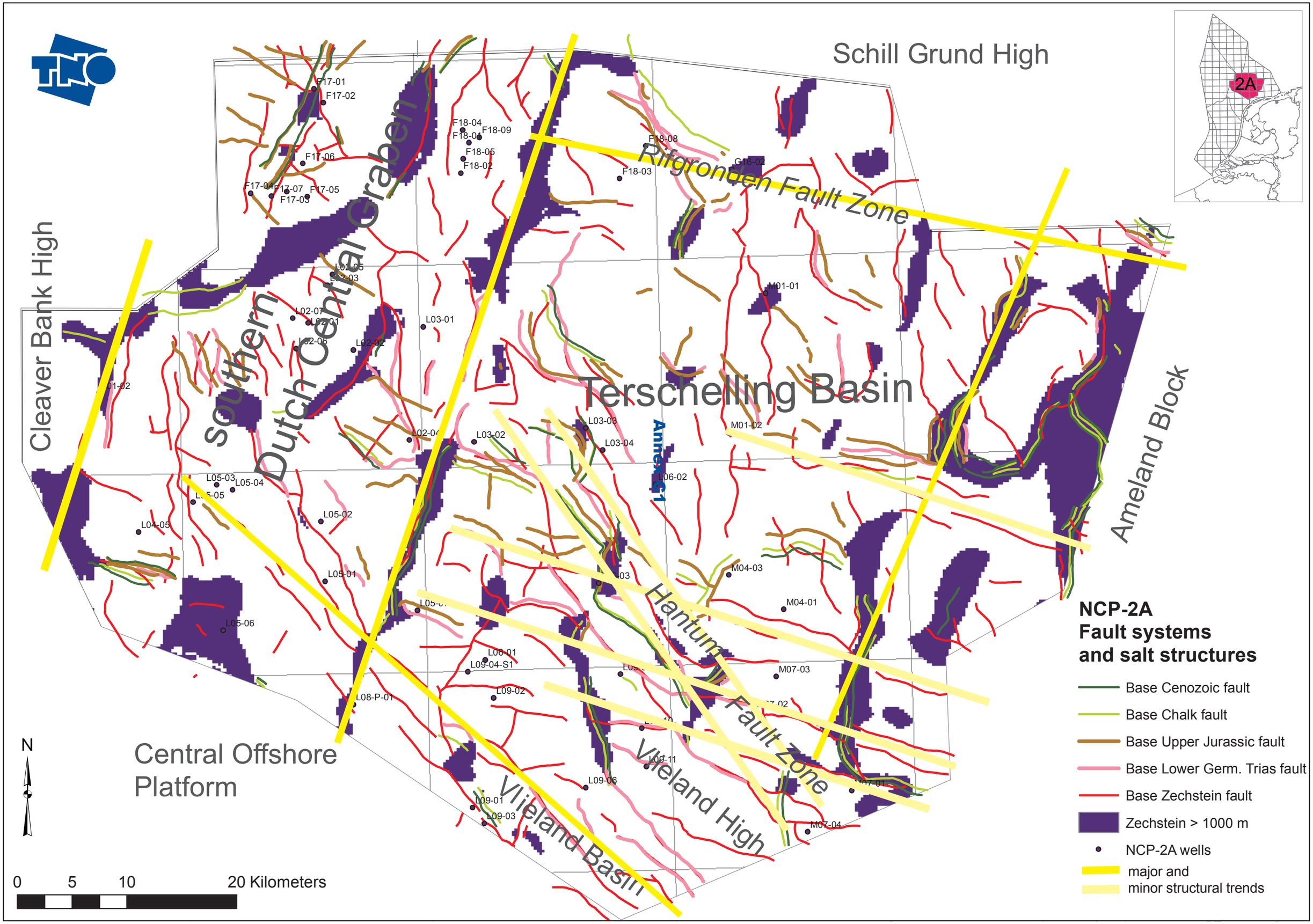
Annex C9


NCP-2A 4.2
Grid int. 250 m
Thickness of the Upper Rotliegend Group
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
651
424
348
356
400
311
351
2A
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16
km
Thickness in m
< 375
375 - 400
400 - 425
425 - -450
450 - 475
475 - 500
500 - 525
525 - 550
550 - 575
> 575
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

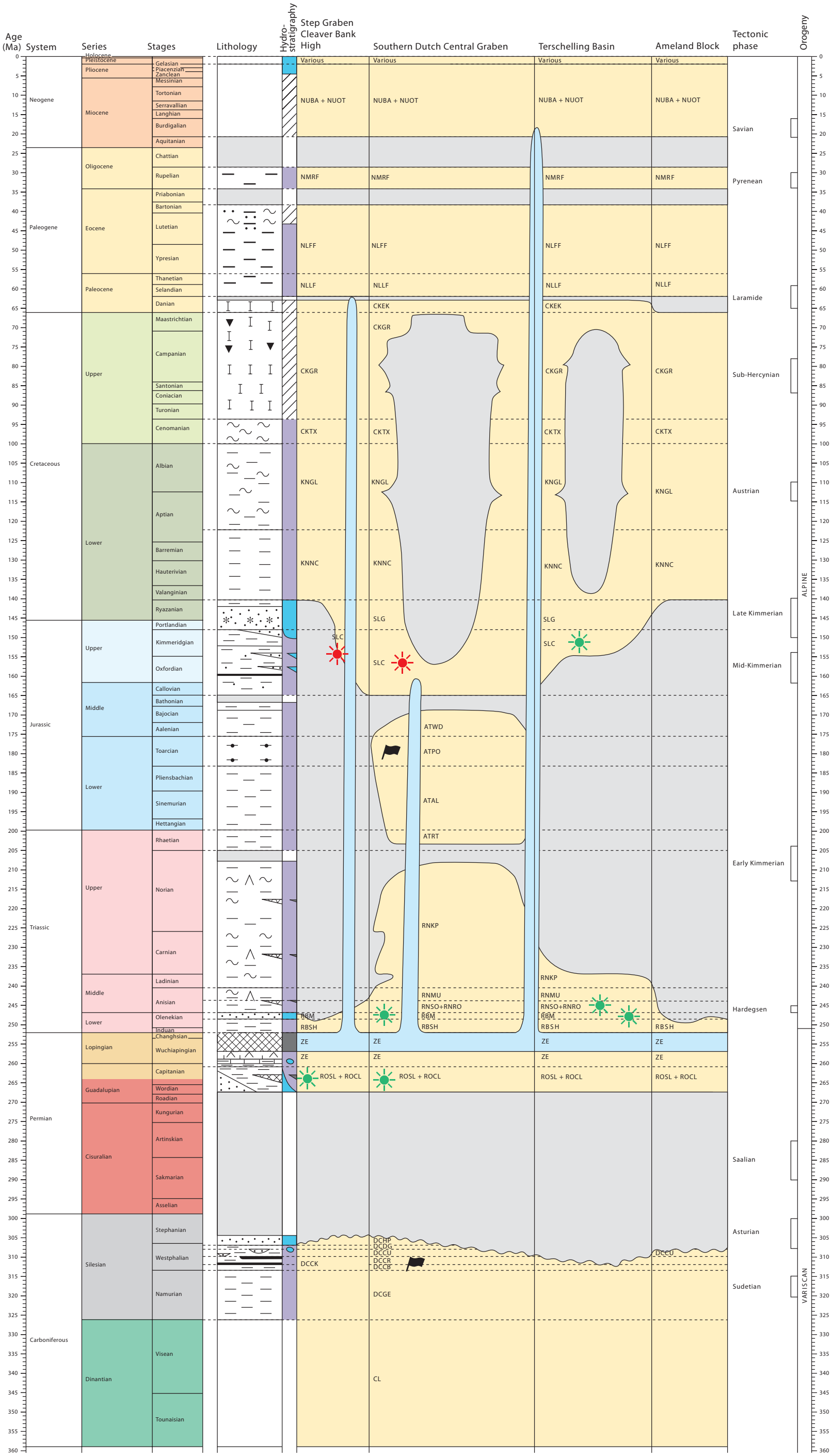
Annex C10


NCP-2A 2.1
Grid int. 250 m
Structural elements
Rifgronden Fault Zone
Schill Grund High
Terschelling Basin
Southern Dutch Central Graben
Cleaver Bank High
Ameland Block
Hantum Fault Zone
Vlieland High
Vlieland Basin
Central Offshore Platform
F16
F17
F18
G16
L01
L02
L03
L04
L05
L06
L07
L08
L09
L11
L12
M01
M02
M04
M05
M07
M10
M11
F17-01
F17-02
F17-06
F17-04
F17-07
F17-05
F17-03
F18-04
F18-09
F18-05
F18-02
F18-08
F18-03
G16-02
L02-05
L02-03
L02-07
L02-01
L02-06
L02-02
L03-01
L01-02
L02-04
L03-02
L03-03
L03-04
M01-01
M01-02
L05-03
L05-04
L05-05
L04-05
L05-02
L05-01
L05-07
L05-06
L06-02
L06-03
M04-03
M04-01
L06-01
L09-04-S1
L09-07
L09-02
L08-P-01
M07-03
M07-02
L09-10
L09-11
L09-06
L09-01
L09-03
M07-01
M07-04
2A
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E
Structural elements
base Cenozoic fault
base Chalk fault
base Zechstein fault
Upper Jurassic
Zechstein > 1000 m
Lower and Middle Jurassic
subcrop Upper Jurassic
NCP-2A wells

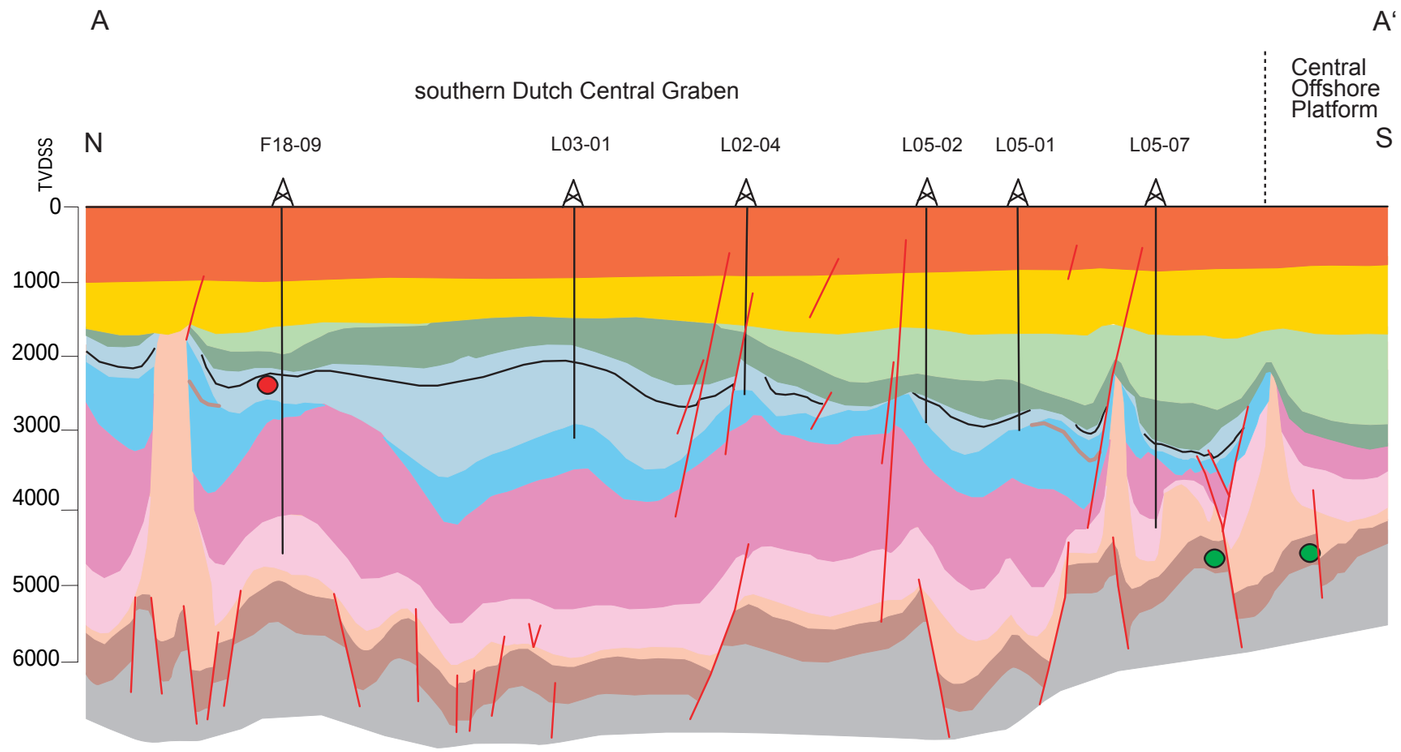
Annex D

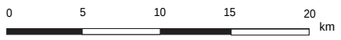

Schill Grund High
2A
Cleaver Bank High
Southern Dutch Central Graben
Rifgronden Fault Zone
Terschelling Basin
Ameland Block
Annex C1
Hantum Fault Zone
Vlieland High
Vlieland Basin
Central Offshore Platform
F17-01
F17-02
F17-06
F17-04
F17-07
F17-05
F17-03
F18-04
F18-09
F18-06
F18-05
F18-02
F18-08
F18-03
G16-02
L02-05
L02-03
L02-07
L02-01
L02-06
L02-02
L03-01
M01-01
L03-03
L03-04
L02-04
L03-02
M01-02
L06-02
L05-03
L05-04
L05-05
L05-02
L04-05
L05-01
L05-06
M04-03
M04-01
L06-01
L09-04-S1
L09-02
L08-P-01
M07-03
L09-06
L09-01
L09-03
M07-04
N
0 5 10 20 Kilometers
NCP-2A
Fault systems
and salt structures
Base Cenozoic fault
Base Chalk fault
Base Upper Jurassic fault
Base Lower Germ. Trias fault
Base Zechstein fault
Zechstein > 1000 m
NCP-2A wells
major and
minor structural trends

Annex F



Tectono-stratigraphic chart of the Dutch Central Graben and Terschelling Basin. Time scale according to Gradstein et al. (2004).
The subdivision of the Upper Jurassic presented here does not follow the official stratigraphic nomenclature of the Netherlands (Adrichem Boogaert & Kouwe, 1997). In this study the Schieland Group (SL) is subdivided into the Scruff subgroup (SLG) and the Central Graben subgroup (SLC).
The Scruff subgroup relates to the former Scruff Group while the Central Graben subgroup relates to the former Schieland Group.

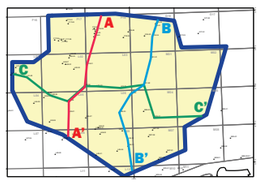




oil
gas
fault

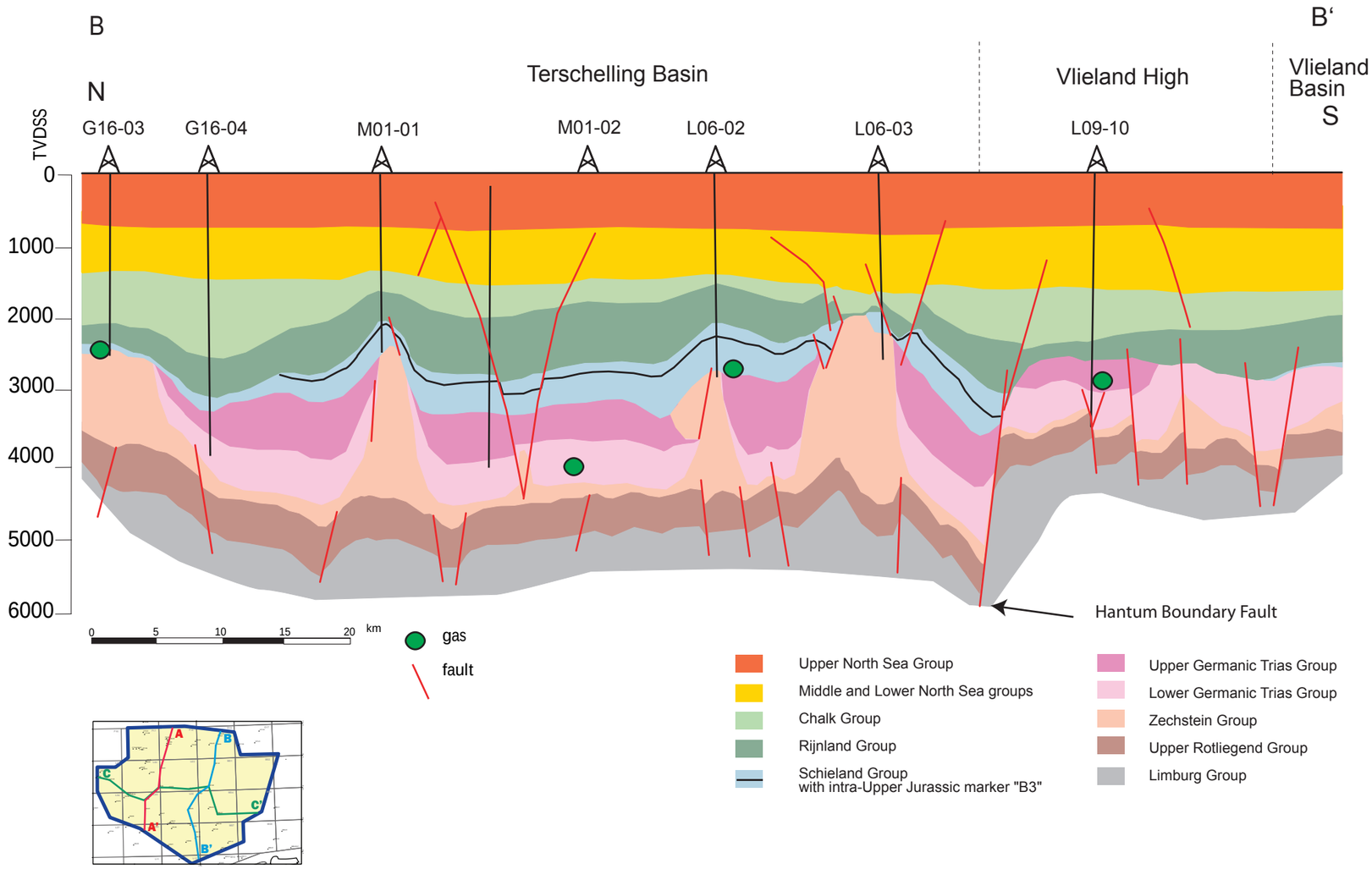
Upper North Sea Group
Middle and Lower North Sea groups
Chalk Group
Rijnland Group
Schieland Group
with intra-Upper Jurassic marker "B3"

Altena Group with Posidonia Shale Fm
Upper Germanic Trias Group
Lower Germanic Trias Group
Zechstein Group
Upper Rotliegend Group
Limburg Group

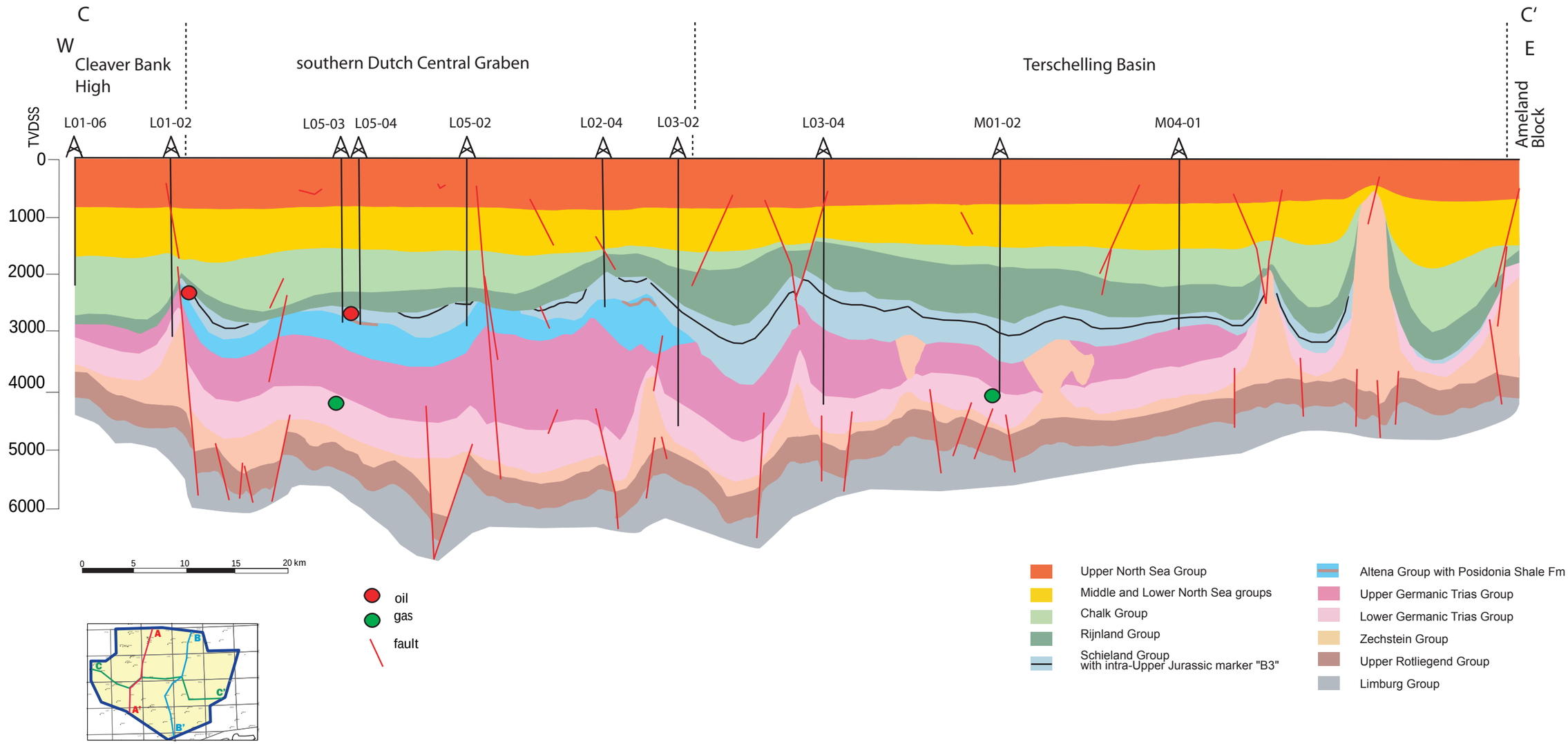


Cross section A-A'
This geological profile runs N-S through the southern part of the Dutch Central Graben where both Lower and Upper Jurassic deposits are present. Both oil and gas fields are found in this area. Major faulting occurred in t he area of the Hantum Boundary Fault from Carboniferous until Tertiary age.

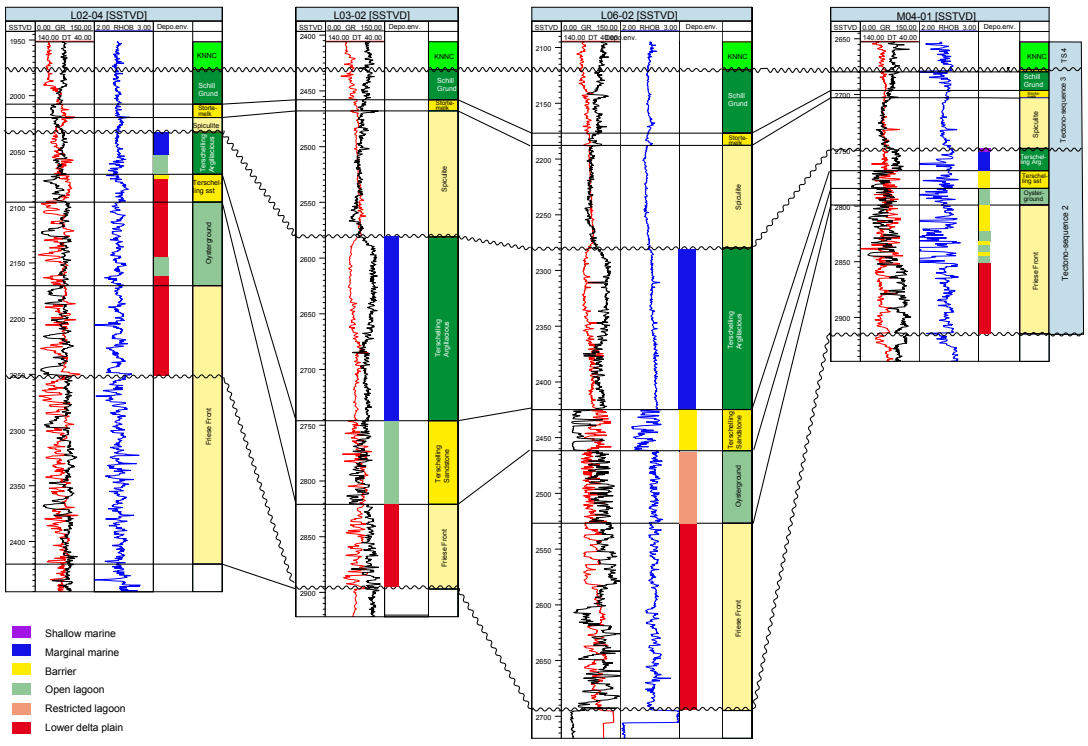
Annex G1

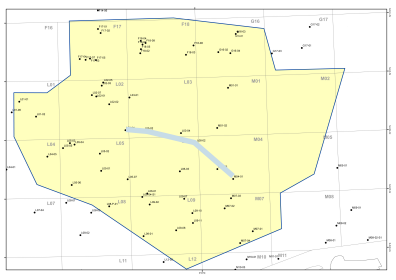


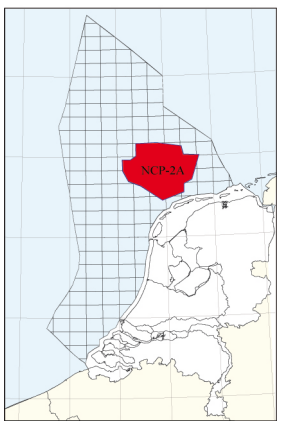
Cross section B-B'
This geological profile runs N-S through the Terschelling Basin where Upper Jurassic deposits are present.
Salt structures are present through the basin and have developed many hydrocarbon reservoirs (and prospects),
i.e. Upper Rotliegend in the south and Triassic and Upper Jurassic throughout the Terschelling Basin.



