

Normal Merensky Reef in Proximity to the Regional Pothole Sub-Facies of the Zwartklip Facies, Upper Critical Zone, Western Bushveld Complex

D. S. Smith

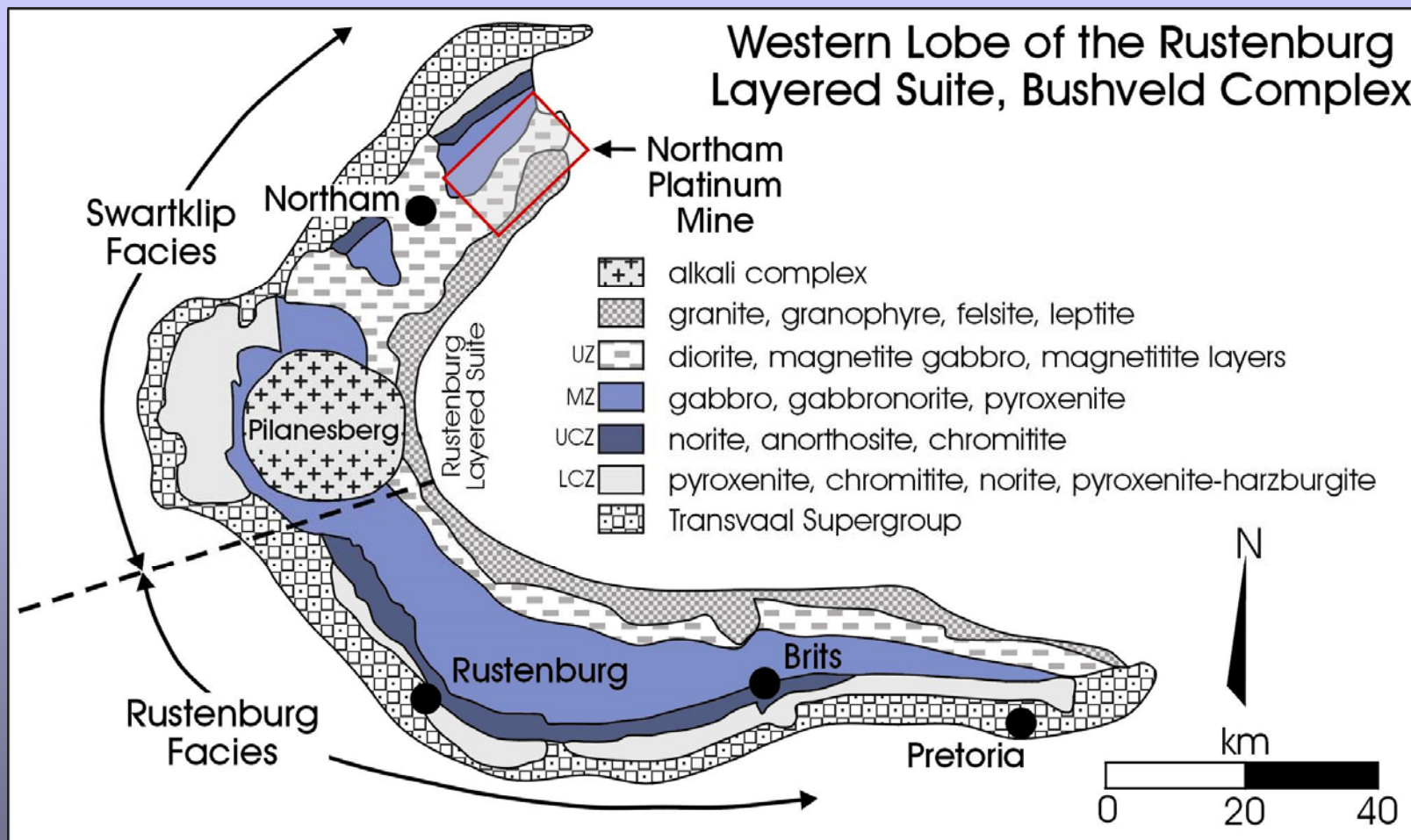
Geology Department, Northam Platinum Mine