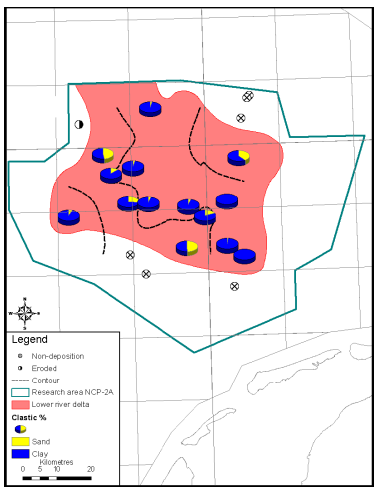
Cross section C-C'
This W-E geological profile shows the structural configuration in the southern Dutch Central Graben and the Terschelling Basin.
In the N-S trending Dutch Central Graben Lower Jurassic deposits are found up to a thickness of more than 1000m.
In the Terschelling Basin Lower Jurassic deposits are absent. Thick Upper Jurassic deposits are found in the Terschelling Basin (Profile NCP 2A West-East).
The Upper Rotliegend and the base of the Zechstein have faulted intensively, compared to the post-Zechstein sequence.



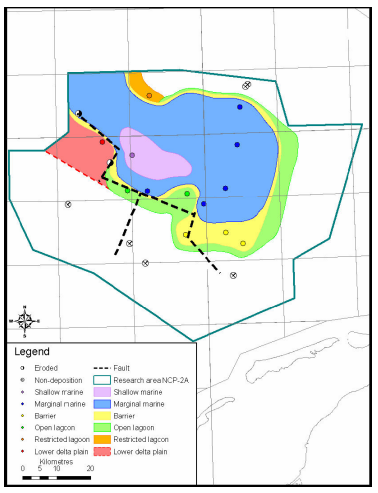




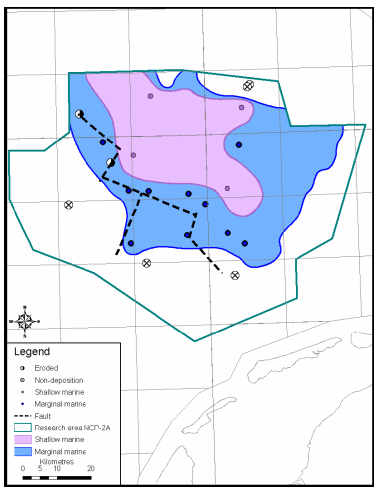
This correlation panel stems from the sedimentological study performed in 'tectono-stratigraphic unit 2' in the UpperJurassic. TNO report 2006-U-R0191/A.
It shows the lithostratigraphic correlation in both tectono-sequence 2 and 3 as well as an indication of the depositional environment. In these wells (from bottom to top) the depositional environment shifts from lower delta plain in the Friese Front Fm (bottom TS 2) to lagoonal and barrier sand to marginel to shallow marine to the top of sequence 2.



Initial stage

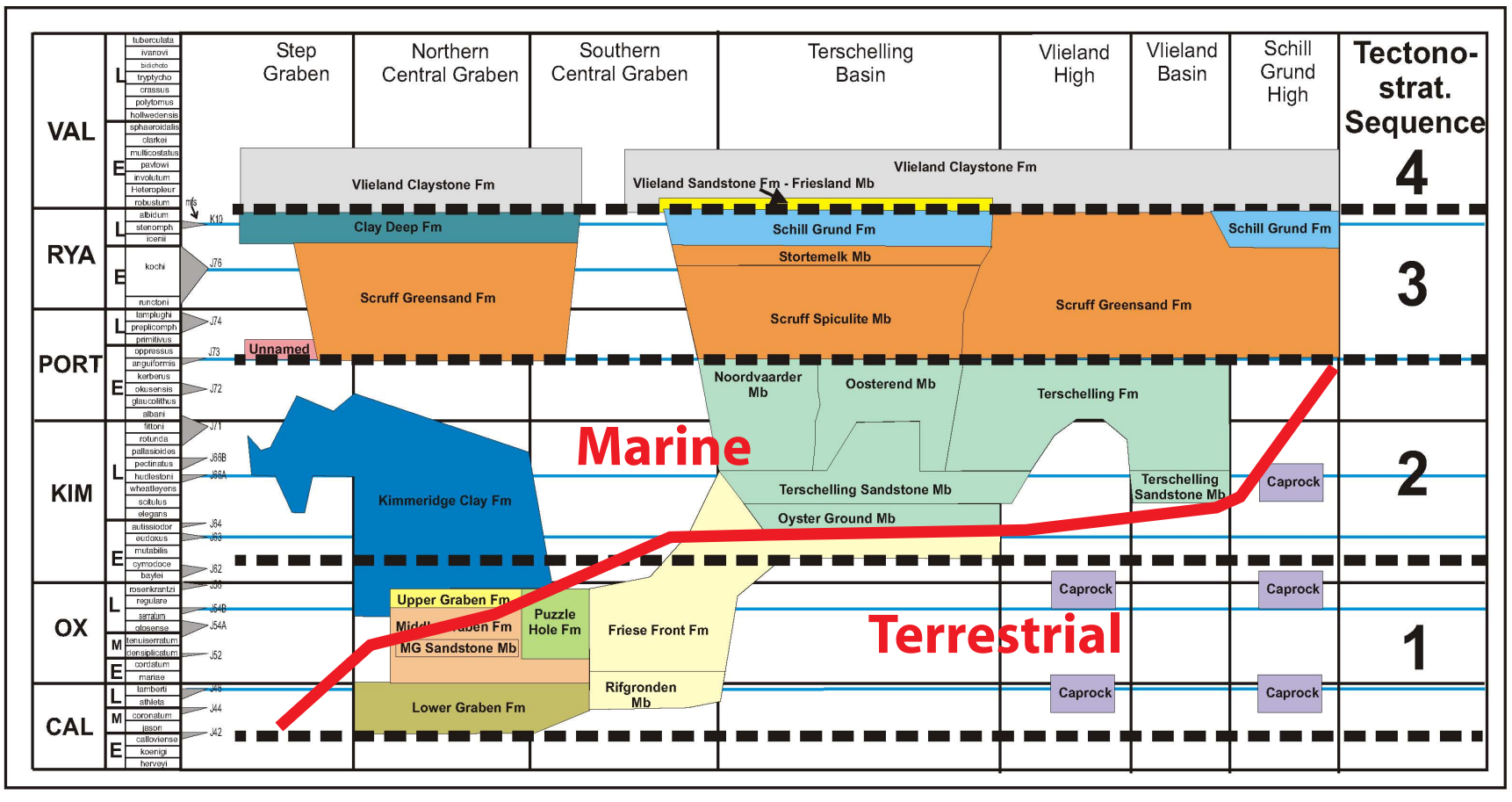


middle stage

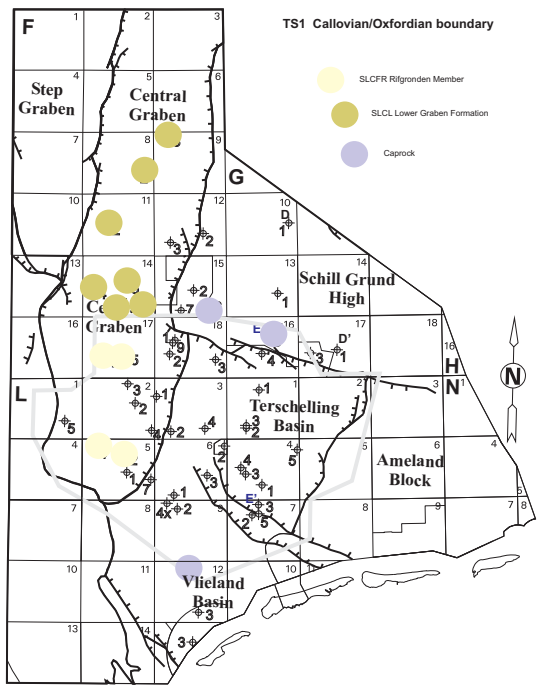


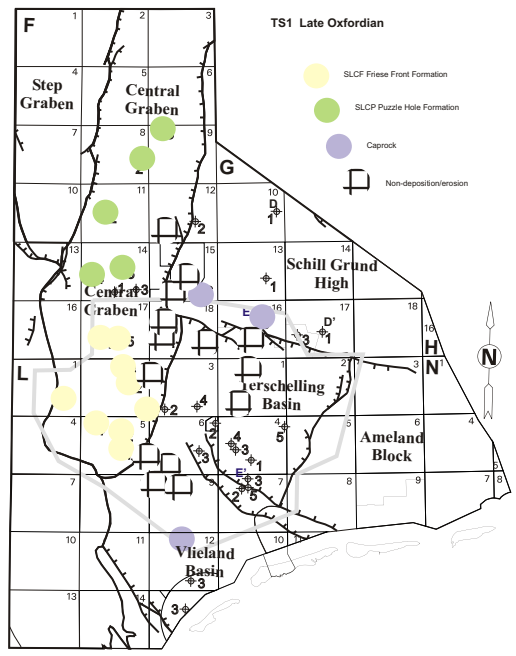
finale stage

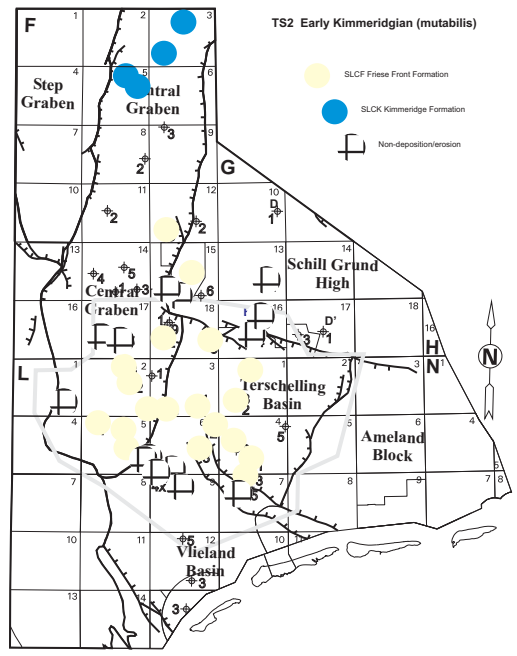
The results show the excistence of 5 depositional environments: 1. delta plain, 2. restricted lagoon, 3. open lagoon, 4. barrier system and 5. shallow marine.
After construction of the thickness maps, three time slices were created that show a shift from delta plain deposits in time slice 1, developing into a complex delta plain deposits, grading into lagoonal, barrier and shallow marine deposits in time slice 2, and the final stage with only marginal to shallow marine deposits.

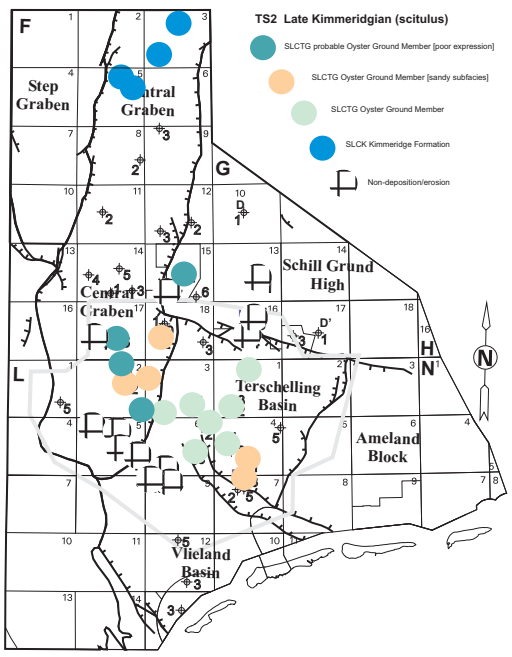


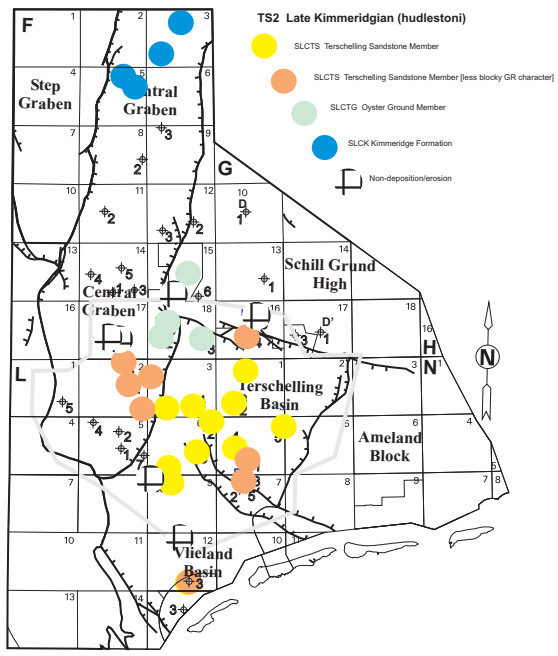
In the biostratigraphic study a tectono-stratigraphic framework was constructed for this area and an attempt was made to create a new subdivision for the Upper Jurassic sediments in junction with and elaboration of Abbink et al. (2006). Initially a distinction was made between the terrestrial and marine deposits, resulting in a Schieland Group comprising a Central Graben subgroup (terrestrial) excluding e.g. the marine Terschelling Sandstone Member and a Scruff subgroup for all marine sediments. Many problems were encountered and finally the decision was made to wait with a new subdivision until all Upper Jurassic-Lower Cretaceous basins are mapped. After finishing this offshore mapping program in 2010, a separate, profound study will be executed. As a result some of the naming of the groups, subgroups and formations are not conform the Nomenclature by Van Adrichem Boogaert and Kouwe 1992-1997). The notion, however, will be clear.

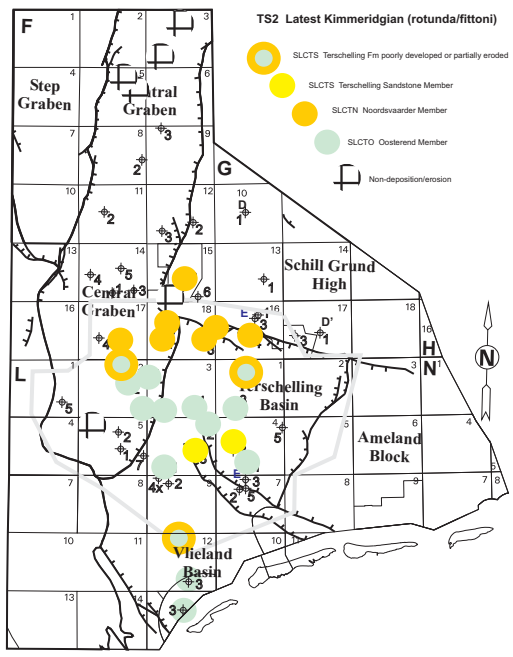


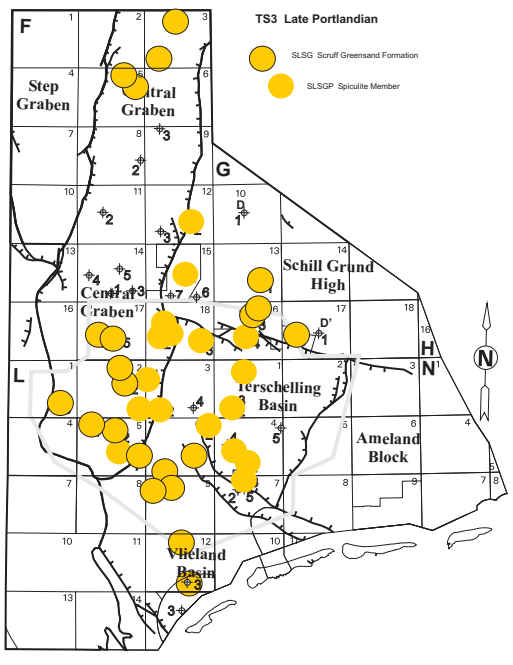


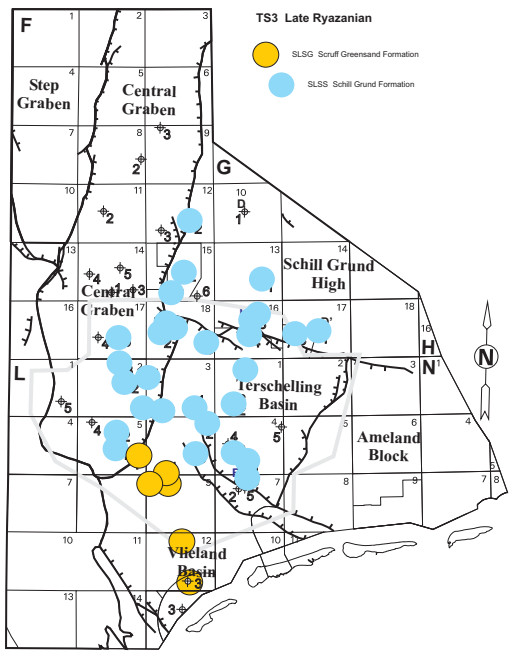






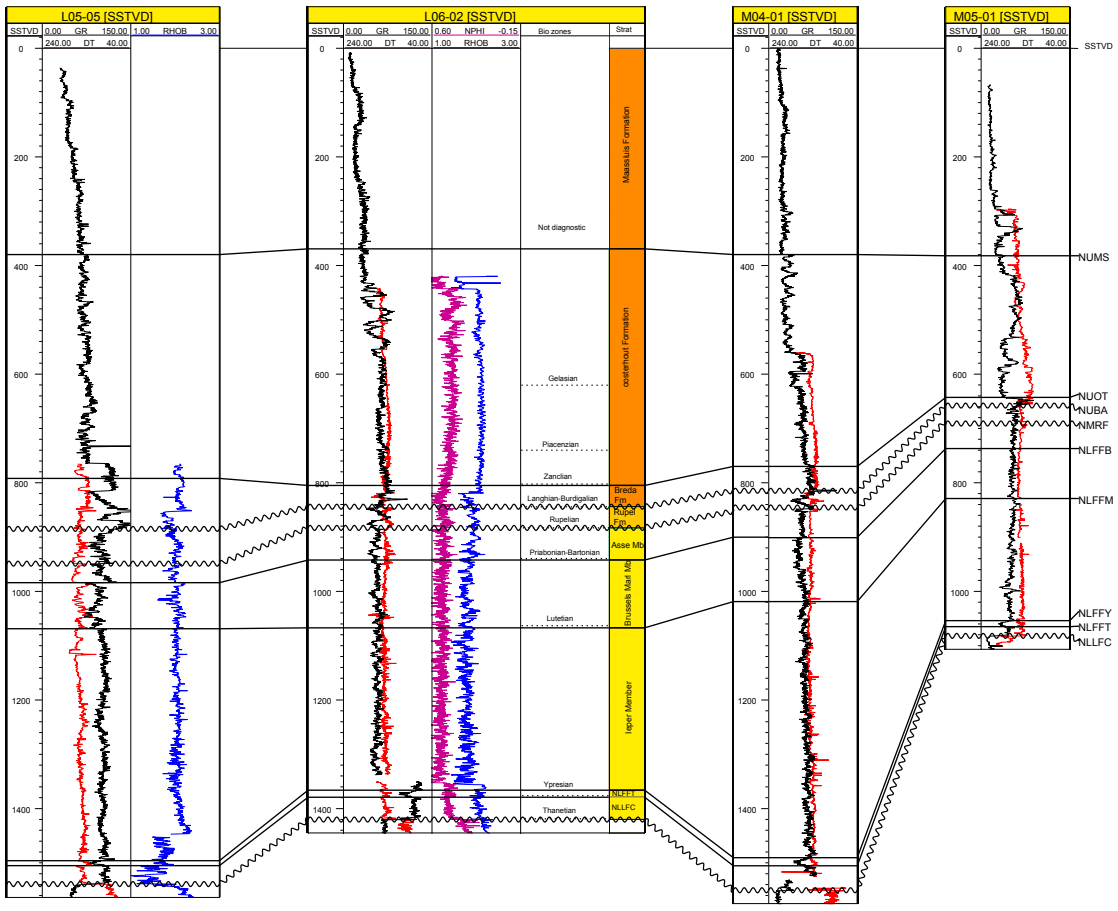


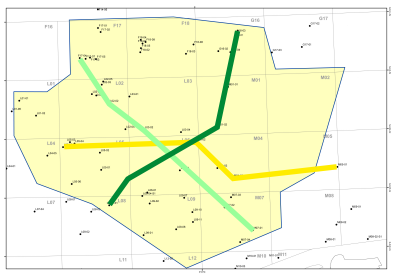




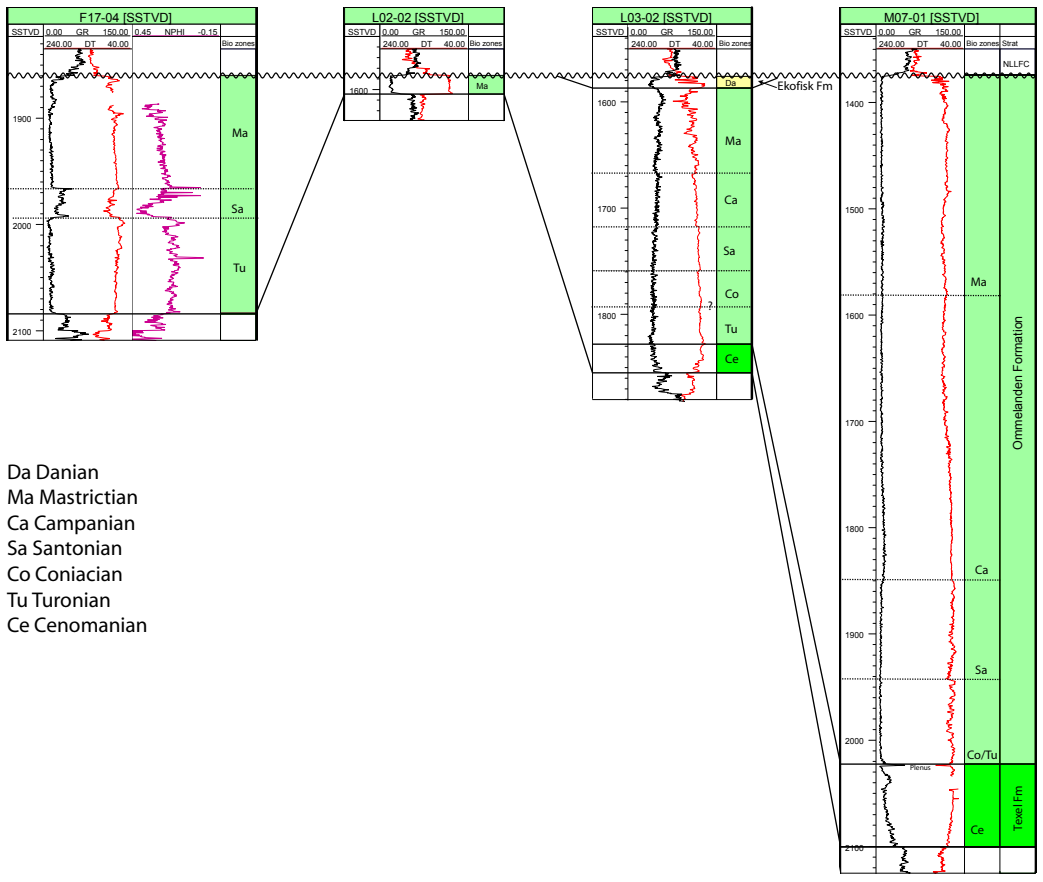
In the biostratigraphic study eight time slices were constructed.
The names of the members can be found in the tectonostratigraphic chart on the former page and do not correspond to the Stratigraphic nomenclature by Van Adrichem Boogarert & Kouwe 1992-1997.

Correlation panels in area 2A



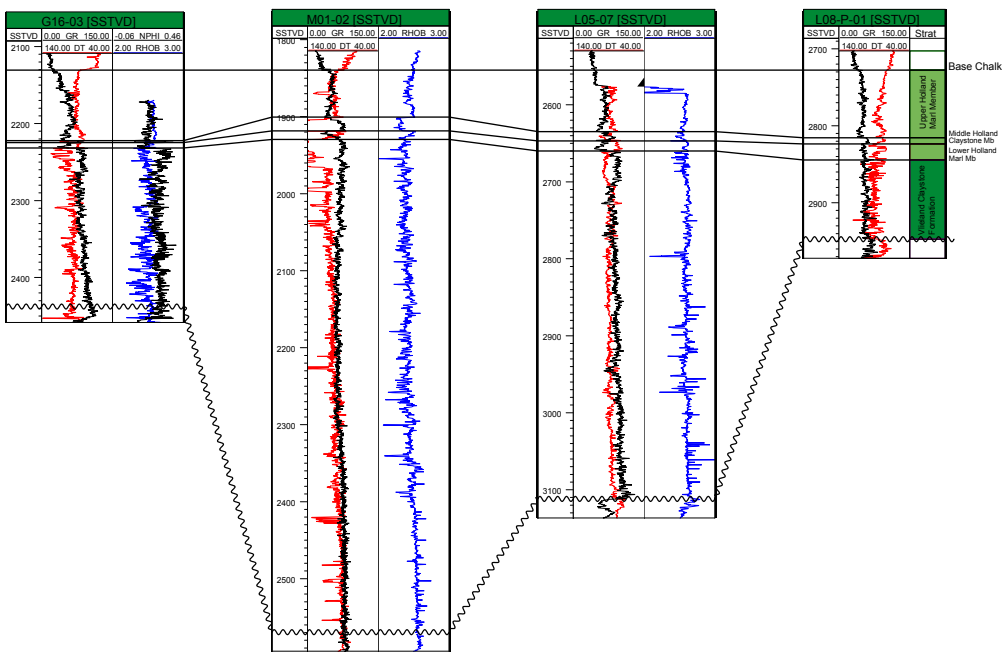


The correlation panel of the Lower, Middle and Upper North Sea groups shows a uniform development with a thinning in eastern direction.
The Pyrenean and Savian erosional phases have removed part of the Oligocene and Lower to Middle Miocene deposits. Note the thick Pliocene sequence with stacked pro-delta sands which originate from the Eridanos river system.



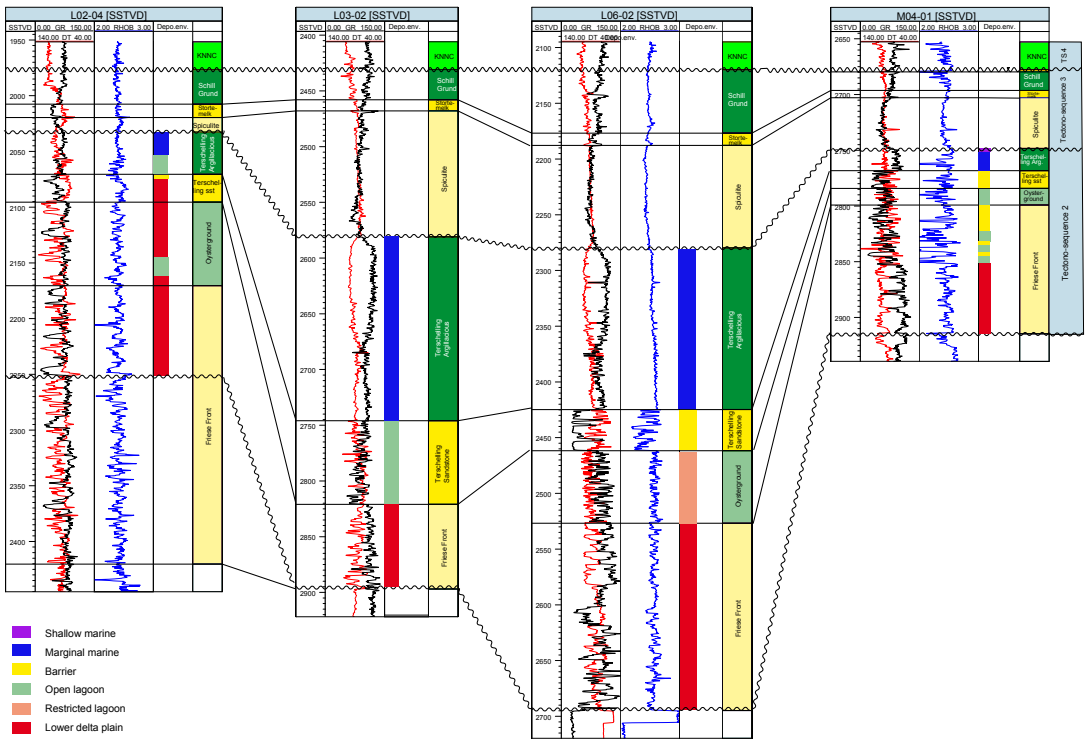
Da Danian
Ma Mastrictian
Ca Campanian
Sa Santonian
Co Coniacian
Tu Turonian
Ce Cenomanian

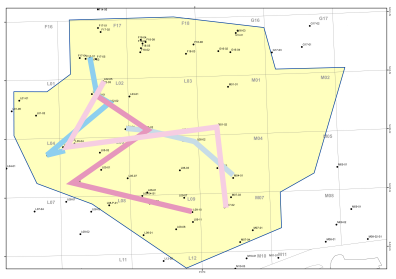
This correlation panel of the Chalk Group shows a cross section over the inversion axis in the Dutch Central Graben. In this panel with only Danian deposits are present in well L02-02
Note the aberrant facies in the Santonian in well F17-04. The interval consists of glauconite rich sandstones.
In L03-02 on the flank of the inverted area a complete but condensed section is present as biostratigraphic analyisis demonstrates.
In M07-01, further to the south, the uppermost Danian stage is not present due to erosion or non-deposition.

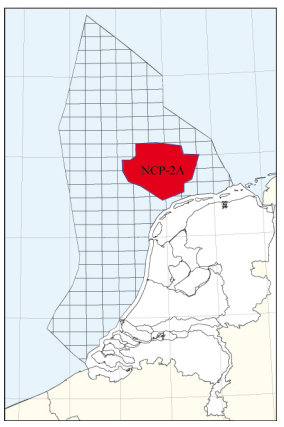


The Vlieland Claystone Formation of the Rijnland Group is mainly a clayey succession and has its greatest thickness in the centre of the Terschelling Basin. The overlying Holland Formation shows a regular succession with the calcareous Lower and Upper Holland Marl members separated by the Middle Holland Claystone Member.

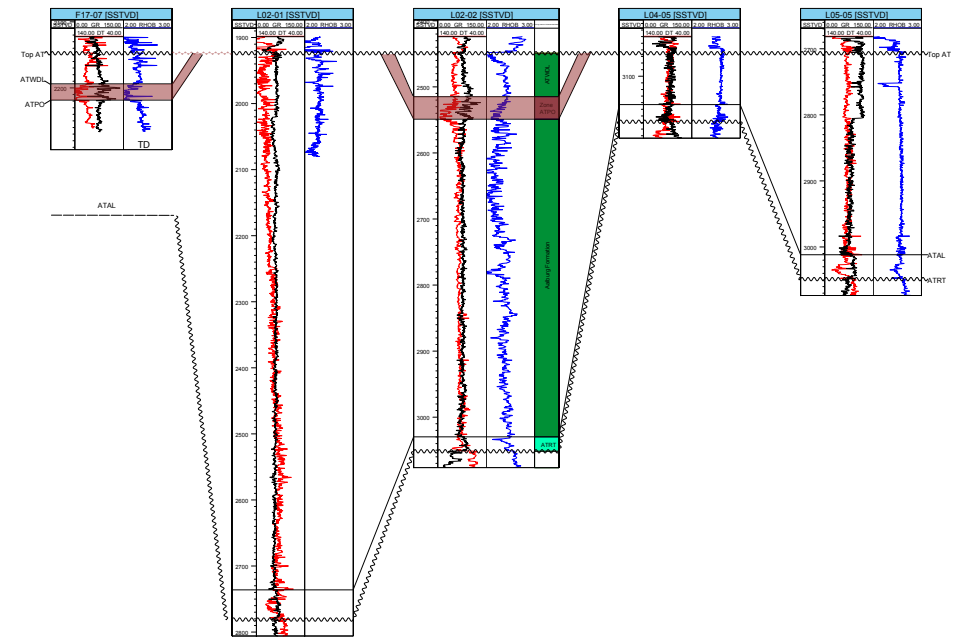
Correlation panels in area 2A



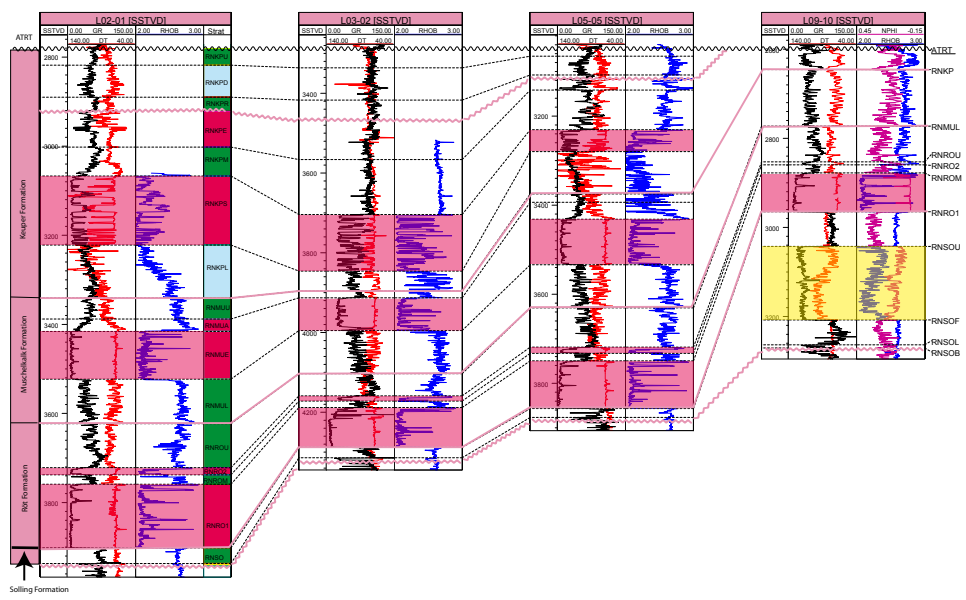




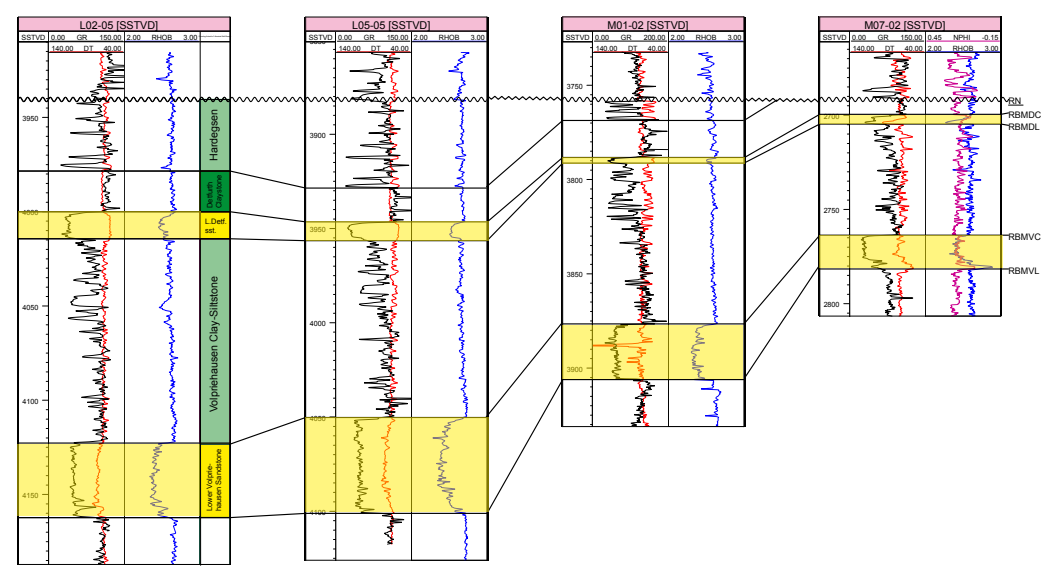
This correlation panel stems from the sedimentological study performed on 'tectono-stratigraphic unit 2' in the UpperJurassic. TNO report 2006-U-R0191/A.
It shows the lithostratigraphic correlation in both tectono-sequence 2 and 3 as well as an indication of the depositional environment. In these wells (from bottom to top) the depositional environment shifts from lower delta plain in the Friese Front Fm (bottom TS 2) to lagoonal and barrier sand to marginal to shallow marine at the top of sequence 2.



The Jurassic sediments of the Altena Group are only present in the Dutch Central Graben. Maximum thickness of almost 900 m is in well reached in well L02-01. The Posidonia Shale Formation isolated spots.
In this correlation panel the Posidonia Shale is shown in two wells. The thickness is about 35 m in L02-02.

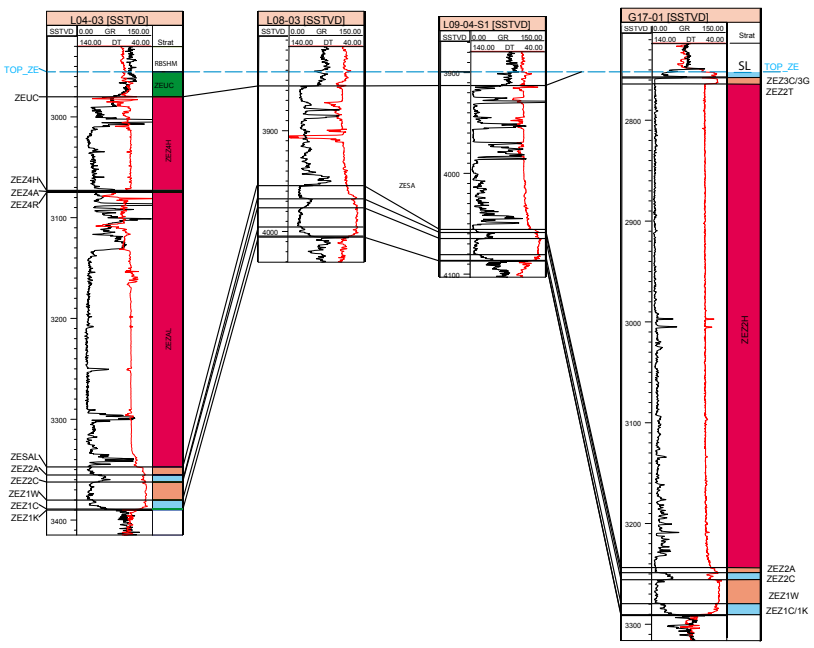


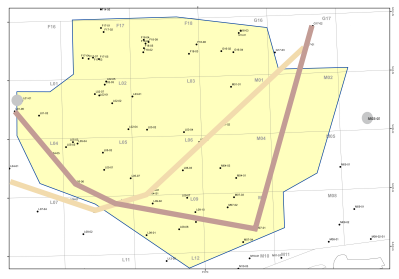
The Upper Germanic Trias Group shows an almost complete succession in well L02-01 in the Dutch Central Graben with a thickness of more than 1150 m. Due to salt movements and later erosion the thickness of the Upper Germanic Trias Group varies enormously in area 2A.
Note the anomalous thick sand deposition in the Solling Forrmation in well L09-10. These eolian sands form an excellent reservoir.

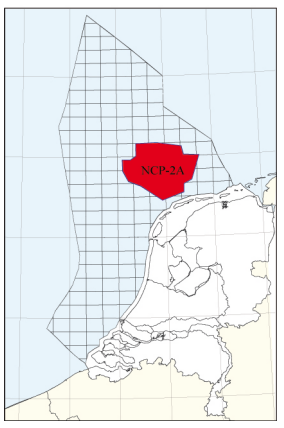


The correlation panel of the Lower Germanic Trias Group only shows the Main Buntsandstein Subgroup. The cross section presents an almost complete section in the Dutch Central Graben area with the Hardegsen Fm present under the base Solling Unconformity. More to the east the unconformity cuts in deeper into the deposits. The Lower Volpriehausen Sandstone and the Lower Detfurth Sandstone members have both good reservoir qualities. Only the Lower Volpriehausen Sandstone is a producing reservoir in area 2A.

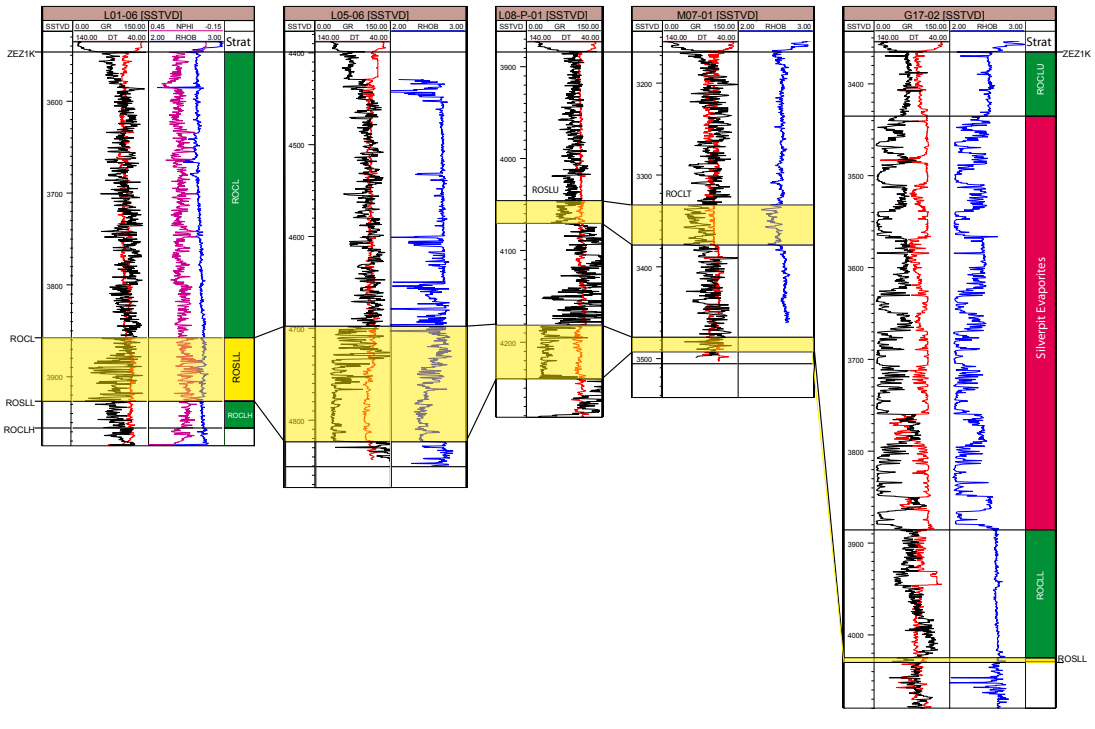
Correlation panels in area 2A



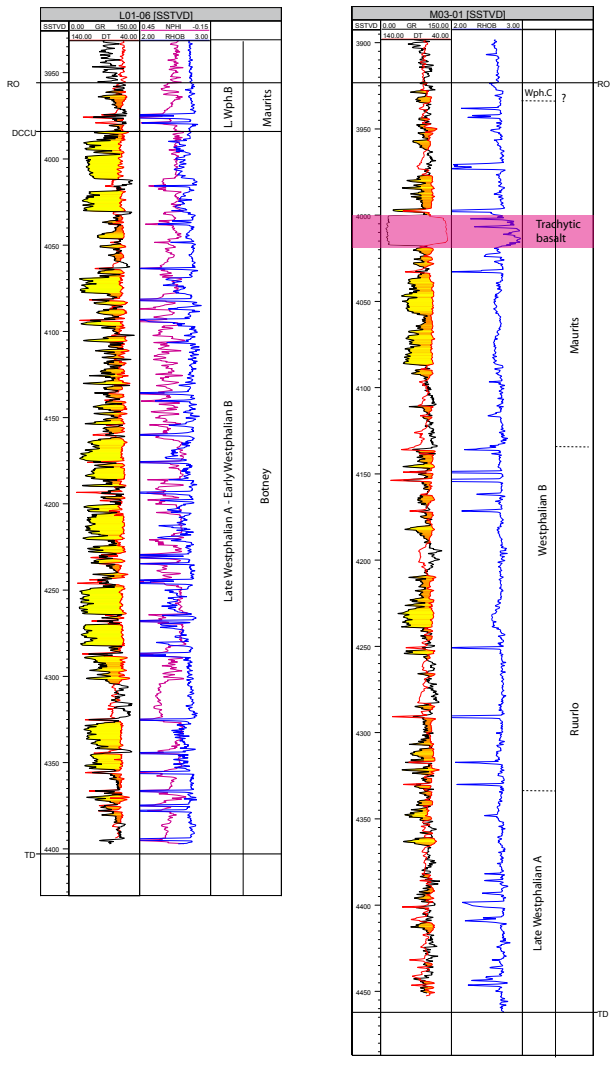




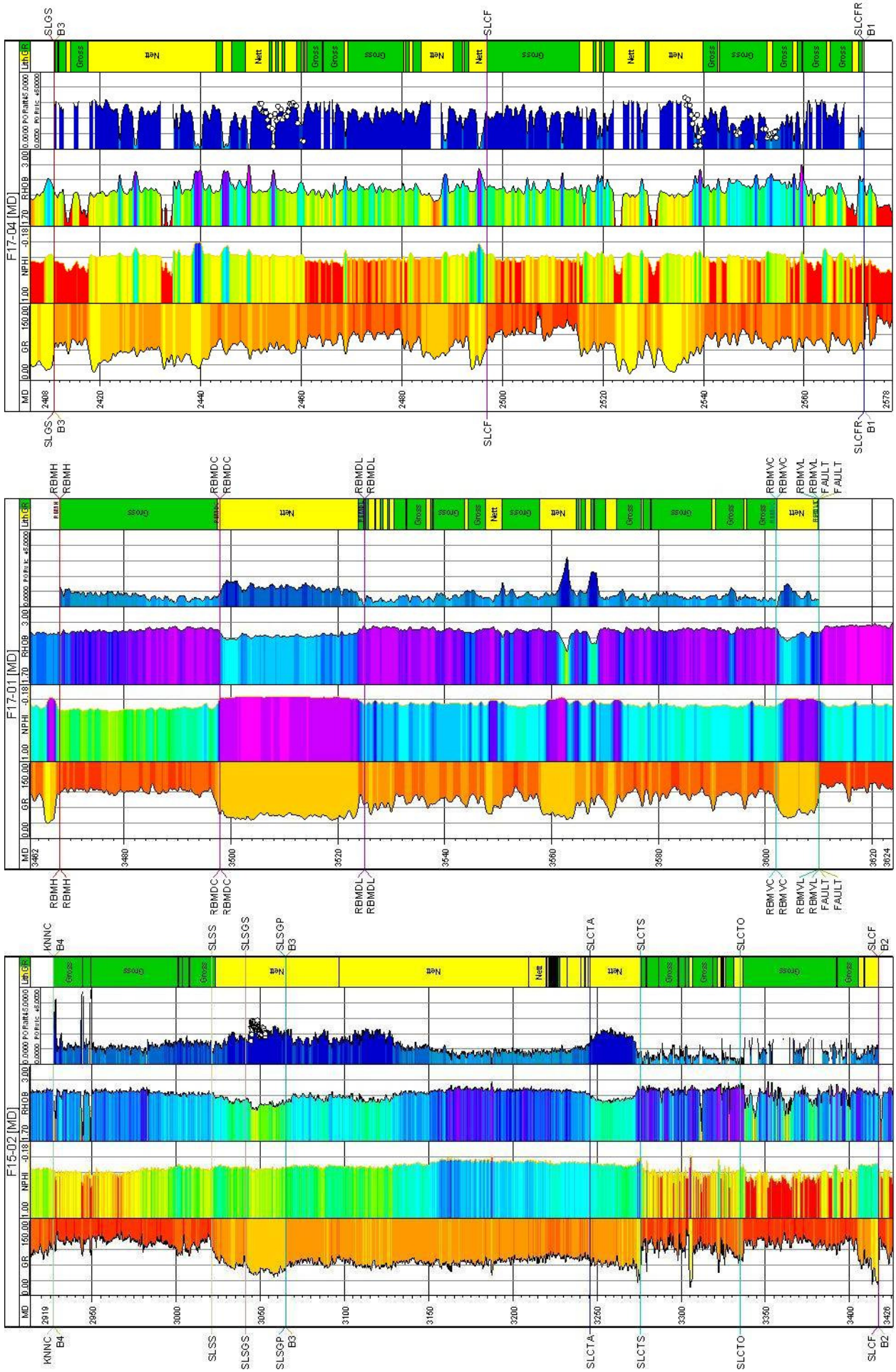
In 2A and surrounding area only few wells have reached base Zechstein Group. Due to halokinese none of them have respresentative examples of a complete cyclic sequence. This cross section shows a possible Zechsein 4 cycle in well L04-03 overlying disturbed Ze2 and Ze3 salt (ZESAL).
In L08-03 and L09-04-S1 a thin salt section represents squeezed out salt to nearby salt domes.
In G17-02, however, a thick Ze2 salt has been preserved with on top Ze3 carbonate, anhydrite and caprock.