I. J. Basson * and D. L. Reid

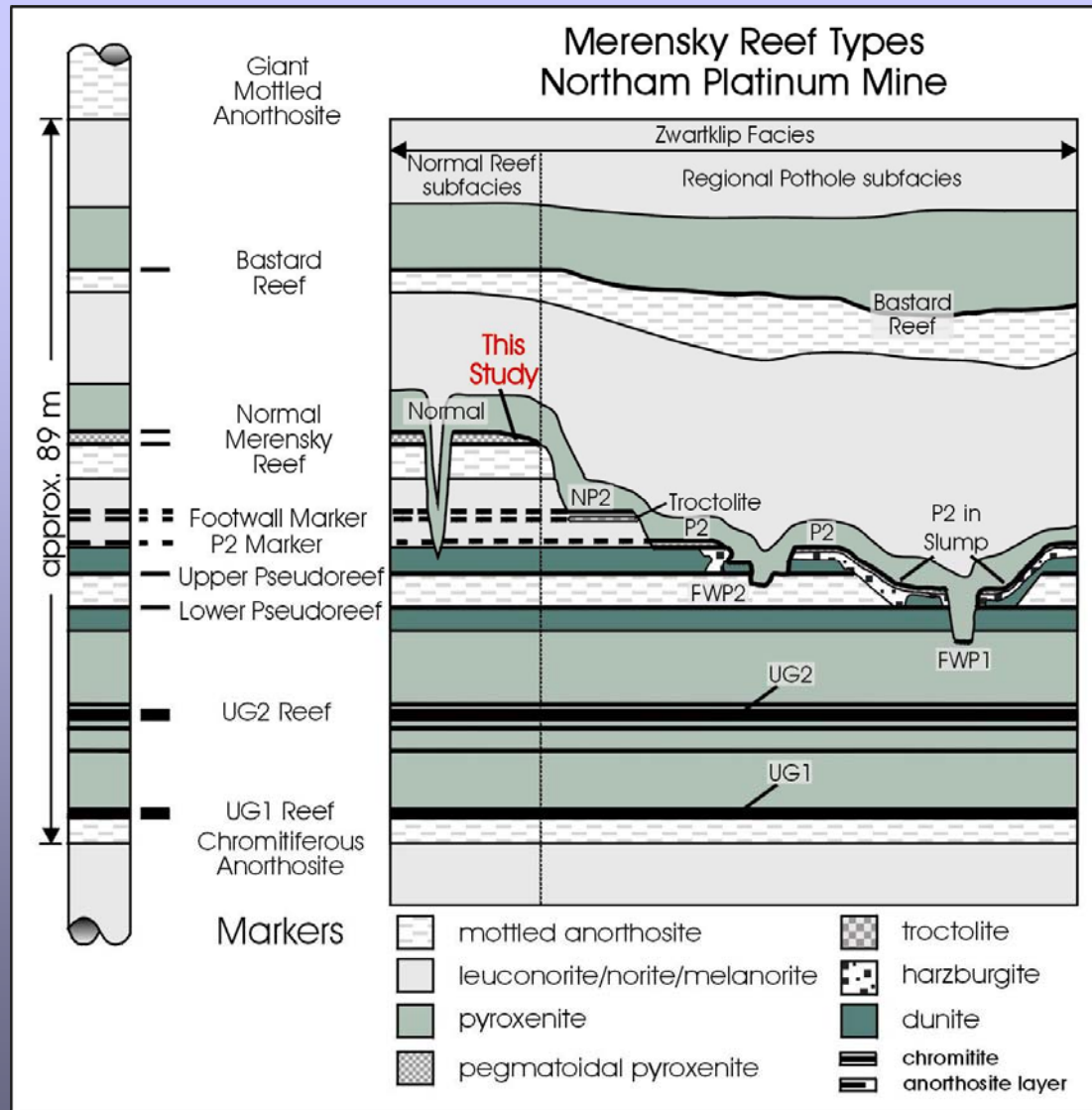
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(* Presenting)