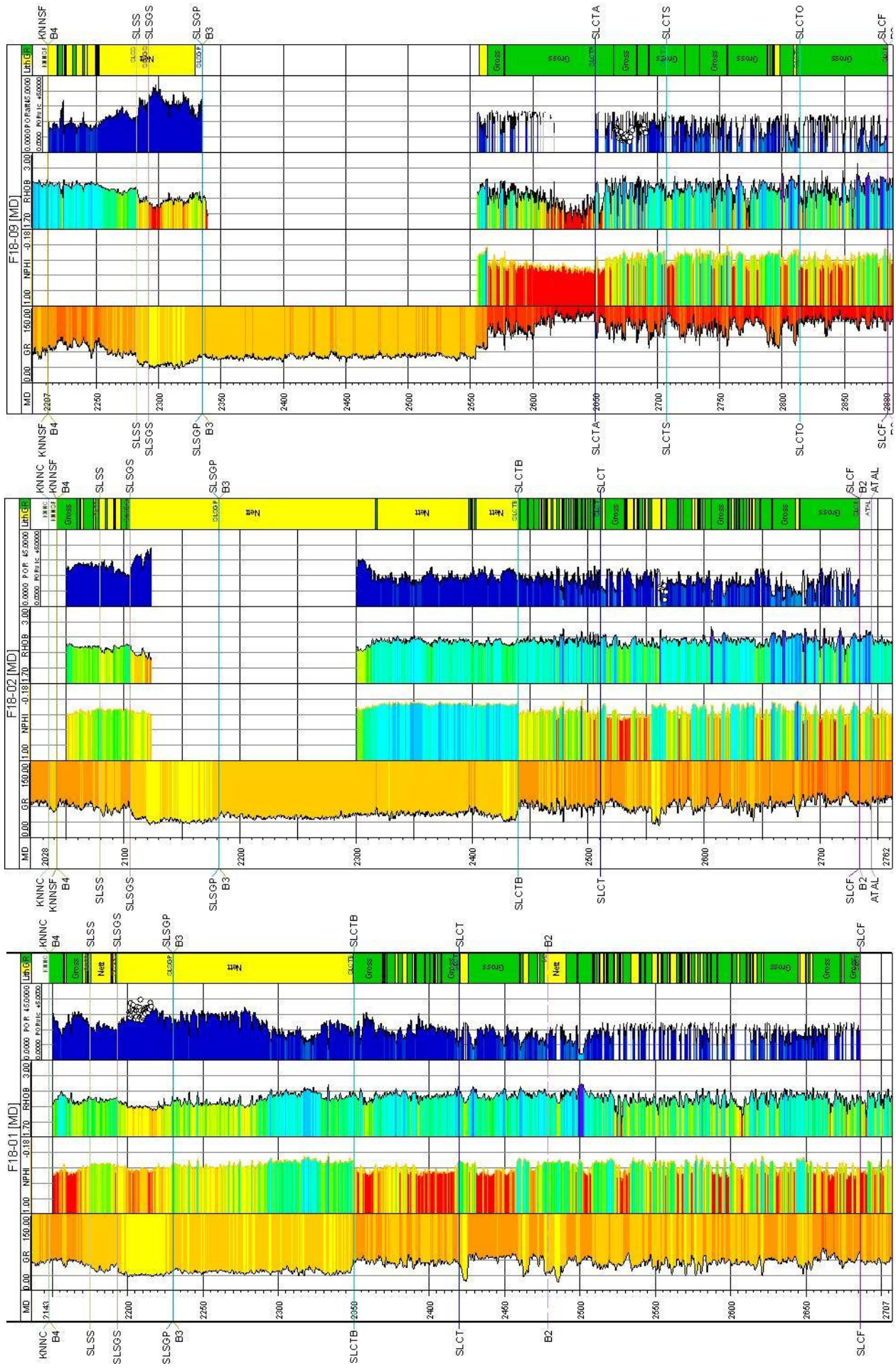


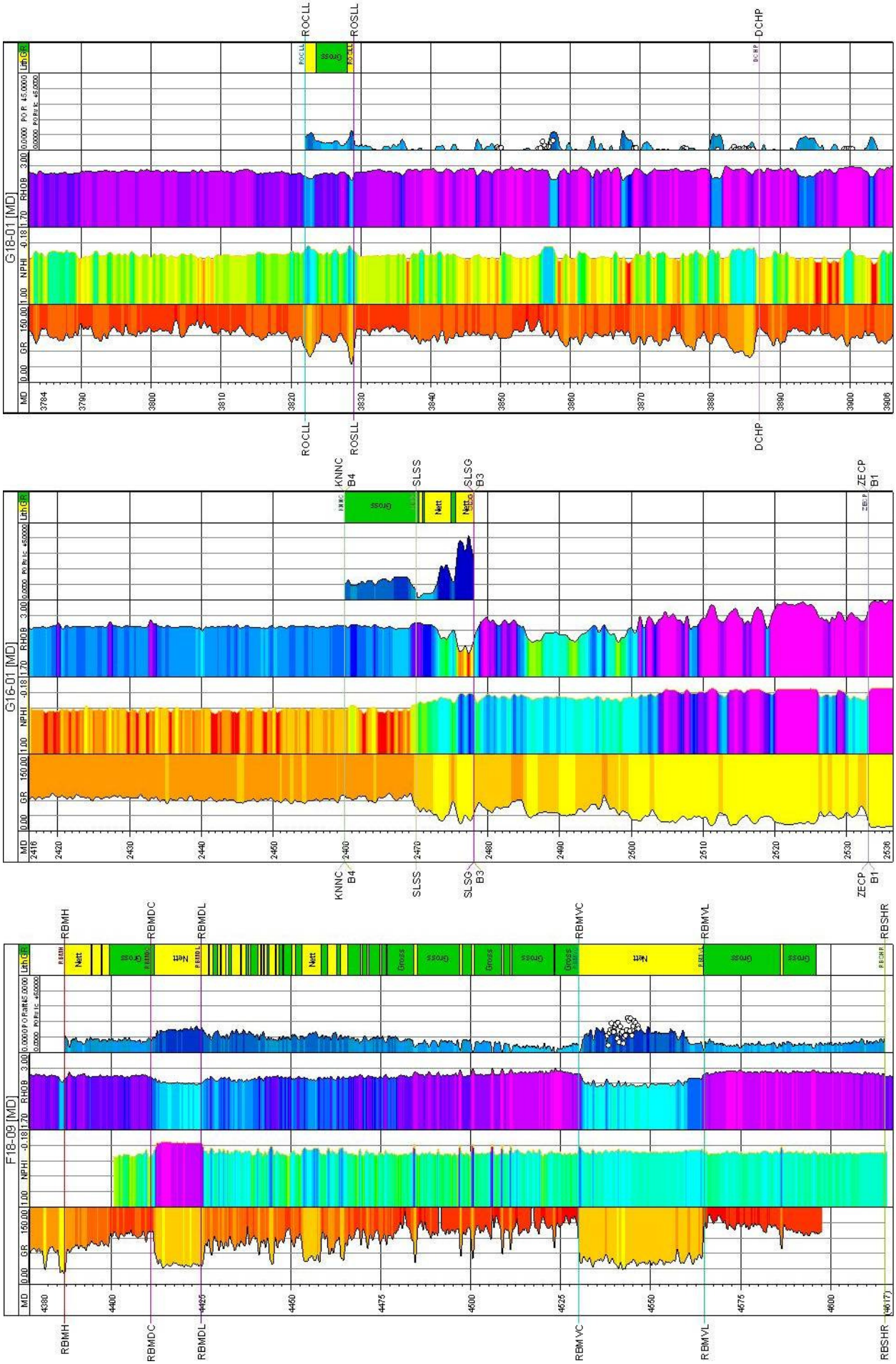
The Slochteren Formation of the Upper Rotliegend Group is present at the southern edge of the area 2A. The fluvial Lower Slochteren Sandstones form an excellent reservoir. The Upper Slochteren Sandstones pinch out in northern direction and harbour no producing fields in area 2A.
The lateral transition to playa/lake deposits of the Silverpit Formation results in a thick Silverpit Evaporites section in well G17-02, just north of the area. At the base a thin layer of Lower Slochteren Sandstone Member is interpreted.
This sand was deposited by a east-west trending river system. The Lower Slochteren Sandstone in the southern part of area 2A has a south-north distributary
(Geluk & Mijnlieff, 2002)



The Limburg Group lies deeply buried in the 2A area. Few wells have reached the top, even fewer wells contain a representative section. Well L01-06 in the western part of the area shows the Botney Member of the Klaverbank Fm with its characteristic stacked sand bodies. Its British equivalent is 'the Caister Sand unit' in the Caister field, one of the major gasfield in the UK.
Biostratigraphic analysis of well M03-01 gives an age of Late Westphalian A to B. At the top evidence is found for Early Westphalian C.
Lithostratigraphically the interval can be divided into Ruurlo and Maurits formations. In the Maurits Formation an intrusive of trachytic basalt is encountered. According to K-Ar dating the dyke originates from Early Jurassic, Pliensbachian.


F17-04 [MD]
F17-01 [MD]
F15-02 [MD]
MD
GR
NPHI
RHOB
Lith GR
Gross
Net
Nett
SLGS B3
SLCF
SLCFR B1
RBMH
RBMDC
RBMDL
RBMVC
RBMVL
FAULT
KNNC B4
SLSS
SLSGS
SLSGP B3
SLCTA
SLCTS
SLCTO
SLCF B2


F18-09 [MD]
F18-02 [MD]
F18-01 [MD]
KNNSF
KNNC
B4
SLSS
SLSGS
SLSGP
B3
SLCTA
SLCTS
SLCTO
SLCTB
SLCT
B2
SLCF
ATAL
Gross
Net
LithGR
POR
RHOB
NPHI
GR
MD


G18-01 [MD]
ROCLL
ROSLL
DCHP
Gross
G16-01 [MD]
KNNC B4
SLSS
SLSG B3
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Nett
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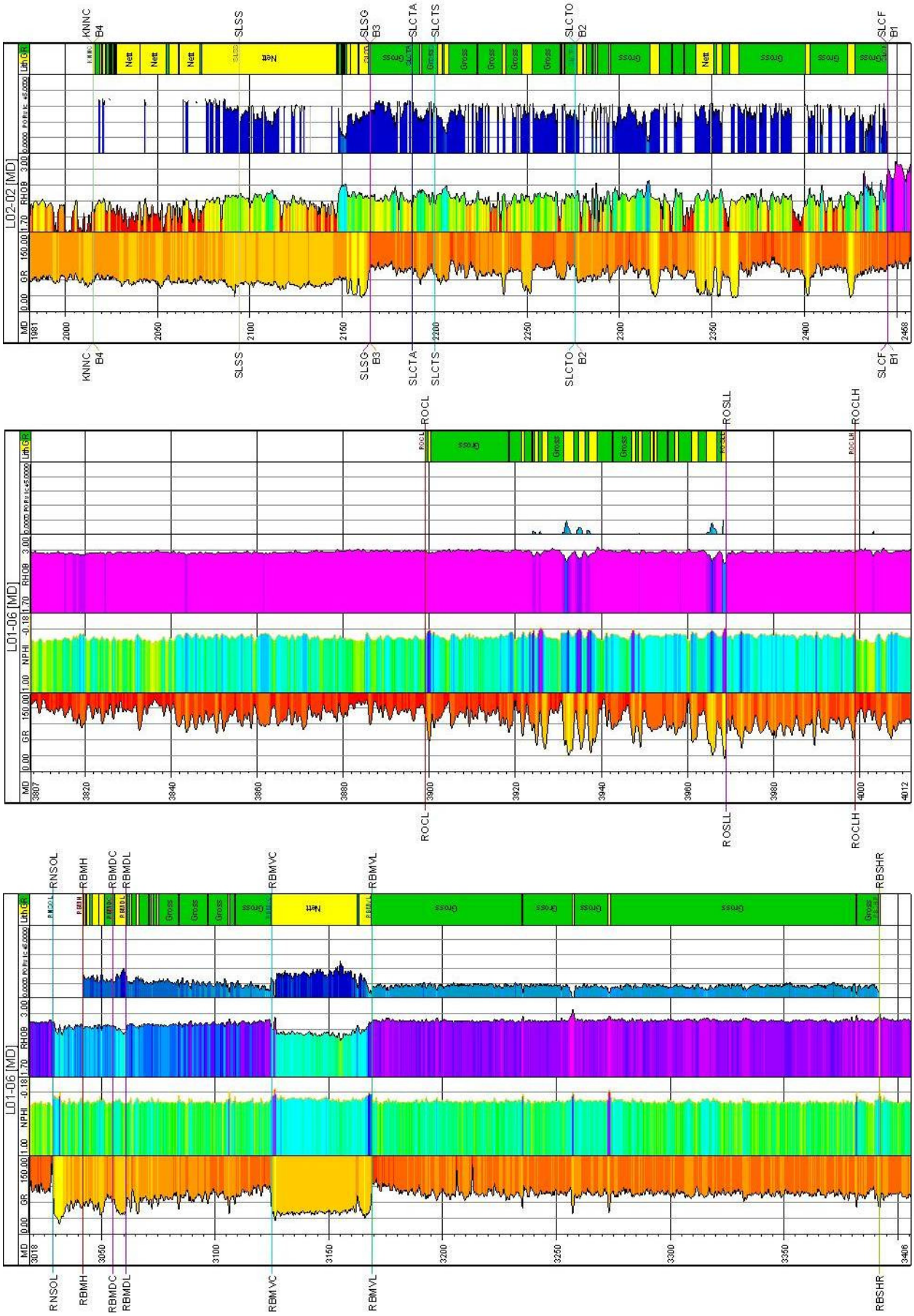
RBMVC
RBMVL
RBSHR
Nett
Gross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L01-06 [MD]
L01-06 [MD]
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B4
SLSS
SLSG
B3
SLCTA
SLCTS
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B2
SLCF
B1
ROCL
ROSLL
ROCLH
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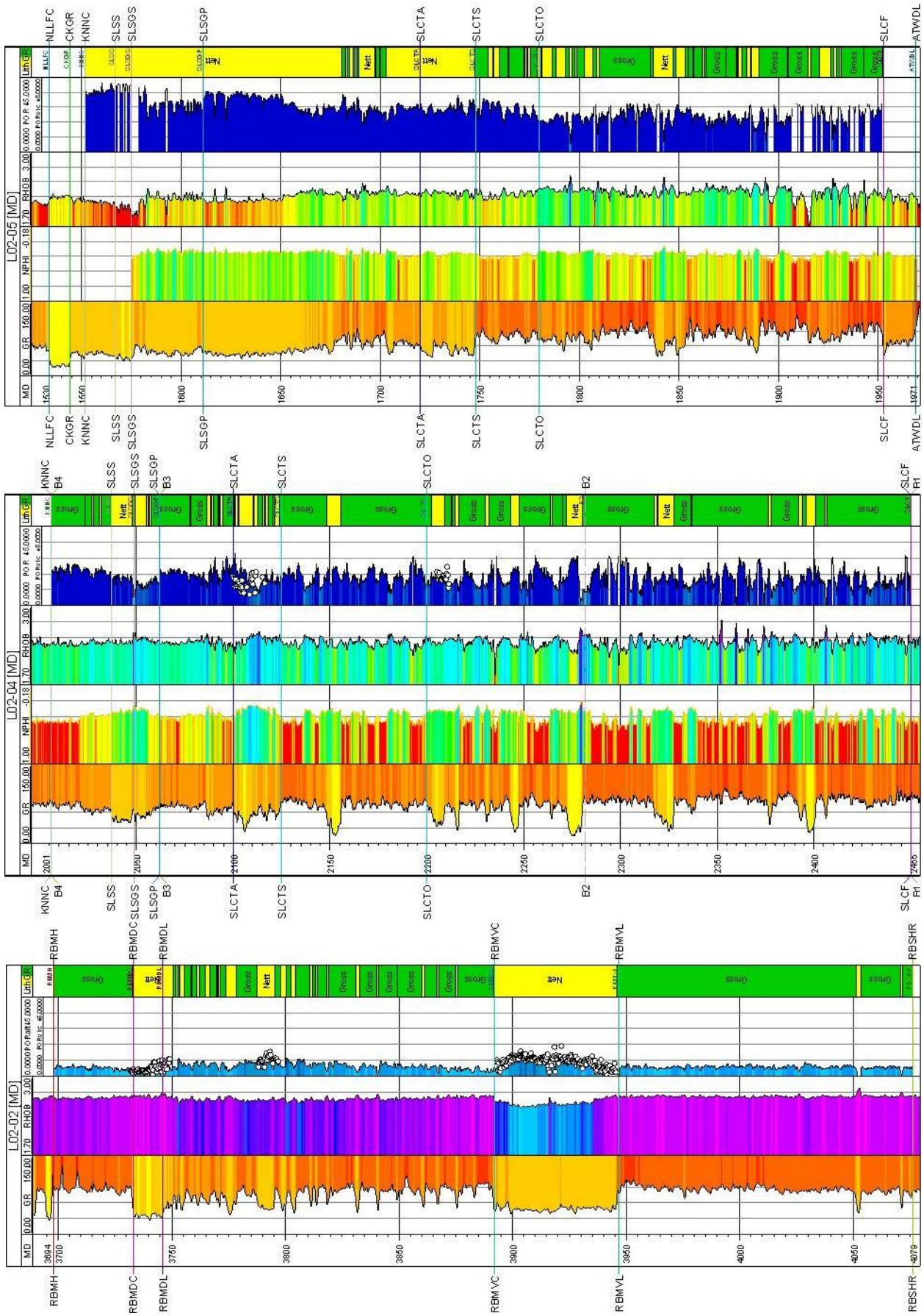
RBSHR
Nett
Gross
MD
GR
RHOB
NPHI
LithGR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L02-04 [MD]
L02-02 [MD]
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CKGR
KNNC
SLSS
SLSGS
SLSGP
SLCTA
SLCTS
SLCTO
SLCF
ATWDL
B4
B3
B2
R1
RBMH
RBMDC
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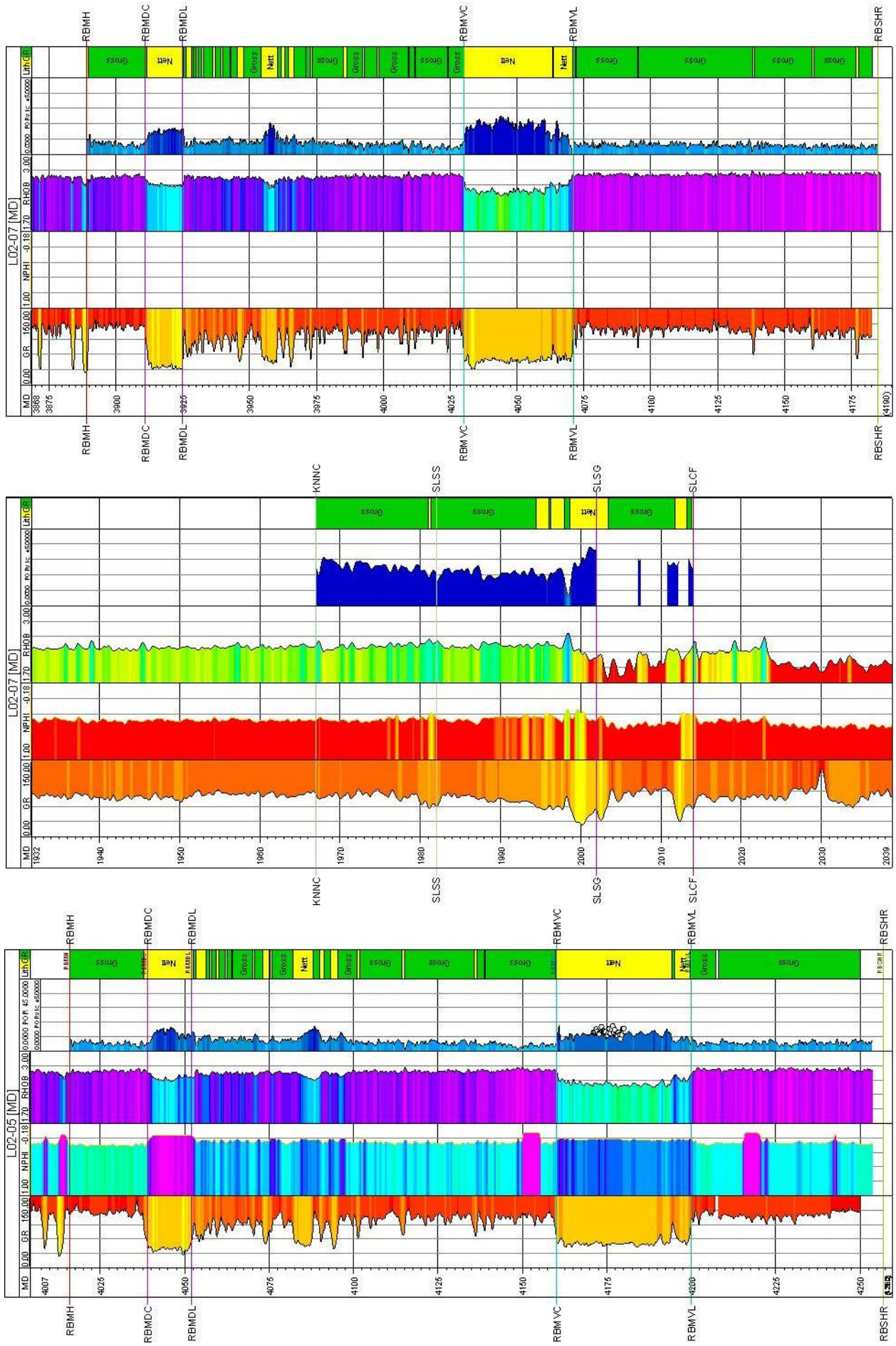
RBMVC
RBMVL
RBSHR
Gross
Nett


L02-07 [MD]
L02-05 [MD]
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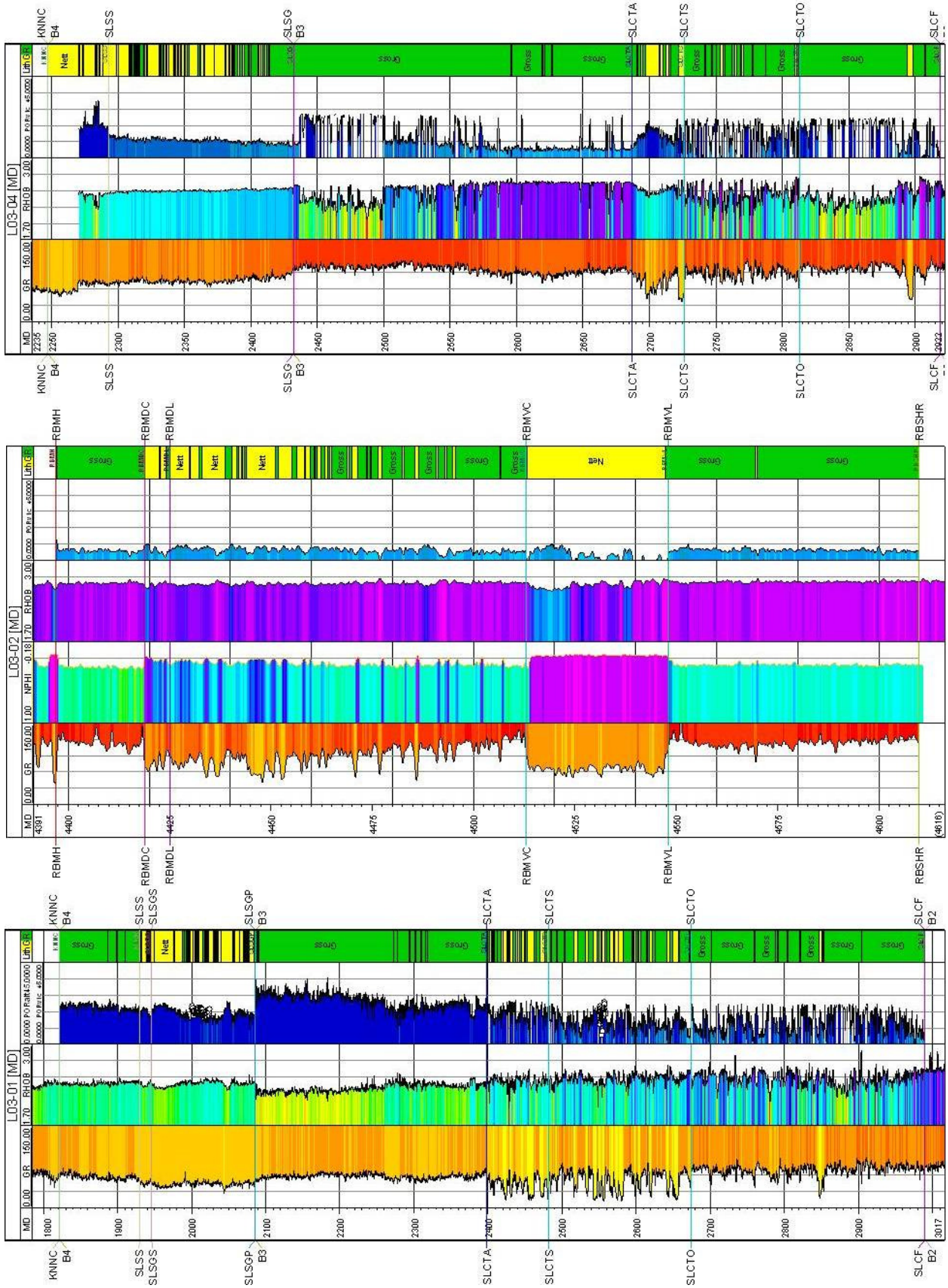
KNNC
SLSS
SLSG
SLCF
Gross
Nett
Net
GR
NPHI
RHOB
Lith GR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L03-02 [MD]
L03-01 [MD]
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SLSS
SLSG B3
SLCTA
SLCTS
SLCTO
SLCF B2
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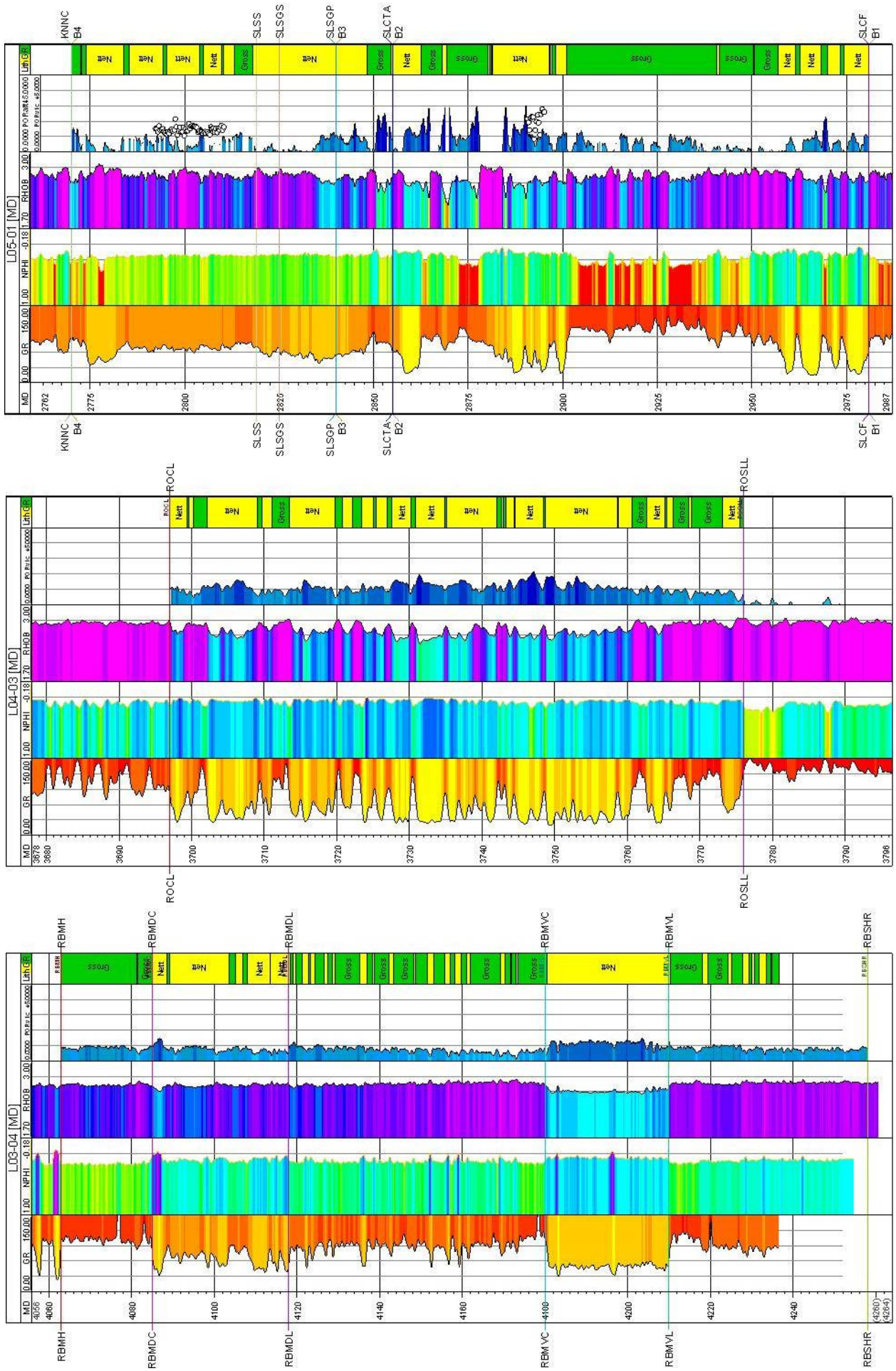
RBMDC
RBMDL
RBMVC
RBMYL
RBSHR
SLSGS
SLSGP B3
Gross
Nett
Net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L04-03 [MD]
L03-04 [MD]
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SLSGS
SLSGP B3
SLCTA B2
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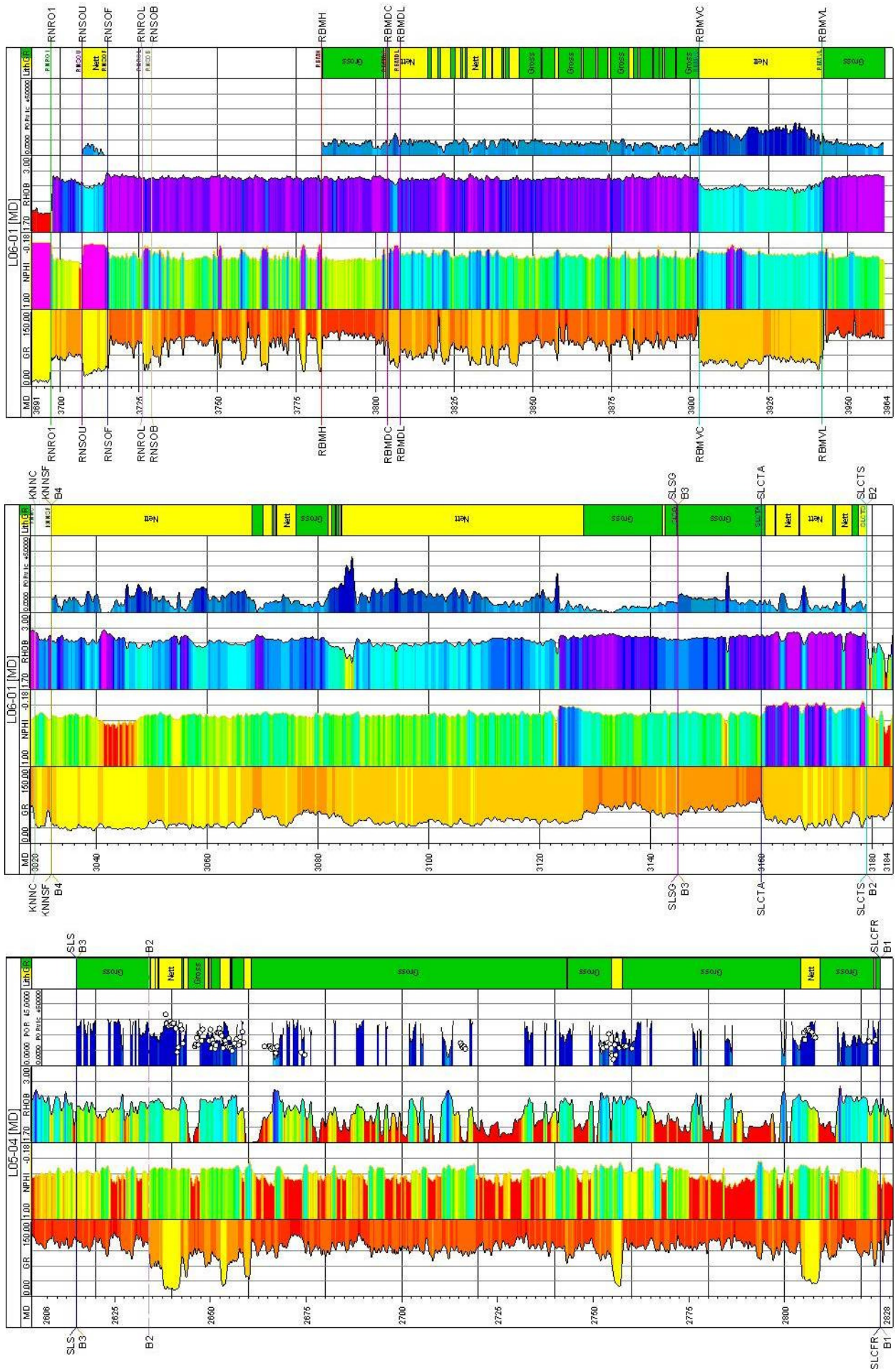
ROSLL
RBMH
RBMDC
RBMDL
RBMVC
RBMVL
RBSHR
Gross
Nett
Net
LithGR
RHOB
NPHI
GR
MD


L06-01 [MD]
L05-04 [MD]
MD
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NPHI
RHOB
Lith GR
Gross
Nett
RNRO1
RNSOU
RNSOF
RNROL
RNSOB
RBMH
RBMDC
RBMDL
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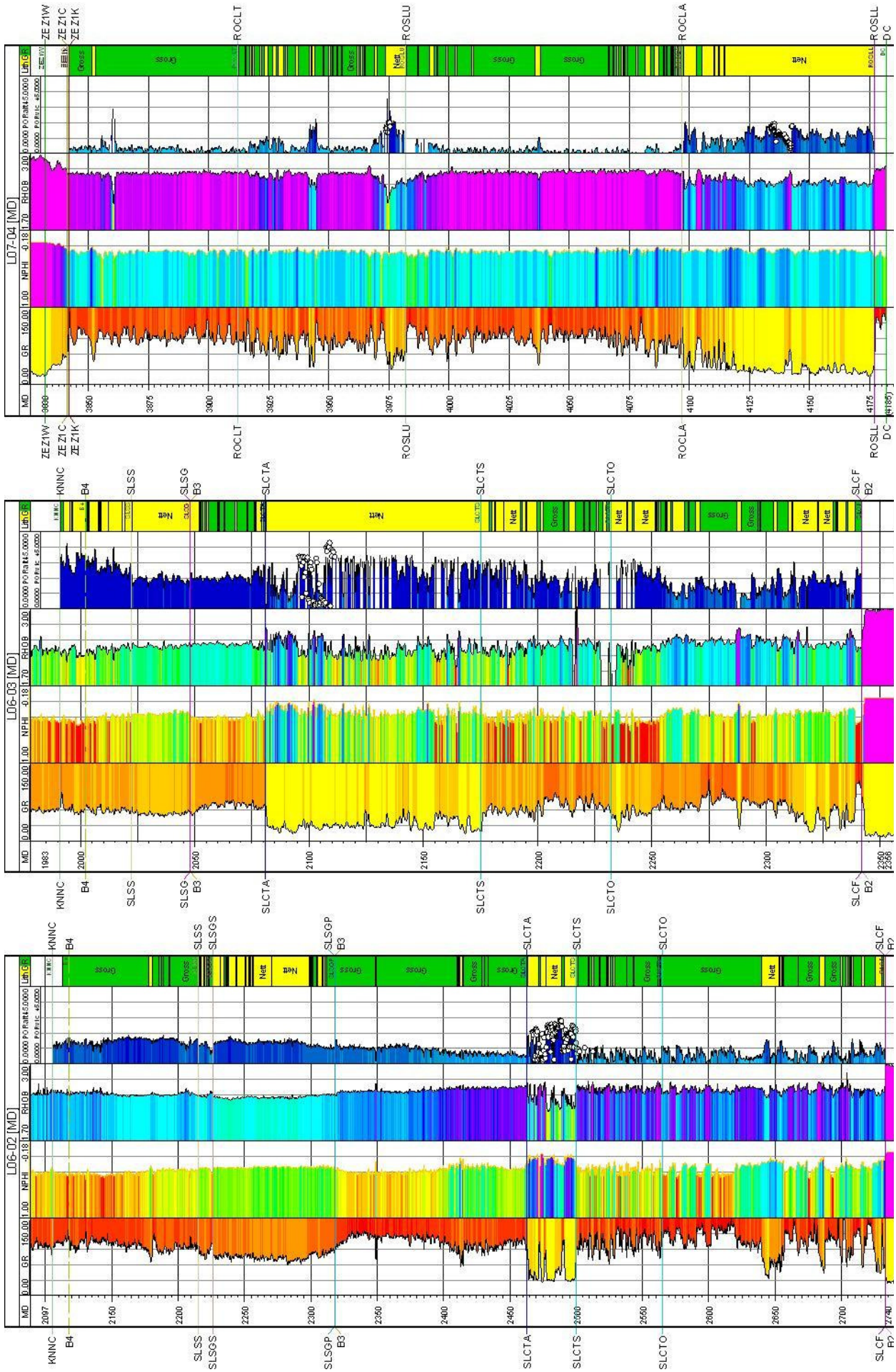
RBMVL
KNNC
KNNSF
B4
SLSG
B3
SLCTA
SLCTS
B2
SLS
SLCFR
B1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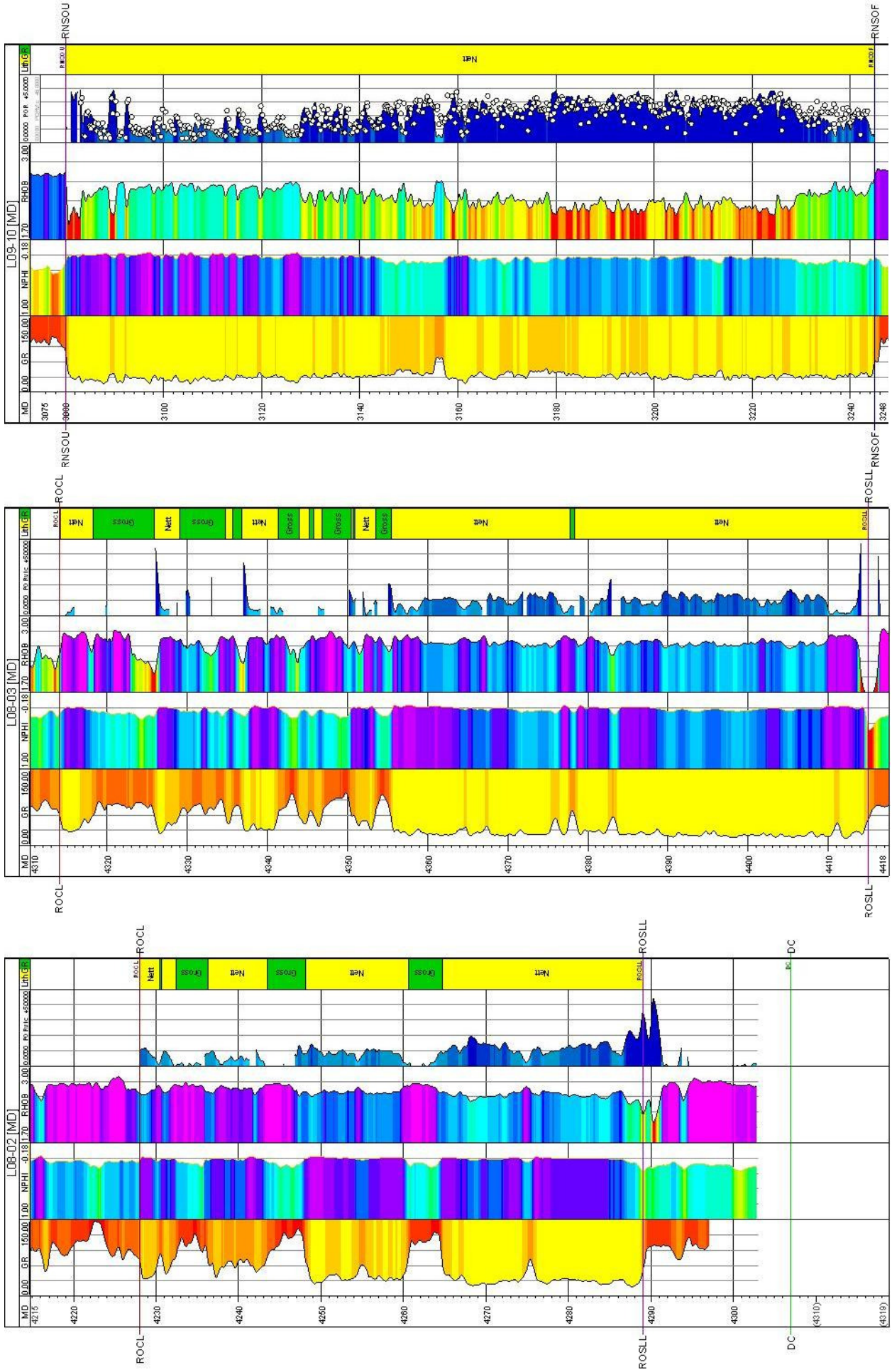
L06-03 [MD]
L06-02 [MD]
MD
GR
NPHI
RHOB
Lith GR
ZE Z1W
ZE Z1C
ZE Z1K
ROCLT
ROSLU
ROCLA
ROSLL
DC
KNNC
B4
SLSS
SLSG
B3
SLCTA
SLCTS
SLCTO
SLCF
B2
SLSGS
SLSGP
Gross
Nett