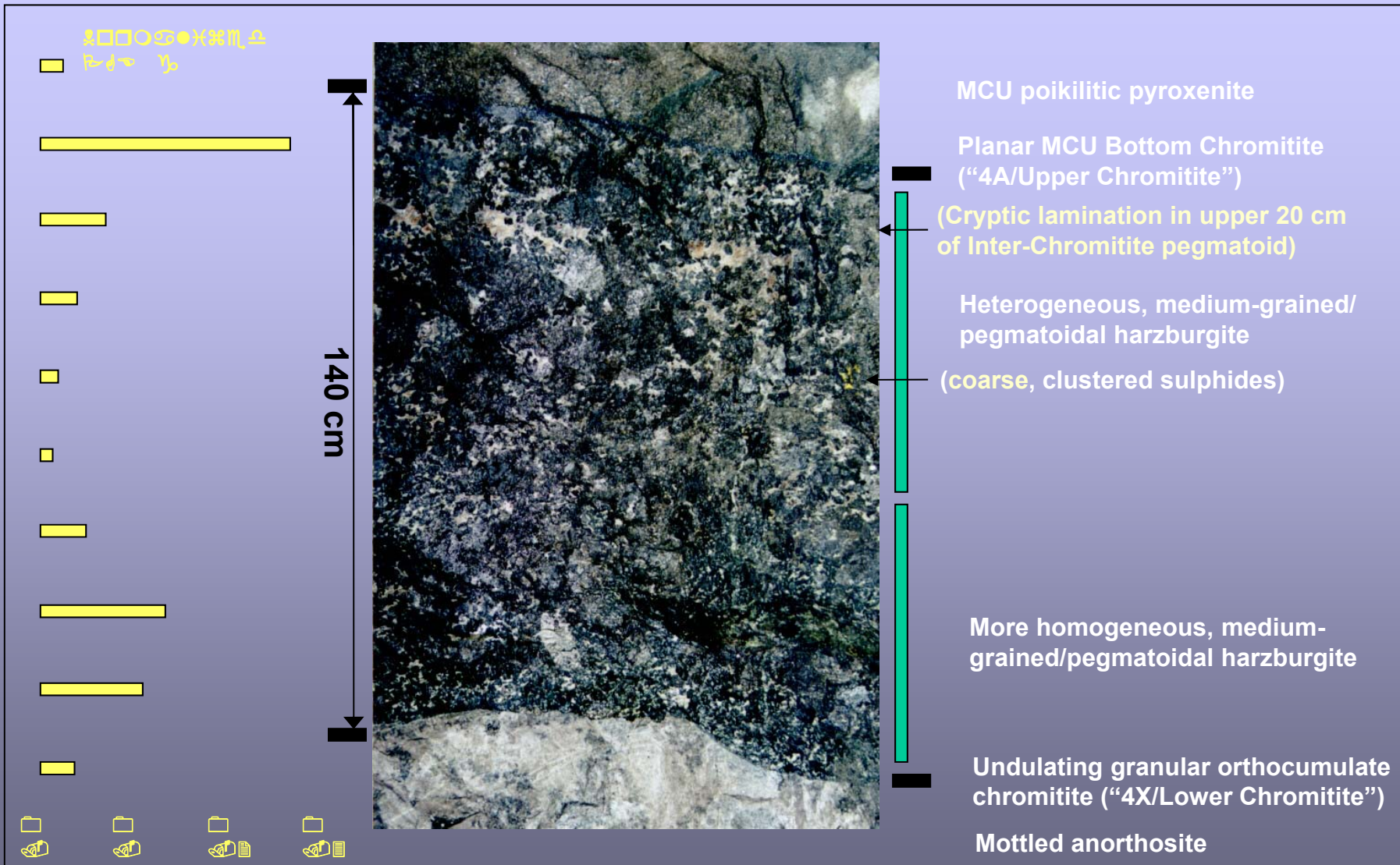


Modified after Viljoen (1994), Eales and Cawthorn (1996), Viring and Cowell (1999)



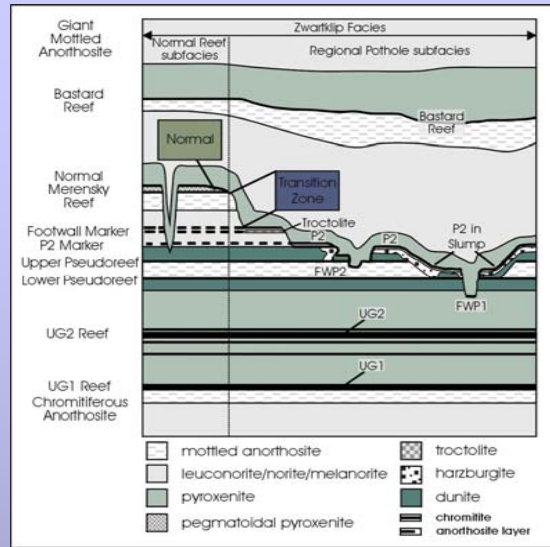
Modified after Viring and Cowell (1999)