L09-10 [MD]
L08-03 [MD]
L08-02 [MD]
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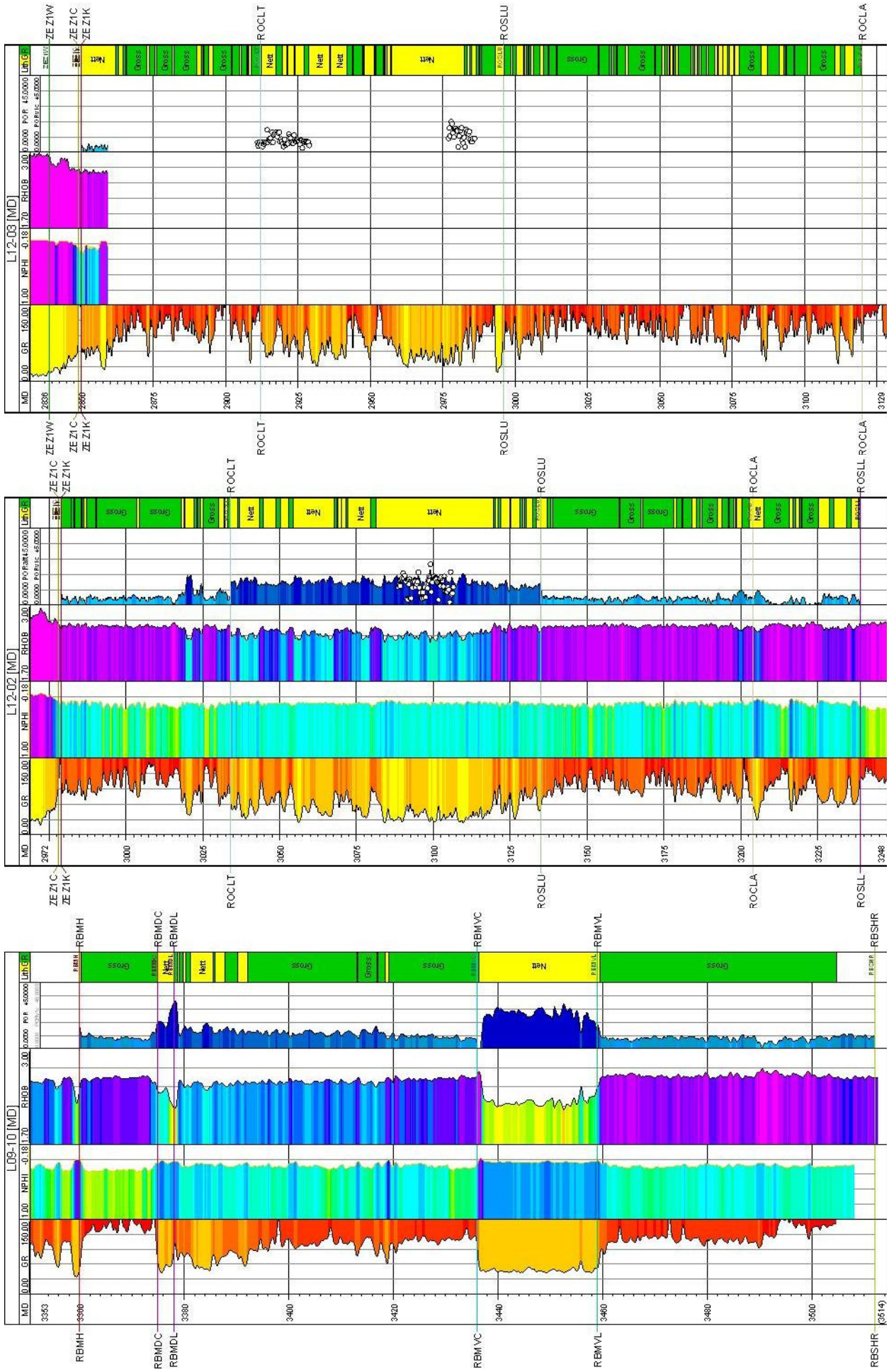
RNSOF
ROCL
ROSLL
DC
Net
Gross
Nett
Lith GR
RHOB
NPHI
GR
MD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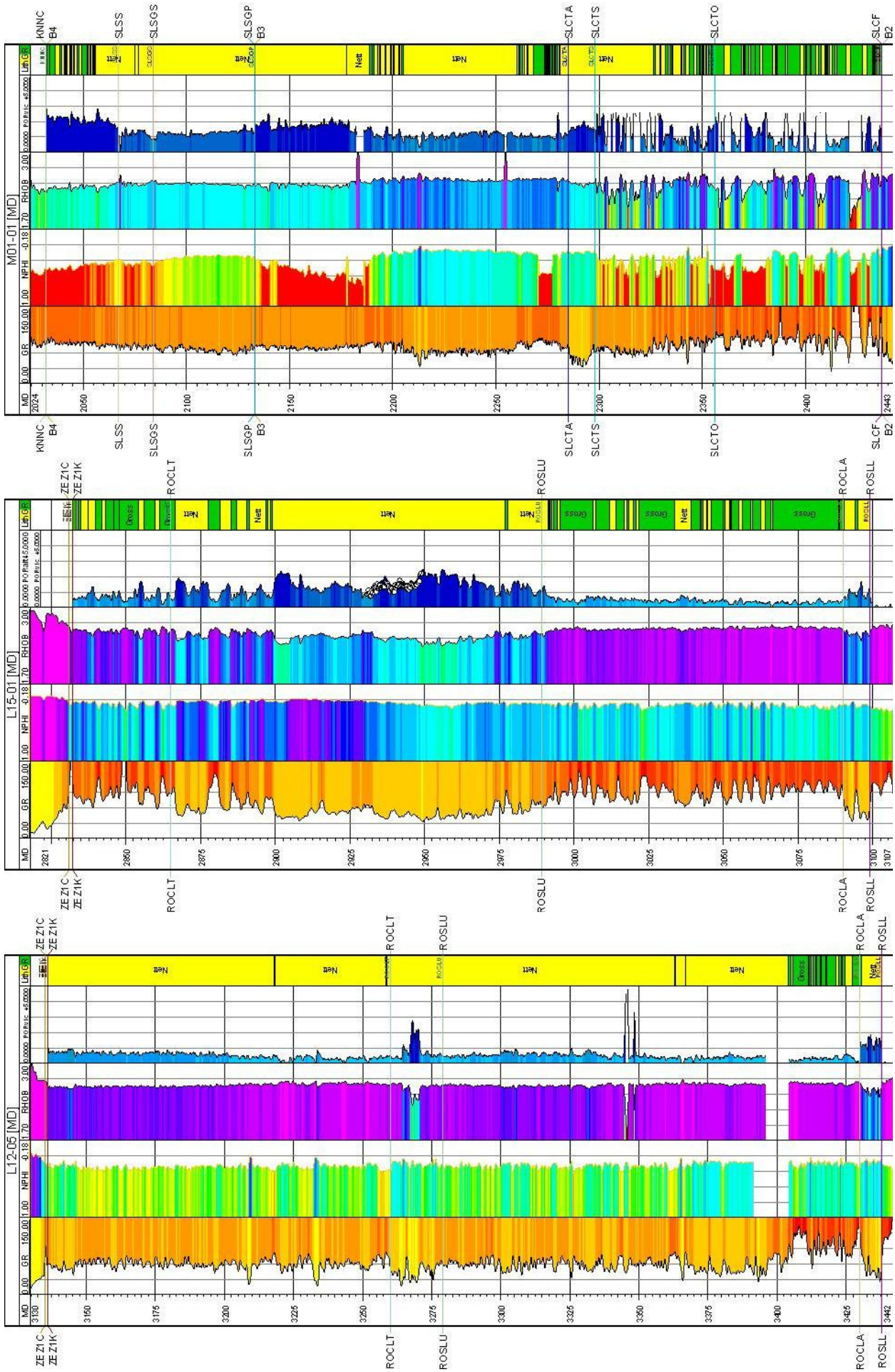
L12-02 [MD]
L09-10 [MD]
MD
GR
NPHI
RHOB
Lith GR
ZE Z1W
ZE Z1C
ZE Z1K
ROCLT
ROSLU
ROCLA
ROSLL
RBMH
RBMDC
RBMDL
RBMVC
RBMVL
RBSHR
Net
Nett
Gross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L15-01 [MD]
L12-05 [MD]
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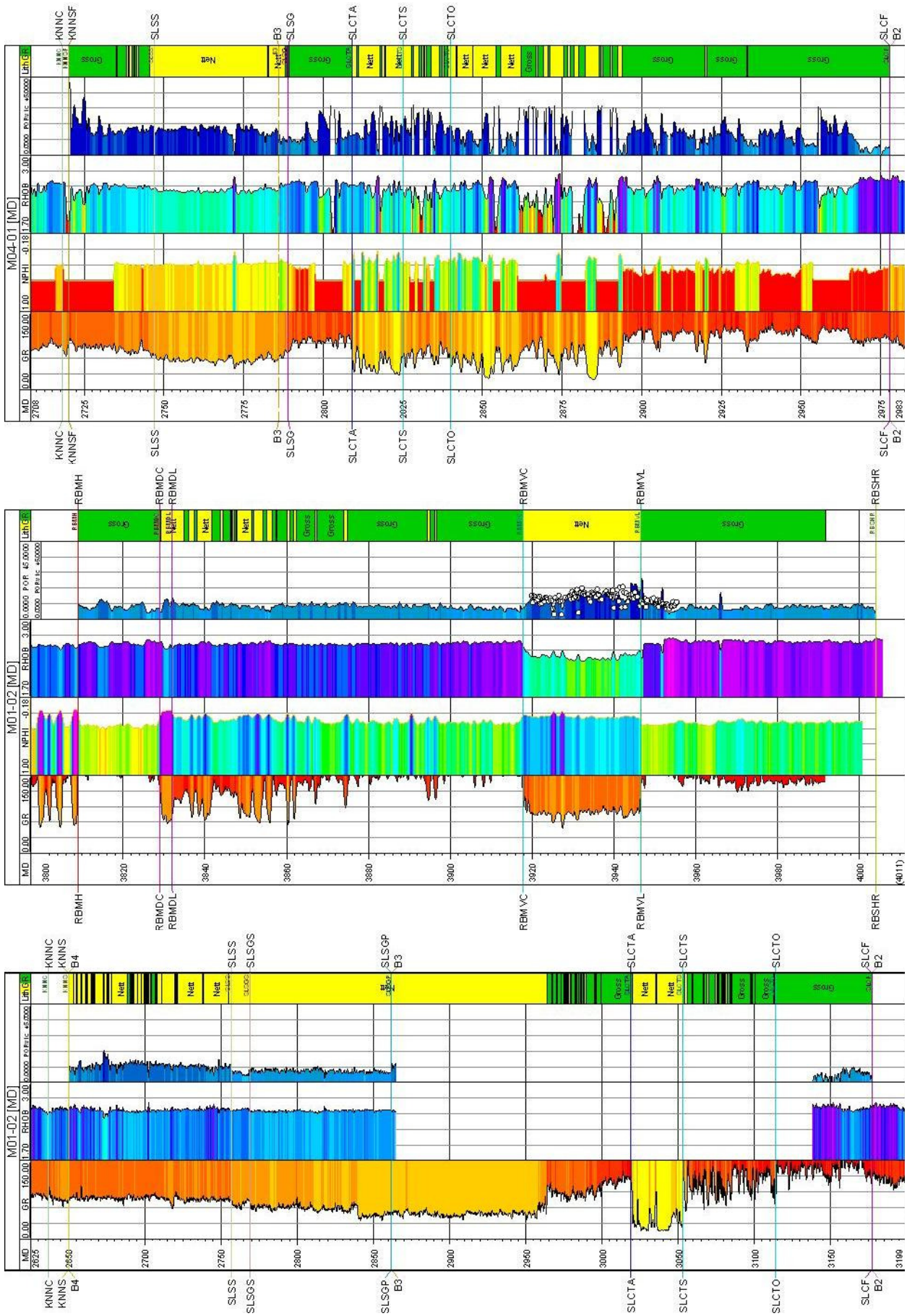
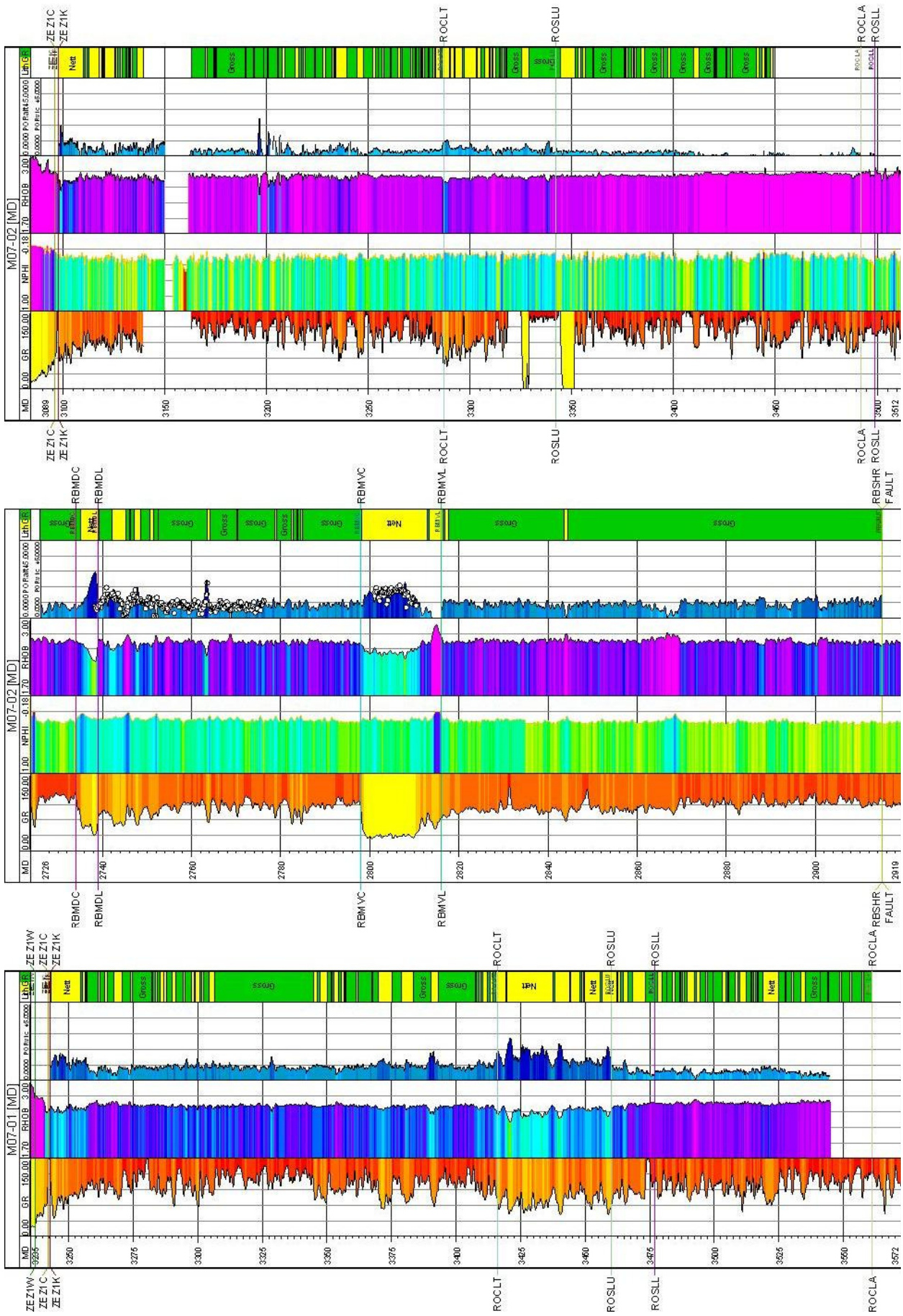
B4
SLSS
SLSGS
SLSGP
B3
SLCTA
SLCTS
SLCTO
SLCF
B2
ZE Z1C
ZE Z1K
ROCLT
ROSLU
ROCLA
ROSLL
MD
GR
NPHI
RHOB
Net
Gross
Nett


M04-01 [MD]
M01-02 [MD]
M01-02 [MD]
MD
GR
NPHI
RHOB
Lith GR
KNNC
KNNSF
SLSS
B3
SLSG
SLCTA
SLCTS
SLCTO
SLCF
B2
RBMH
RBMDC
RBMDL
RBMVC
RBMYL
RBSHR
KNNS
B4
SLSGS
SLSGP
Gross
Net
Nett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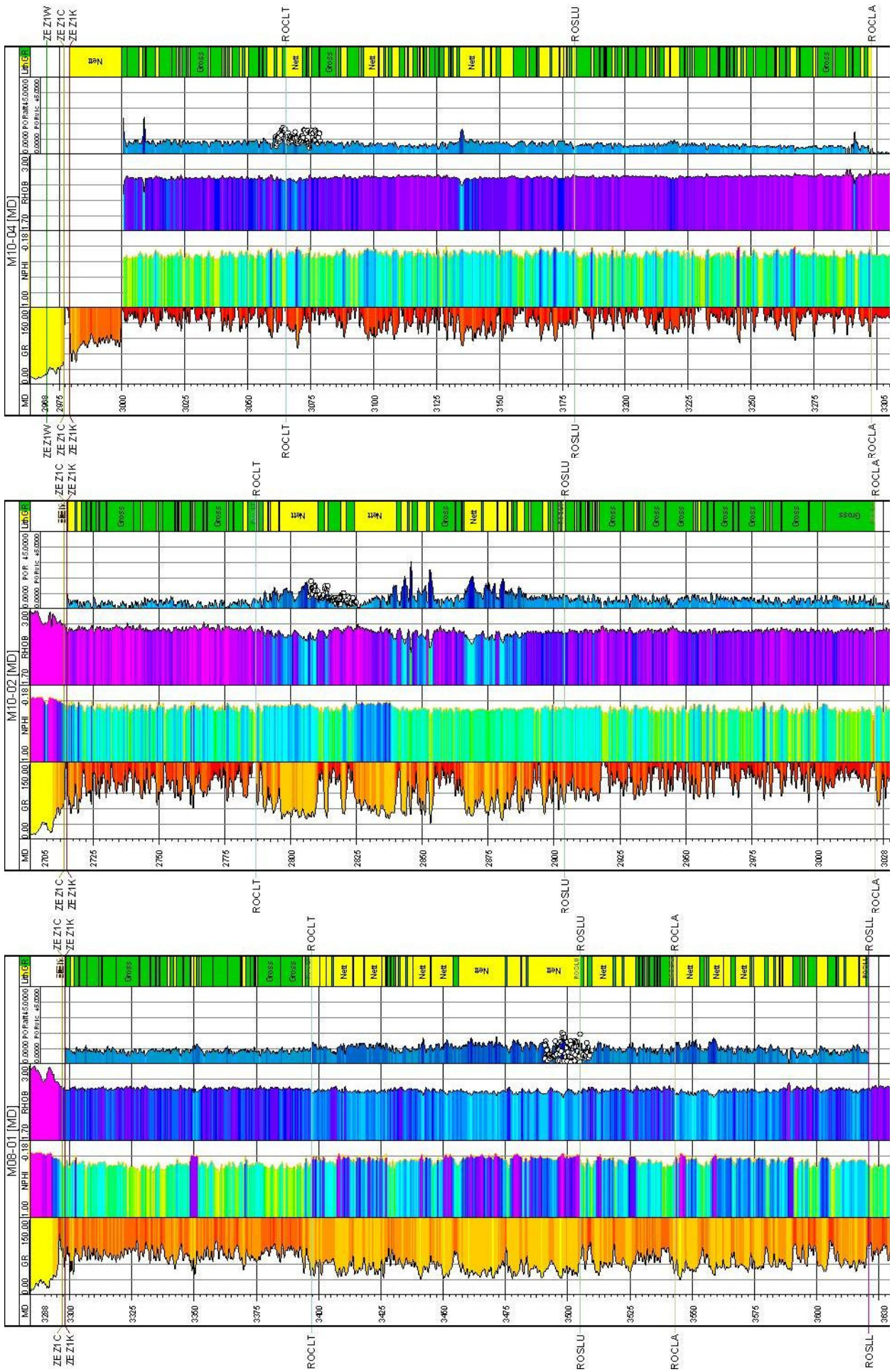
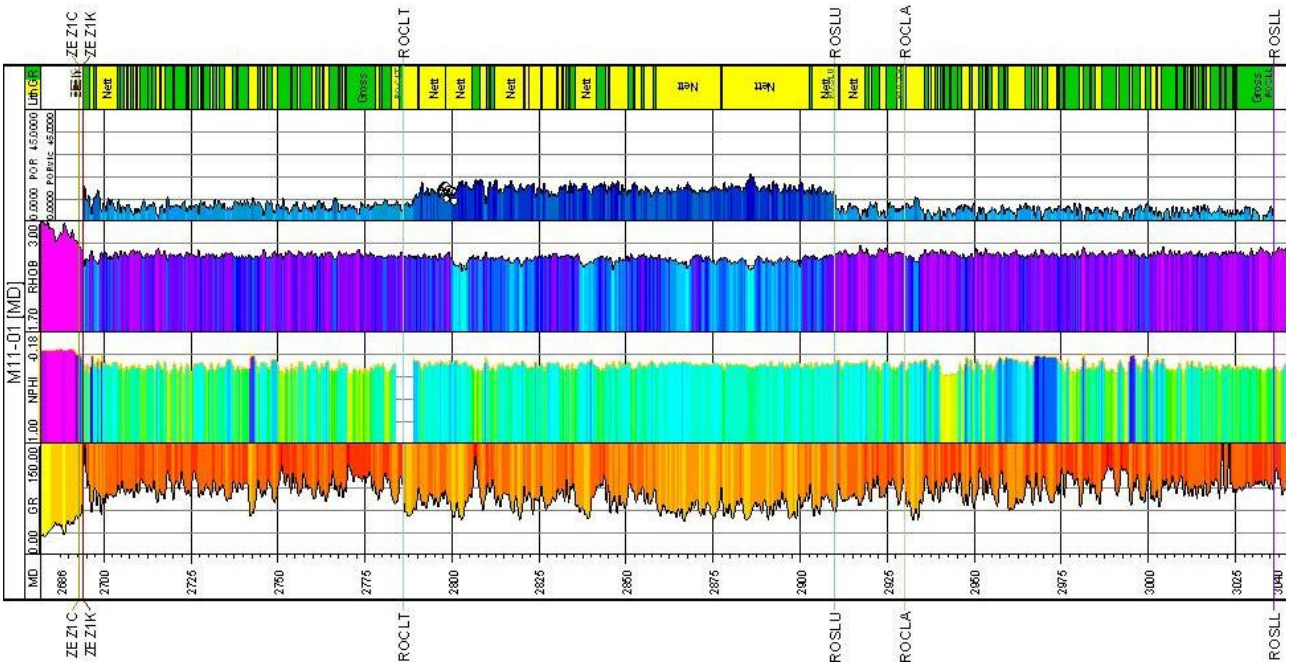
M07-01 [MD]
MD
GR
NPHI
RHOB
Lith GR
Net
Gross
ZE Z1C
ZE Z1K
ZE Z1W
ROCLT
ROSLU
ROSLL
ROCLA
RBMDC
RBMDL
RBMVC
RBMVL
RBSHR
FAULT


M10-04 [MD]
M10-02 [MD]
M08-01 [MD]
ZE Z1W
ZE Z1C
ZE Z1K
ROCLT
ROSLU
ROCLA
ROSLL
Net
Gross
Nett
LithGR
PORFalt
PORFric
RHOB
NPHI
GR
MD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MD
2686
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2725
2750
2775
2800
2825
2850
2875
2900
2925
2950
2975
3000
3025
3040
GR
0.00
150.00
NPHI
1.00
-0.18
RHOB
1.70
3.00
POR
0.0000
45.0000
UnGR
ZE Z1C
ZE Z1K
ROCLT
ROSLU
ROCLA
ROSLL
Nett
Gross

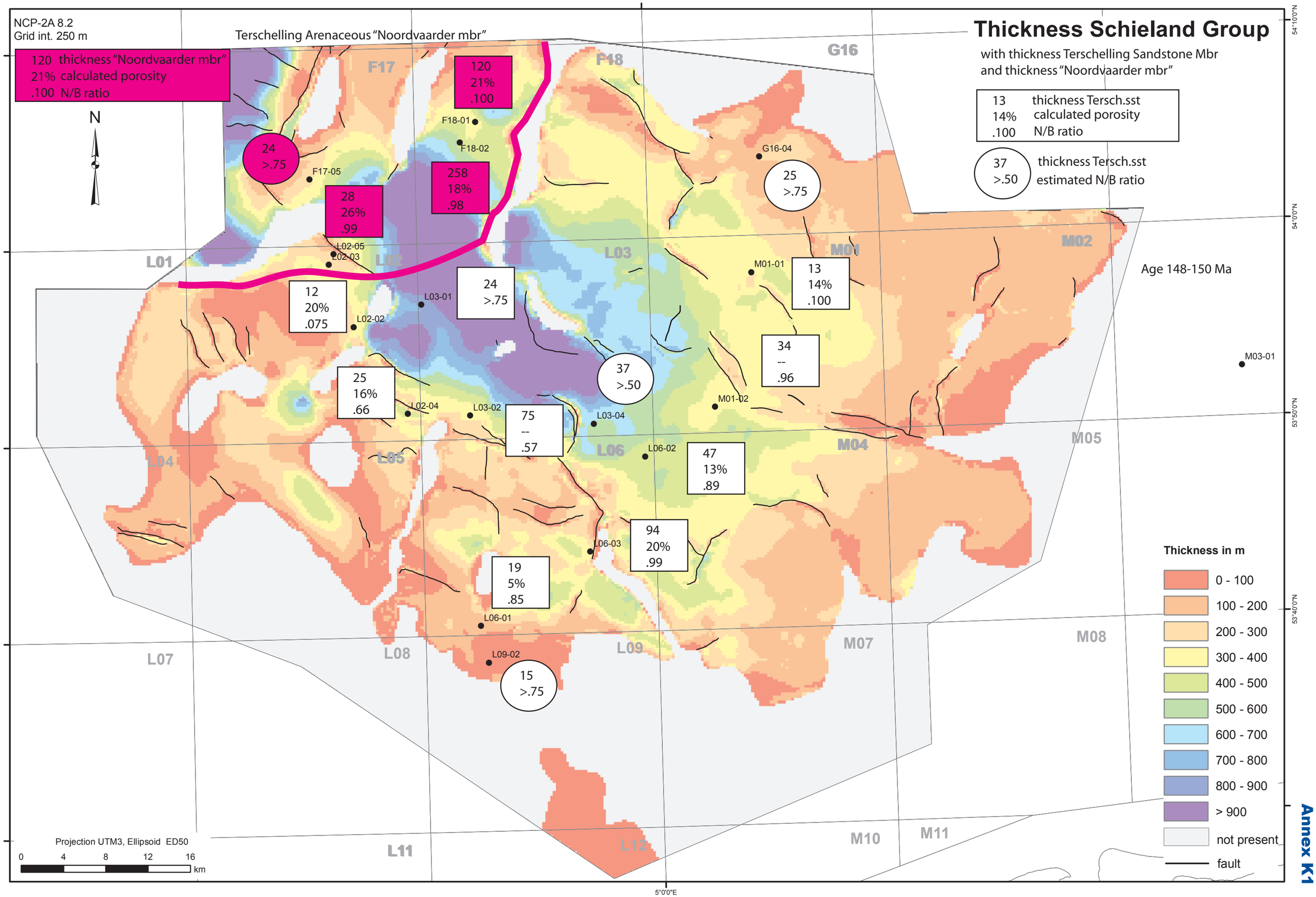
Litho-stratigraphic units		SLSS	SLSG	SLSGS	SLSGP	SLCT	SLCTA	SLCTB	SLCTS	SLCTO	SLCF	SLCFR	RNSOF	RBMDC	RBMDL	RBMVC	RBMVL	RBSHR	ROCLT	ROSLU	ROCLA	ROSLL
F15-02	porosity [%]	12.54 ± 1.20		14.29 ± 2.49	19.72 ± 2.89		10.98 ± 4.43		16.33 ± 3.54	2.61 ± 1.99	6.46 ± 2.94											
	top [m]	2927.0		3021.0	3041.0		3065.0		3246.0	3276.0	3335.0											
	base [m]	3021.0		3041.0	3065.0		3246.0		3276.0	3335.0	3417.0											
	N/G [-]	0.017		0.895	1.000		0.973		1.000	0.188	0.165											
F17-01	porosity [%]													6.59 ± 0.89	11.35 ± 1.91	7.85 ± 5.00	7.71 ± 3.06					
	top [m]		1660.0								1770.0	1815.0		3468.0	3498.0	3525.0	3602.0					
	base [m]		1770.0								1815.0	1870.0		3498.0	3525.0	3602.0	3610.0					
	N/G [-]		0.697								0.902	0.898		0.020	0.963	0.277	0.963					
F17-04	porosity [%]										18.67 ± 7.89	18.80 ± 8.18										
	top [m]										2411.0	2497.0										
	base [m]										2497.0	2572.0										
	N/G [-]										0.583	0.343										
F18-01	porosity [%]	21.57 ± 2.12		19.27 ± 1.53	26.11 ± 2.83	14.83 ± 2.16		21.04 ± 5.42			15.58 ± 3.30											
	top [m]	2148.0		2175.0	2193.0	2350.0		2230.0			2420.0											
	base [m]	2175.0		2193.0	2230.0	2420.0		2350.0			2686.0											
	N/G [-]	0.156		0.872	0.997	0.147		0.996			0.308											
F18-02	porosity [%]	24.14 ± 0.77		22.74 ± 2.30	27.95 ± 3.70	13.87 ± 3.45		18.05 ± 3.25			14.37 ± 4.08											
	top [m]	2042.0		2079.0	2105.0	2440.0		2182.0			2511.0											
	base [m]	2079.0		2105.0	2182.0	2511.0		2440.0			2734.0											
	N/G [-]	0.141		0.615	0.997	0.321		0.983			0.248											
F18-09	porosity [%]	18.34 ± 3.53		26.83 ± 4.00	30.08 ± 3.93		14.87 ± 3.58		14.91 ± 4.24	15.00 ± 5.13				6.95 ± 1.26	12.97 ± 1.25	8.79 ± 3.11	10.40 ± 3.07	4.13 ± 0.65				
	top [m]	2211.0		2282.0	2292.0		2335.0		2650.0	2707.0	2814.0			4387.0	4411.0	4425.0	4530.0	4565.0				
	base [m]	2282.0		2292.0	2335.0		2650.0		2707.0	2814.0	2885.0			4411.0	4425.0	4530.0	4565.0	4615.0				
	N/G [-]	0.859		1.000	1.000		0.076		0.026	0.093	0.000			0.488	0.936	0.300	0.989	0.019				
G16-01	porosity [%]		17.55 ± 11.97																			
	top [m]	2460.0	2470.0																			
	base [m]	2470.0	2478.0																			
	N/G [-]	0.000	0.850																			
G18-01	porosity [%]																					8.80 ± 1.67 [2]
	top [m]																					3822.0
	base [m]																					3829.0
	N/G [-]																					0.357
L01-06	porosity [%]												0.68 ± 1.27	12.13 ± 1.43	14.63 ± 2.13	9.47 ± 2.70	14.21 ± 3.50	2.51 ± 1.76				1.26 ± 2.16
	top [m]												3008.0	3042.0	3055.0	3061.0	3125.0	3169.0				3899.0
	base [m]												3015.0	3055.0	3061.0	3125.0	3169.0	3392.0				3969.0
	N/G [-]												0.629	0.523	0.817	0.109	0.968	0.015				0.280
L02-02	porosity [%]	27.58 ± 2.12	21.39 ± 3.83						19.74 ± 1.59	21.12 ± 4.29	22.44 ± 4.07			3.43 ± 0.35	1.98 ± 1.21	4.98 ± 1.86	5.53 ± 2.94	0.77 ± 0.98				
	top [m]	2015.0	2094.0				2165.0		2188.0	2200.0	2276.0			3698.0	3733.0	3746.0	3892.0	3947.0				
	base [m]	2094.0	2165.0				2188.0		2200.0	2276.0	2445.0			3733.0	3746.0	3892.0	3947.0	4076.0				
	N/G [-]	0.853	0.942				0.000		0.075	0.193	0.222			0.009	1.000	0.264	0.985	0.022				
L02-04	porosity [%]	18.02 ± 1.69		15.65 ± 1.58	11.57 ± 1.91		15.94 ± 3.19		15.91 ± 4.42	18.03 ± 3.43	16.70 ± 5.24											
	top [m]	2006.0		2037.0	2049.0		2062.0		2100.0	2125.0	2200.0											
	base [m]	2037.0		2049.0	2062.0		2100.0		2125.0	2200.0	2450.0											
	N/G [-]	0.071		0.892	0.638		0.124		0.664	0.100	0.176											
L02-05	porosity [%]	36.46 ± 1.75		37.87 ± 2.19	28.1 ± 3.96		28.55 ± 4.73		25.94 ± 2.71	25.61 ± 3.84	19.65 ± 4.31			4.32 ± 0.84	10.92 ± 2.57	7.64 ± 2.65	9.83 ± 1.79 [1]					
	top [m]	1552.0		1567.0	1575.0		1611.0		1720.0	1748.0	1780.0			4016.0	4039.0	4052.0	4161.0	4200.0				
	base [m]	1567.0		1575.0	1611.0		1720.0		1748.0	1780.0	1953.0			4039.0	4052.0	4161.0	4200.0	4257.0				
	N/G [-]	1.000		1.000	1.000		0.911		0.993	0.309	0.316			0.043	1.000	0.196	0.975	0.000				
L02-07	porosity [%]	16.81 ± 0.58	22.86 ± 6.01								23.51 ± 1.30			8.84 ± 0.92	13.41 ± 1.35	8.5 ± 3.6	15.77 ± 4.18	4.33 ± 1.06				
	top [m]	1967.0	1982.0								2002.0			3889.0	3911.0	3925.0	4030.0	4071.0				
	base [m]	1982.0	2002.0								2014.0			3911.0	3925.0	4030.0	4071.0	4185.0				
	N/G [-]	0.027	0.330								0.250			0.032	0.957	0.223	0.993	0.025				
L03-01	porosity [%]	21.58 ± 1.38		18.56 ± 1.76	17.35 ± 2.91		19.59 ± 4.90		16.58 ± 3.85	13.18 ± 4.37	9.66 ± 5.08											
	top [m]	1822.0		1930.0	1946.0		2086.0		2399.0	2482.0	2674.0											
	base [m]	1930.0		1946.0	2086.0		2399.0		2482.0	2674.0	2990.0											
	N/G [-]	0.009		0.688	0.813		0.012		0.567	0.361	0.035											