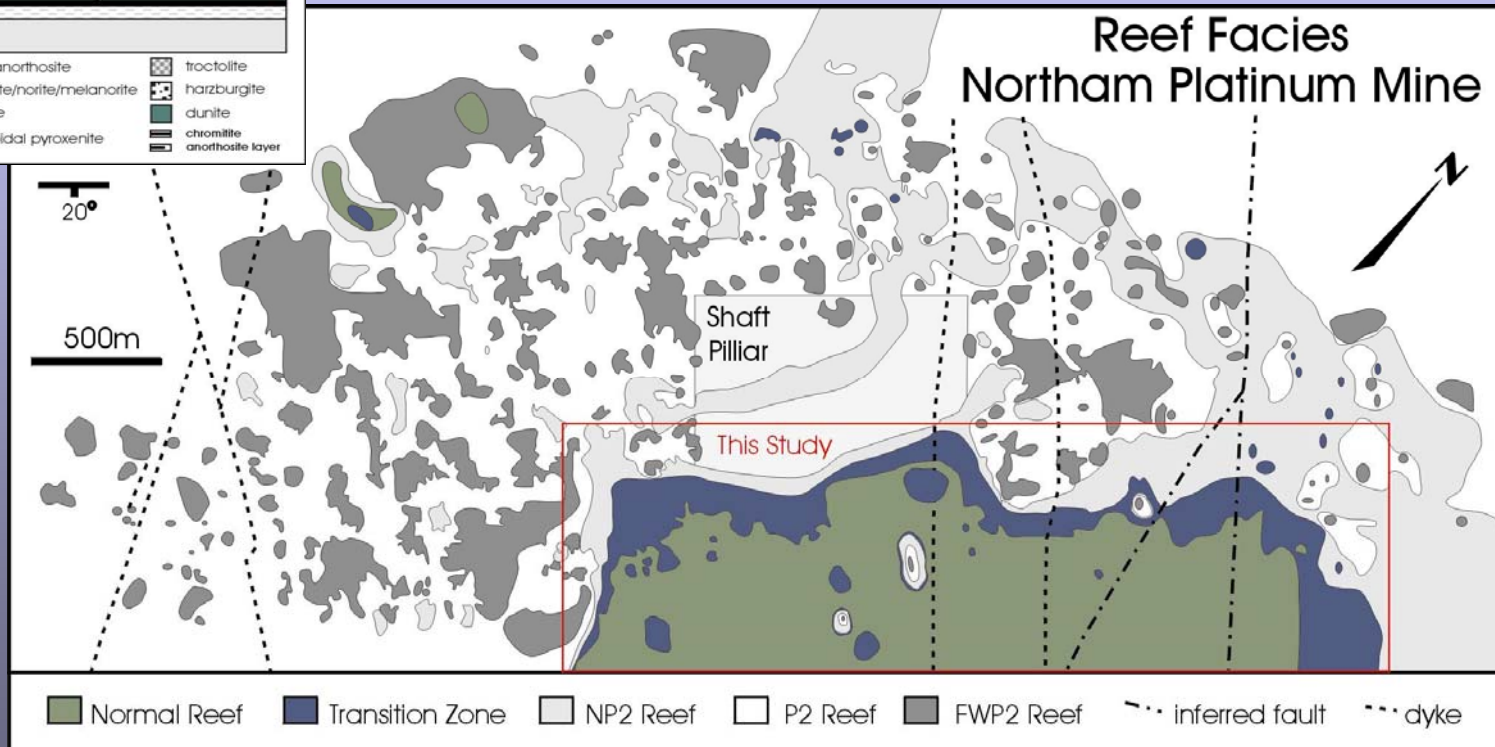


Typical section and PGE g profile through Normal Merensky Reef (note that the Inter-Chromitite harzburgite and dunite are not developed in this example)