Litho-stratigraphic units		SLSS	SLSG	SLSGS	SLSGP	SLCT	SLCTA	SLCTB	SLCTS	SLCTO	SLCF	SLCFR	RNSOF	RBMDC	RBMDL	RBMVC	RBMVL	RBSHR	ROCLT	ROSLU	ROCLA	ROSLL
L03-02	porosity [%]													9.9 ± 0.91	5.59 ± 2.21	5.63 ± 1.63	3.01 ± 2.73	4.37 ± 1.08				
	top [m]	2470.0		2497.0	2507.0		2620.0		2785.0		2860.0			4397.0	4419.0	4425.0	4513.0	4548.0				
	base [m]	2497.0		2507.0	2620.0		2785.0		2860.0		2936.0			4419.0	4425.0	4513.0	4548.0	4610.0				
	N/G [-]	0.056		0.580	0.905		0.048		0.575		0.037			0.023	0.800	0.442	0.974	0.008				
L03-04	porosity [%]	19.17 ± 3.94	10.28 ± 1.09				3.49 ± 1.74		13.76 ± 4.05	4.97 ± 6.07	8.08 ± 4.58			5.17 ± 0.43	6.91 ± 1.92	5.81 ± 2.00	10.08 ± 1.70	7.00 ± 1.53				
	top [m]	2247.0	2293.0				2432.0		2687.0	2726.0	2813.0			4063.0	4085.0	4118.0	4180.0	4210.0				
	base [m]	2293.0	2432.0				2687.0		2726.0	2813.0	2919.0			4085.0	4118.0	4180.0	4210.0	4258.0				
	N/G [-]	0.965	0.594				0.007		0.544	0.116	0.051			0.009	0.906	0.263	0.980	0.251				
L04-03	porosity [%]																					10.49 ± 2.78 [1]
	top [m]															2647.0	2695.0	2721.0				3697.0
	base [m]															2695.0	2721.0	2830.0				3776.0
	N/G [-]																					0.749
L05-01	porosity [%]	3.98 ± 3.09		1.08 ± 1.37	3.28 ± 3.90		8.06 ± 2.54				6.95 ± 5.54											
	top [m]	2770.0		2819.0	2825.0		2840.0				2855.0											
	base [m]	2819.0		2825.0	2840.0		2855.0				2981.0											
	N/G [-]	0.745		1.000	1.000		0.573				0.388											
L05-04	porosity [%]											19.75 ± 4.53										
	top [m]											2615.0										
	base [m]											2825.0										
	N/G [-]											0.112										
L06-01	porosity [%]		8.89 ± 4.53						5.17 ± 4.16				7.04 ± 3.08	7.52 ± 0.28	9.21 ± 2.40	6.74 ± 1.88	13.65 ± 2.40	11.11 ± 2.40				
	top [m]		3032.0				3145.0		3160.0				3707.0	3783.0	3804.0	3808.0	3903.0	3942.0				
	base [m]		3145.0				3160.0		3179.0				3715.0	3804.0	3808.0	3903.0	3942.0	4044.0				
	N/G [-]		0.767				0.000		0.853				1.000	0.029	0.900	0.383	1.000	0.020				
L06-02	porosity [%]	13.82 ± 1.09		11.8 ± 0.93	12.57 ± 1.28		4.92 ± 1.76		13.25 ± 5.39 [1,2]	1.14 ± 1.31 [2]	6.89 ± 4.36											
	top [m]	2105.0		2215.0	2226.0		2318.0		2463.0	2500.0	2565.0											
	base [m]	2215.0		2226.0	2318.0		2463.0		2500.0	2565.0	2733.0											
	N/G [-]	0.033		0.445	0.817		0.030		0.897	0.120	0.197											
L06-03	porosity [%]	25.81 ± 4.36	17.19 ± 2.00 [2]				18.44 ± 2.26		20.10 ± 7.44 [2]	18.66 ± 6.13	15.04 ± 6.17 [2]											
	top [m]	1991.0	2022.0				2048.0		2081.0	2175.0	2232.0											
	base [m]	2022.0	2048.0				2081.0		2175.0	2232.0	2342.0											
	N/G [-]	0.848	0.988				0.321		0.999	0.525	0.535											
L07-04	porosity [%]																		3.07 ± 1.16	8.39 ± 6.13	2.82 ± 2.24	9.75 ± 3.49
	top [m]												3183.0	3227.0	3244.0	3248.0	3332.0	3384.0	3842.0	3912.0	3982.0	4097.0
	base [m]												3186.0	3244.0	3248.0	3332.0	3384.0	3555.0	3912.0	3982.0	4097.0	4177.0
	N/G [-]																		0.023	0.380	0.155	0.958
L08-02	porosity [%]																					8.89 ± 4.08
	top [m]																	3366.0				4228.0
	base [m]																	3435.0				4289.0
	N/G [-]																					0.789
L08-03	porosity [%]																					8.47 ± 4.71
	top [m]													3390.0	3408.0	3414.0	3500.0	3548.0				4314.0
	base [m]													3408.0	3414.0	3500.0	3548.0	3658.0				4415.0
	N/G [-]																					0.757
L09-10	porosity [%]												22.25 ± 7.70 [2]	14.42 ± 3.06	19.84 ± 4.88	12.31 ± 2.85	22.9 ± 5.06	14.01 ± 2.35				
	top [m]												3080.0	3360.0	3375.0	3378.0	3436.0	3459.0				
	base [m]												3245.0	3375.0	3378.0	3436.0	3459.0	3512.0				
	N/G [-]												0.999	0.027	1.000	0.172	0.987	0.011				
L12-02	porosity [%]																		8.38 ± 4.65	13.53 ± 2.07 [1]	5.13 ± 1.76	4.51 ± 1.78
	top [m]																		2979.0	3034.0	3135.0	3204.0
	base [m]																		3034.0	3135.0	3204.0	3239.0
	N/G [-]																		0.184	0.872	0.171	0.471
L12-03	porosity [%]																		2.68 ± 1.23			
	top [m]																		2850.0	2912.0	2996.0	
	base [m]																		2912.0	2996.0	3120.0	
	N/G [-]																		0.348	0.749	0.263	

Litho-stratigraphic units		SLSS	SLSG	SLSGS	SLSGP	SLCT	SLCTA	SLCTB	SLCTS	SLCTO	SLCF	SLCFR	RNSOF	RBMDC	RBMDL	RBMVC	RBMVL	RBSHR	ROCLT	ROSLU	ROCLA	ROSLL
L12-05	porosity [%]																		4.60 ± 1.74	7.47 ± 5.56	4.58 ± 2.83	11.66 ± 2.42 [1]
	top [m]																		3136.0	3260.0	3279.0	3430.0
	base [m]																		3260.0	3279.0	3430.0	3438.0
	N/G [-]																		0.995	1.000	0.872	0.925
L15-01	porosity [%]																		8.73 ± 2.98	13.08 ± 3.83 [1]	4.78 ± 2.04	8.34 ± 2.55
	top [m]																		2832.0	2865.0	2989.0	3090.0
	base [m]																		2865.0	2989.0	3090.0	3099.0
	N/G [-]																		0.306	0.918	0.253	0.878
M01-01	porosity [%]	18.90 ± 2.41		10.60 ± 2.50	11.36 ± 1.30		12.24 ± 3.50		14.47 ± 1.52	10.85 ± 6.43	7.87 ± 6.43											
	top [m]	2032.0		2067.0	2084.0		2133.0		2285.0	2298.0	2356.0											
	base [m]	2067.0		2084.0	2133.0		2285.0		2298.0	2356.0	2437.0											
	N/G [-]	0.674		0.976	1.000		0.895		1.000	0.753	0.306											
M01-02	porosity [%]	9.69 ± 1.85		5.40 ± 1.12	6.55 ± 0.95		9.50 ± 1.09								8.99 ± 2.47	7.59 ± 1.43	12.32 ± 2.47 [1]	18.49 ± 2.28				
	top [m]	2650.0		2757.0	2769.0		2862.0		3019.0	3053.0	3114.0			3809.0	3829.0	3832.0	3917.0	3944.0				
	base [m]	2757.0		2769.0	2862.0		3019.0		3053.0	3114.0	3177.0			3829.0	3832.0	3917.0	3944.0	4004.0				
	N/G [-]	0.869		1.000	1.000		0.704		0.965	0.151	0.003			0.000	0.933	0.246	1.000	0.000				
M04-01	porosity [%]	15.53 ± 1.27	13.99 ± 2.78				7.33**		14.56 ± 5.40	15.61 ± 5.20	11.05 ± 6.84											
	top [m]	2720.0	2747.0				2789.0		2809.0	2825.0	2840.0											
	base [m]	2747.0	2789.0				2809.0		2825.0	2840.0	2978.0											
	N/G [-]	0.163	0.974				0.005		0.913	0.633	0.270											
M07-01	porosity [%]																		9.21 ± 2.53	13.93 ± 3.68	5.31 ± 1.45	6.78 ± 2.05
	top [m]																		3243.0	3416.0	3477.0	3460.0
	base [m]																		3416.0	3460.0	3561.0	3477.0
	N/G [-]																		0.325	0.911	0.320	0.612
M07-02	porosity [%]														16.74 ± 6.60	10.20 ± 3.88	10.74 ± 5.72 [2]	5.60 ± 3.82	3.67 ± 2.86	4.73 ± 1.91	1.64 ± 0.99	
	top [m]													2726.0	2734.0	2739.0	2798.0	2816.0	3098.0	3287.0	3342.0	3492.0
	base [m]													2734.0	2739.0	2798.0	2816.0	2915.0	3287.0	3342.0	3492.0	3499.0
	N/G [-]													0.000	0.780	0.137	0.967	0.020	0.374	0.485	0.253	
M08-01	porosity [%]																		8.24 ± 0.99	10.42 ± 1.93	9.07 ± 1.54	8.83 ± 2.30
	top [m]																		3298.0	3397.0	3505.0	3543.0
	base [m]																		3397.0	3505.0	3543.0	3621.0
	N/G [-]																		0.156	0.902	0.553	0.712
M10-02	porosity [%]																		2.73 ± 1.54	9.14 ± 4.36	5.28 ± 1.89	
	top [m]																		2715.0	2787.0	2904.0	
	base [m]																		2787.0	2904.0	3022.0	
	N/G [-]																		0.185	0.629	0.104	
M10-04	porosity [%]																		5.99 ± 1.21	6.27 ± 1.81	4.9 ± 1.42	
	top [m]																		2979.0	3065.0	3180.0	
	base [m]																		3065.0	3180.0	3298.0	
	N/G [-]																		0.450	0.578	0.293	
M11-01	porosity [%]																		5.97 ± 1.80	13.02 ± 1.69 [1]	4.53 ± 1.79	4.61 ± 1.68
	top [m]																		2694.0	2789.0	2910.0	2930.0
	base [m]																		2789.0	2910.0	2930.0	3036.0
	N/G [-]																		0.374	0.874	0.605	0.383

[1] *gas correction applied*

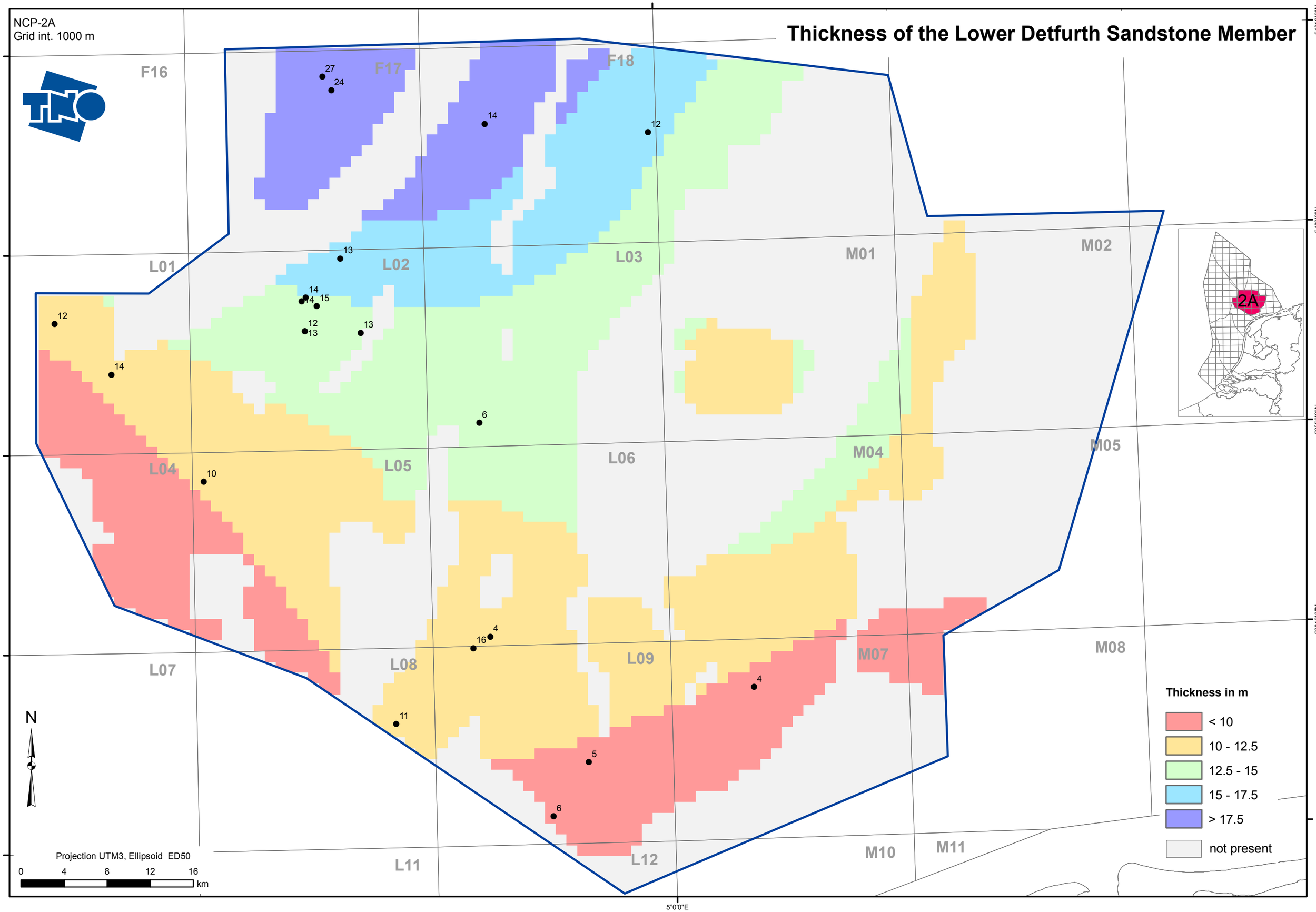
[2] *drilling core sample investigated*


Thickness Schieland Group
with thickness Terschelling Sandstone Mbr
and thickness "Noordvaarder mbr"
13 thickness Tersch.sst
14% calculated porosity
.100 N/B ratio
37 >.50 thickness Tersch.sst estimated N/B ratio
Age 148-150 Ma
NCP-2A 8.2
Grid int. 250 m
Terschelling Arenaceous "Noordvaarder mbr"
120 thickness "Noordvaarder mbr"
21% calculated porosity
.100 N/B ratio
N
120 21% .100
24 >.75
28 26% .99
258 18% .98
12 20% .075
24 >.75
25 16% .66
75 -- .57
37 >.50
13 14% .100
34 -- .96
25 >.75
47 13% .89
94 20% .99
19 5% .85
15 >.75
F17
F18
G16
L01
L02
L03
L04
L05
L06
L07
L08
L09
L11
L12
M01
M02
M04
M05
M07
M08
M10
M11
F18-01
F18-02
F17-05
G16-04
L02-05
L02-03
L03-01
L02-02
M01-01
M03-01
L02-04
L03-02
L03-04
M01-02
L06-02
L06-03
L06-01
L09-02
Thickness in m
0 - 100
100 - 200
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
> 900
not present
fault
Projection UTM3, Ellipsoid ED50
0 4 8 12 16 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E

Annex K1

NCP-2A
Grid int. 1000 m

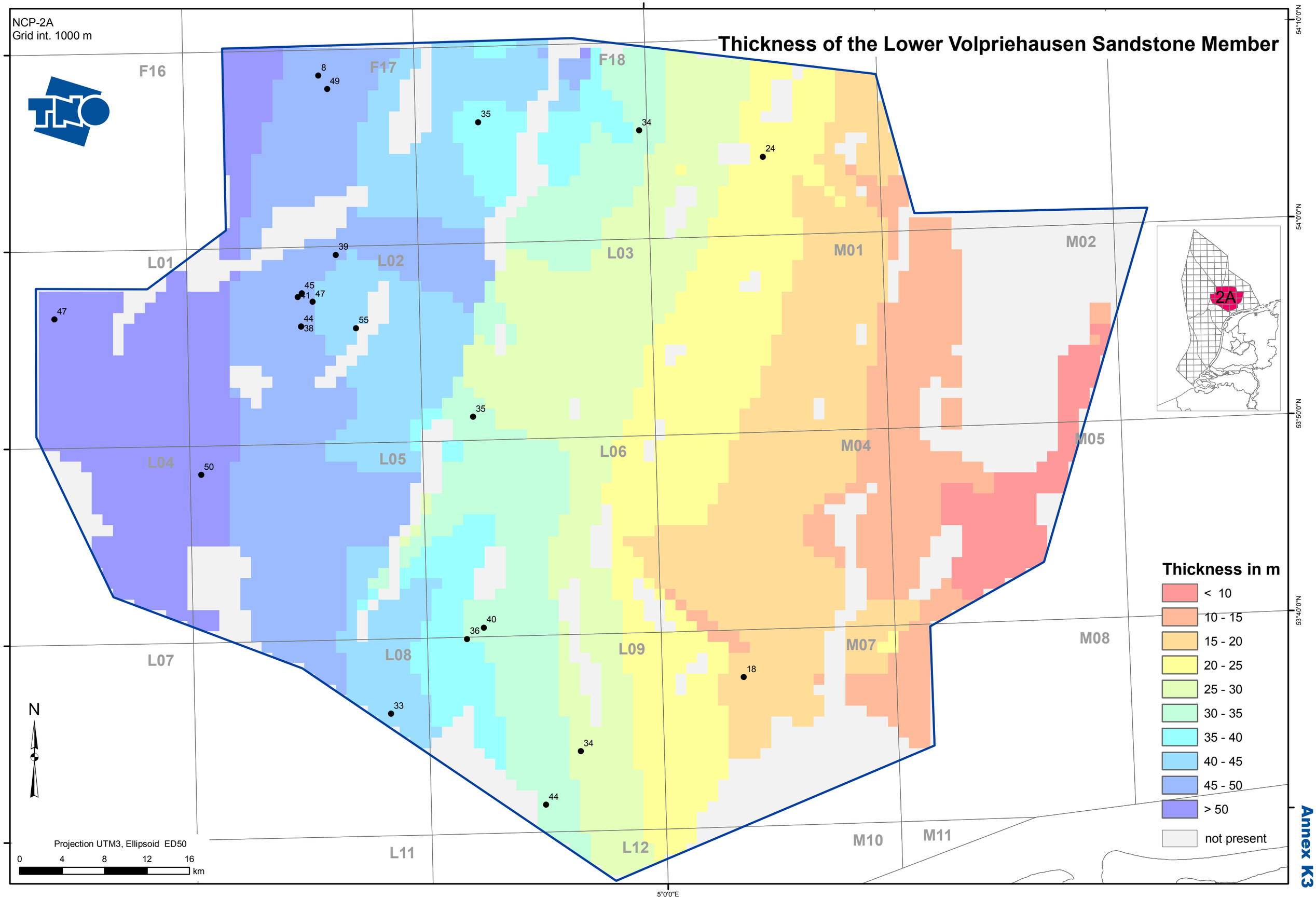
Thickness of the Lower Detfurth Sandstone Member



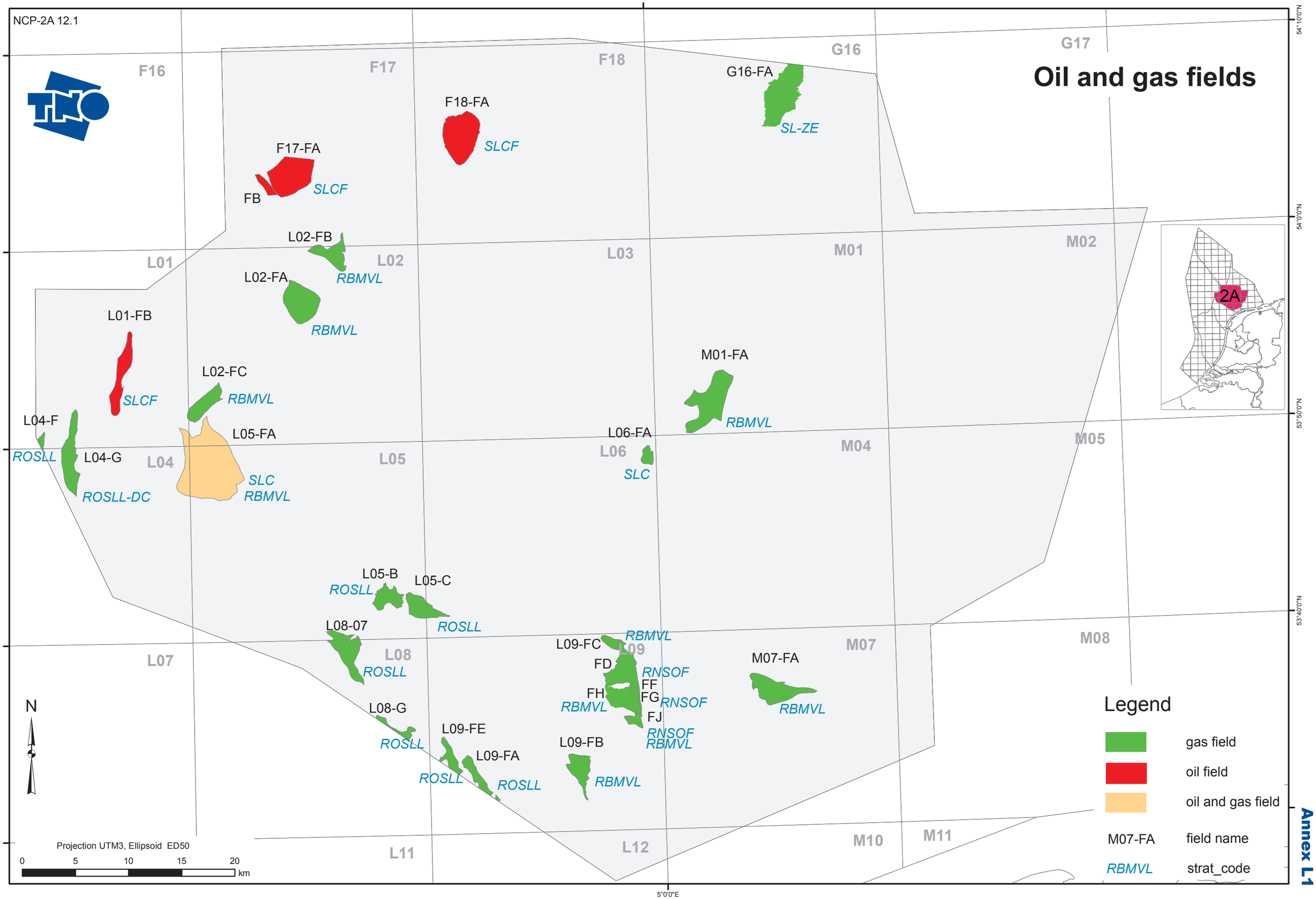
Annex K2

NCP-2A
Grid int. 1000 m

Thickness of the Lower Volpriehausen Sandstone Member



Annex K3


NCP-2A 12.1
Oil and gas fields
F16
F17
F18
G16
G17
F18-FA
SLCF
G16-FA
SL-ZE
F17-FA
SLCF
FB
L02-FB
RBMVL
L01
L02
L03
M01
M02
L02-FA
RBMVL
L01-FB
SLCF
L02-FC
RBMVL
M01-FA
RBMVL
L04-F
ROSLL
L04-G
ROSLL-DC
L04
L05-FA
SLC
RBMVL
L05
L06-FA
L06
SLC
M04
M05
L05-B
ROSLL
L05-C
ROSLL
L08-07
ROSLL
L08
L07
L09-FC
RBMVL
L09
FD
RNSOF
FF
FH
FG
RNSOF
RBMVL
FJ
RNSOF
RBMVL
M07
M07-FA
RBMVL
M08
L08-G
ROSLL
L09-FE
ROSLL
L09-FA
ROSLL
L09-FB
RBMVL
L11
L12
M10
M11
N
Projection UTM3, Ellipsoid ED50
0 5 10 15 20 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
5°0'0"E
2A
Legend
gas field
oil field
oil and gas field
M07-FA field name
RBMVL strat_code

Annex L1

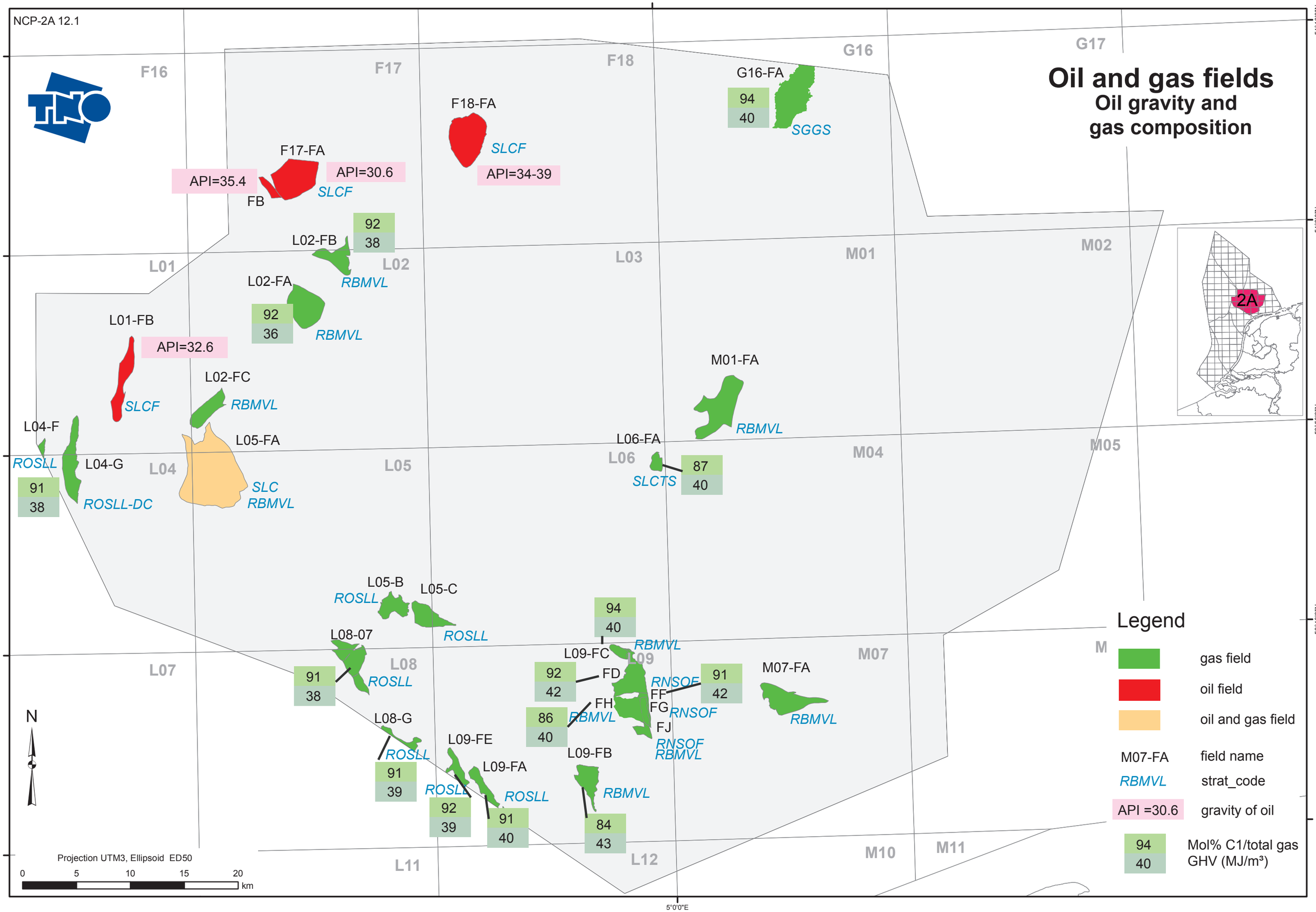
NCP-2a

NCP-2A: Terschelling Bekken

Field name	Type	Discovery	Structural element [1]	Well name	Lithostratigraphy	Structural style	Closure	Faults	Seal
TNO	*O/G*	*year*		*TNO*	*'richem Boogaert & Kouwe 1993-1997*				
F17-FA	Oil	1982	DCG	F17-03	SLCF	Anticlinal dome	4-way dip	minor	Lower Cretaceous clay
F17-FB	Oil	1982	DCG	F17-04	SLCF	Anticlinal E-W trend	4-way dip	none	Lower Cretaceous clay
F18-FA	Oil	1970	DCG	F18-01	SLCF	Turtle back	4-way dip	internal extensional faults	Lower Cretaceous clay
G16-FA	Gas	1990	TB/SGH	G16-03	SL-ZE	Top of salt dome	4-way dip	none	Lower Cretaceous clay
L01-FB	Oil	1985	DCG	L01-03	SLCF	E flank of salt structure	stratigraphic or base Lower Cretaceous unconformity	none	Lower Cretaceous clay or stratigraphic trap
L02-FA	Gas	1968	DCG	L02-01, L02-07	RBMV	Turtle back	3-way dip, to NW and SE salt walls	minor	Triassic clay and salt
L02-FB	Gas	1976	DCG	L02-05	RBMV	Turtle back	3-way dip, to NW and SE salt walls	minor	Triassic clay and salt
L02-FC	Gas	1997	DCG	L02-04	RBMVL	Turtle back	4-way dip	minor	Triassic clay and salt
L04-F	Gas	1994	DCG	L04-06	ROSLL	Tilted fault block below salt structure	bad data due to thick salt structure	major	Permian clay and salt
L04-G	Gas	1999	DCG	L04-09	ROSLL + DC	N-S trending fault block	fault closed	major	Permian clay and salt
L05-B+C	Gas	2002	DCG / TB	L05-B-01	ROSLL	E-W trending fault block	dip close to N and E	major	Permian clay and salt
L05-FA	Oil	1983	DCG	L05-03	SLC	Turtle back	4-way dip, possibly base KN unconformity	none	Lower Cretaceous clay
L05-FA	Gas	1983	DCG	L05-05-S1	RBMVL	Turtle back	4-way dip, high seismic amplitude (gas)	minor	Triassic salt and clay
L06-FA	Gas	1990	TB	L06-02	SLCFT	Salt structure	4-way dip	minor	Lower Cretaceous clay
L08-P1	Gas	1991	VH	L08-P-01, L08-13	ROSLL	Tilted fault block below salt structure	bad data due to thick salt structure	major	Permian clay and salt
L08-P3	Gas	1995	VH	L08-P-03	ROSLL	Tilted fault block below salt structure	bad data due to thick salt structure	major	Permian clay and salt
L08-P4	Gas	1996	VH	L08-P-04	ROSLL	Tilted fault block below salt structure	bad data due to thick salt structure	major	Permian clay and salt
L09-FB	Gas	1991	VB	L09-06	RBMV	Anticlinal dome	4-way dip	major fault below salt	Triassic clay and salt
L09-FC	Gas	1992	VH	L09-07-S1	RBM	Series of gas fields above	dip and fault closed to N and S	Hantum fault zone in the N	Triassic clay and salt
L09-FD	Gas	1993	VH	L09-08	RNSOF	reactivated fault blocks and salt walls	closed by salt walls to W and E		
L09-FF + L09-FG	Gas	1994	VH	L09-10	RBM + RNSOF	to the E and W			
L09-FH	Gas	1995	VH	L09-12	RBMVL				
L09-FI + L09-FJ	Gas	1996	VH	L09-11-S1	RBM + RNSOF				
M01-FA	Gas	1993	TB	M01-02	RBMVL	Anticlinal dome	to S and N: dip closed; salt walls to E and W	-	Triassic clay and salt
M07-FA	Gas	1996	TB	M07-05-S1	RBMVL	Anticlinal dome	to the N: fault closed	in Hantum Fault zone	Triassic clay and salt

[1] *structural elements:*

DCG	Dutch Central Graben
TB	Terschelling Basin
VH	Vlieland High
VB	Vlieland Basin
SHG	Schill Grund High


NCP-2A 12.1
Oil and gas fields
Oil gravity and gas composition
F16
F17
F18
G16
G17
F18-FA
SLCF
API=34-39
G16-FA
94
40
SGGS
F17-FA
API=35.4
API=30.6
SLCF
FB
L02-FB
92
38
RBMVL
L01
L02
L03
M01
M02
L02-FA
92
36
RBMVL
L01-FB
API=32.6
SLCF
L02-FC
RBMVL
M01-FA
RBMVL
L04-F
ROSLL
L04-G
91
38
ROSLL-DC
L04
L05-FA
SLC
RBMVL
L05
L06-FA
L06
SLCTS
87
40
M04
M05
L05-B
ROSLL
L05-C
ROSLL
L08-07
91
38
ROSLL
L07
L08
94
40
L09-FC
RBMVL
L09
92
42
FD
RNSOF
91
42
FF
FG
RNSOF
FH
86
40
RBMVL
FJ
RNSOF
RBMVL
M07-FA
RBMVL
M07
M
L08-G
ROSLL
91
39
L09-FE
ROSLL
92
39
L09-FA
ROSLL
91
40
L09-FB
RBMVL
84
43
L11
L12
M10
M11
N
Projection UTM3, Ellipsoid ED50
0
5
10
15
20
km
5°0'0"E
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
2A
Legend
gas field
oil field
oil and gas field
M07-FA field name
RBMVL strat_code
API =30.6 gravity of oil
94 Mol% C1/total gas
40 GHV (MJ/m³)

Annex L3

Measured vitrinte reflectance values

The results of the vitrinite reflectance measurements are presented by their statistics (average value, standard deviation and number of measurements per sample) and a label describing the reliability of the measurement.

On the basis of the number of measurements and the standard deviation a statement can be made on the 'reliability' of the measurement. The criteria are given in the table below.

A	High reliability, (Stdv □ 0.05; N □ 40)
B	Average reliability, (0.05 □ Stdv □ 0.10; 15 □N □ 40)
C	Low reliability, (Stdv □ 0.10; N □ 15)

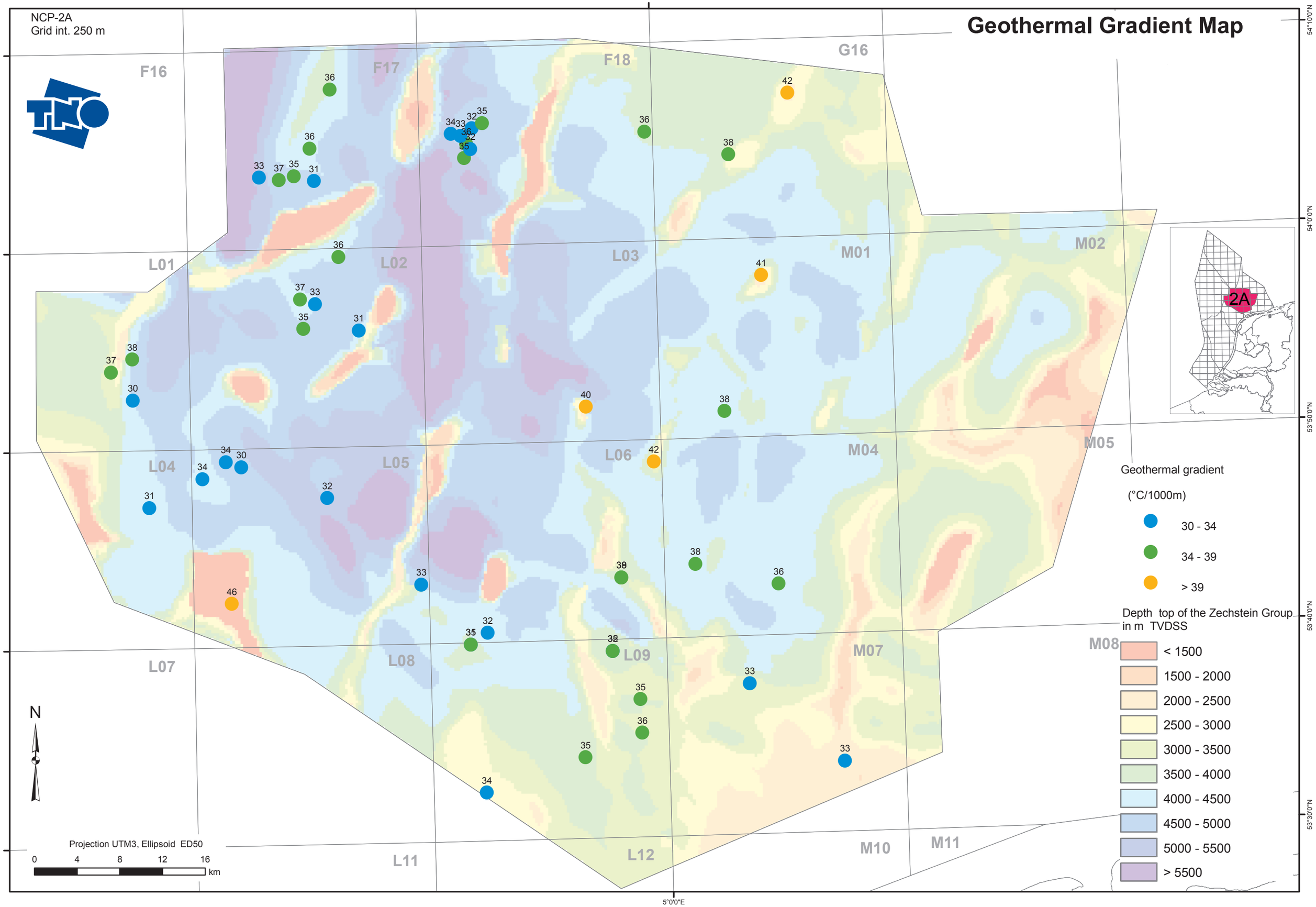
In some cases two reflectance populations are recognised in the histogram. In such cases two additional histograms (including their statistics) of the two individual populations are given.

Summary of the vitrinite reflectance measurements. %Rr = mean random reflectance; SD = standard deviation; N = number of measurements; A = high reliability; B = average reliability C = low reliability; mp = multiple populations. Areas indicated in grey represent the individual populations as calculated from the values of the original sample.

Labcode	Well	Depth top	%Rr	SD	N	Reliability	Stratigraphy
2005100378	F14-04	1100,00	0,77	0,33	30	C	NMRF
2005100375	F14-04	2160,00	0,62	0,27	100	mp	SLCP
2005100375	F14-04	2160,00	0,48	0,07	78	B	SLCP
2005100375	F14-04	2160,00	1,09	0,19	22	C	SLCP
2005100373	F14-04	2800,00	1,00	0,31	100	mp	ATRT
2005100373	F14-04	2800,00	0,72	0,08	47	B	ATRT
2005100373	F14-04	2800,00	1,26	0,20	53	C	ATRT
2005100385	F14-06	1120,00	0,67	0,32	58	C	NMRF
2005100384	F14-06	1672,00	0,55	0,28	100	mp	SLCP
2005100384	F14-06	1672,00	0,42	0,05	78	B	SLCP
2005100384	F14-06	1672,00	1,03	0,26	21	C	SLCP
2005100382	F14-06	1828,00	0,76	0,30	100	mp	SLCP
2005100382	F14-06	1828,00	0,53	0,06	57	B	SLCP
2005100382	F14-06	1828,00	1,08	0,20	43	C	SLCP
2005100380	F14-06	1939,00	1,03	0,30	100	mp	ATAL
2005100380	F14-06	1939,00	0,50	0,06	14	B	ATAL
2005100380	F14-06	1939,00	1,12	0,22	86	C	ATAL
2005081109	F17-03	260,00	0,23	0,08	5	C	NS
2005081112	F17-03	1830,00	1,23	0,17	100	B	KNNC
2005081115	F17-03	1910,00	0,86	0,36	100	mp	SGKIG
2005081115	F17-03	1910,00	0,42	0,06	34	B	SGKIG
2005081115	F17-03	1910,00	1,09	0,21	66	C	SGKIG
2005081124	F17-03	2110,00	0,91	0,40	100	mp	ATAL
2005081124	F17-03	2110,00	0,41	0,09	29	B	ATAL
2005081124	F17-03	2110,00	1,11	0,27	71	C	ATAL
2005081133	F17-04	2420,00	0,69	0,31	100	mp	SLCFM

2005081133	F17-04	2420,00	0,50	0,07	70	B	SLCFM
2005081133	F17-04	2420,00	1,14	0,13	30	B	SLCFM
2005081137	F17-04	2590,00	1,04	0,34	100	mp	ATPO
2005081137	F17-04	2590,00	0,67	0,13	37	B	ATPO
2005081137	F17-04	2590,00	1,26	0,22	63	C	ATPO
2005081142	F17-05	1060,00	0,90	0,30	52	C	NS
2005081148	F17-05	1990,00	0,94	0,35	100	mp	SLCFM
2005081148	F17-05	1990,00	0,47	0,08	29	B	SLCFM
2005081148	F17-05	1990,00	1,13	0,21	71	C	SLCFM
2005081155	F17-05	2330,00	1,08	0,35	100	mp	ATAL
2005081155	F17-05	2330,00	0,54	0,13	25	C	ATAL
2005081155	F17-05	2330,00	1,25	0,18	75	C	ATAL
2005100397	F17-07	1070,00	0,97	0,34	100	C	NLFFT
2005100391	F17-07	2110,00	0,69	0,31	100	mp	SLCFR
2005100391	F17-07	2110,00	0,47	0,05	62	A	SLCFR
2005100391	F17-07	2110,00	1,04	0,19	38	C	SLCFR
2005100387	F17-07	2250,00	0,96	0,29	100	C	ATPO
2005061568	G17-01	2721,86	1,56	0,23	50	C	KNNC
2005061566	G17-01	2779,78	1,42	0,27	21	C	KNNSF
2005061573	G17-01	3934,97	1,00	0,16	100	C	DC
2005061578	G17-02	2600,00	1,52	0,18	27	C	KNNC
2005061579	G17-02	3400,00	0,56	0,07	11	B	ZEZ1K
2005061574	G17-02	4385,00	1,06	0,12	100	B	DC
2005073617	L01-04	330,00	0,44	0,35	100	mp	NU
2005073617	L01-04	330,00	0,22	0,07	70	B	NU
2005073617	L01-04	330,00	0,95	0,16	30	B	NU
2005073619	L01-04	2595,00	1,27	0,23	56	C	KNGLM
2005073621	L01-04	3225,00	1,40	0,26	3	C	ZEZ1K
2005073624	L01-04	3785,00	0,98	0,07	100	B	DC
2005061590	L01-06	2826,00	0,27	0,05	50	A	KNNC
2005061587	L01-06	3584,00	4,00	2,85	2	C	ZEZ1K
2005090959	L02-02	2574,00	1,02	0,28	100	C	ATPO
2005090955	L02-02	3014,00	1,34	0,29	100	C	ATAL
2005090953	L02-02	3302,00				barren	RNROM
2005090973	L02-05	1944,00	0,47	0,22	50	mp	SLCFM
2005090973	L02-05	1944,00	0,38	0,09	39	B	SLCFM
2005090973	L02-05	1944,00	0,82	0,19	11	C	SLCFM
2005090970	L02-05	2035,00	0,54	0,24	100	mp	ATAL
2005090970	L02-05	2035,00	0,44	0,07	83	B	ATAL
2005090970	L02-05	2035,00	1,05	0,13	17	B	ATAL
2005090980	L02-05	2940,00	1,35	0,32	100	C	ATAL
2005090987	L02-07	2040,00	1,01	0,34	100	C	ATPO
2005102999	L03-02	1600,00	1,21	0,17	57	B	N
2005102998	L03-02	2050,00	1,11	0,22	82	C	KNNL
2005102991	L03-02	2710,00	1,18	0,25	26	C	SGKIG
2005102984	L03-02	3250,00	2,12	0,26	81	C	ATAL
2005102982	L03-02	3505,00	2,19	0,31	55	C	RNKPL
2005103012	L03-03	1440,00					N

2005103011	L03-03	1550,00	0,82	0,18	40	C	KNNC
2005103004	L03-03	2355,00	1,09	0,53	31	C	SGKI
2005103003	L03-03	2430,00				barren	SLCFO
2005103001	L03-03	2740,00	0,72	0,11	100	B	SLCFR
2005110316	L06-01	2675,00	1,43	0,27	30	C	KNNCM
2005110312	L06-01	3162,00	1,27	0,39	11	C	CG
2005073612	L15-01	2474,00	0,98	0,39	100	mp	KNNC
2005073612	L15-01	2474,00	0,51	0,07	34	B	KNNC
2005073612	L15-01	2474,00	1,22	0,24	66	C	KNNC
2005073614	L15-01	2570,00	0,93	0,36	100	mp	SLDZL
2005073614	L15-01	2570,00	0,50	0,09	32	B	SLDZL
2005073614	L15-01	2570,00	1,13	0,23	68	C	SLDZL
2005073609	L15-01	2832,00	0,84	0,34	100	C	ZEZ1K
2005073607	L15-01	3106,00	0,55	0,33	100	mp	DC
2005073607	L15-01	3106,00	0,27	0,04	55	A	DC
2005073607	L15-01	3106,00	0,90	0,15	45	B	DC
2005110329	L15-03	2590,00	1,13	0,36	20	C	KNNCM
2005110326	L15-03	2780,00	1,13	0,28	75	C	SGKI
2005110324	L15-03	2930,00	1,10	0,43	4	C	ZEZ1C
2005110323	L15-03	3230,00	1,34	0,24	49	C	DCCM
2005110322	L15-04	2120,00	0,89	0,17	20	C	KNNCM
2005110319	L15-04	2460,00	0,78	0,37	34	mp	SGKI
2005110319	L15-04	2460,00	0,38	0,12	15	B	SGKI
2005110319	L15-04	2460,00	1,09	0,09	19	B	SGKI
2005073650	M03-01	2155,00	1,30	0,20	100	B	KN
2005073636	M03-01	4200,00	1,00	0,06	100	B	DC
2005073647	M03-01	4468,00	1,31	0,08	100	B	DC
2005073632	M08-01	1960,00	1,31	0,24	100	C	KN
2005073630	M08-01	3280,00	2,41	0,60	30	C	ZEZ1K
2005073626	M08-01	3750,00	0,94	0,07	100	B	DC
2005073634	M10-04	3461,00	0,94	0,05	100	A	DC


NCP-2A
Grid int. 250 m
Geothermal Gradient Map
F16
F17
F18
G16
L01
L02
L03
M01
M02
L04
L05
L06
M04
M05
L07
L08
L09
M07
M08
L11
L12
M10
M11
2A
Geothermal gradient
(°C/1000m)
30 - 34
34 - 39
> 39
Depth top of the Zechstein Group
in m TVDSS
< 1500
1500 - 2000
2000 - 2500
2500 - 3000
3000 - 3500
3500 - 4000
4000 - 4500
4500 - 5000
5000 - 5500
> 5500
N
Projection UTM3, Ellipsoid ED50
0 4 8 12 16 km
54°10'0"N
54°0'0"N
53°50'0"N
53°40'0"N
53°30'0"N
5°0'0"E

Annex N