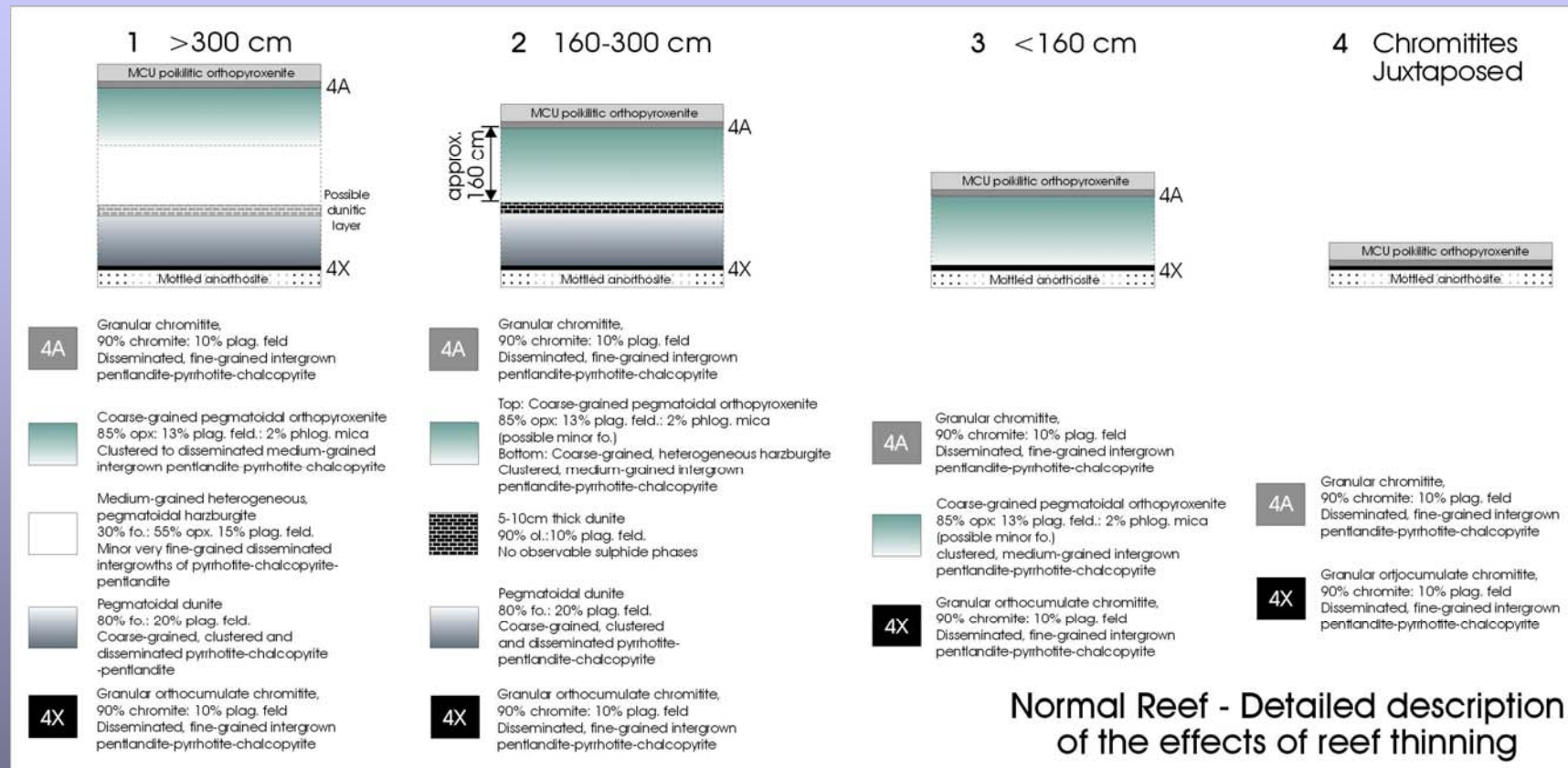


- | | | | |
|--|-------------------------------|--|------------------------------|
| | mottled anorthosite | | troctolite |
| | leuconorite/norite/melanorite | | harzburgite |
| | pyroxenite | | dunite |
| | pegmatoidal pyroxenite | | chromitite anorthosite layer |



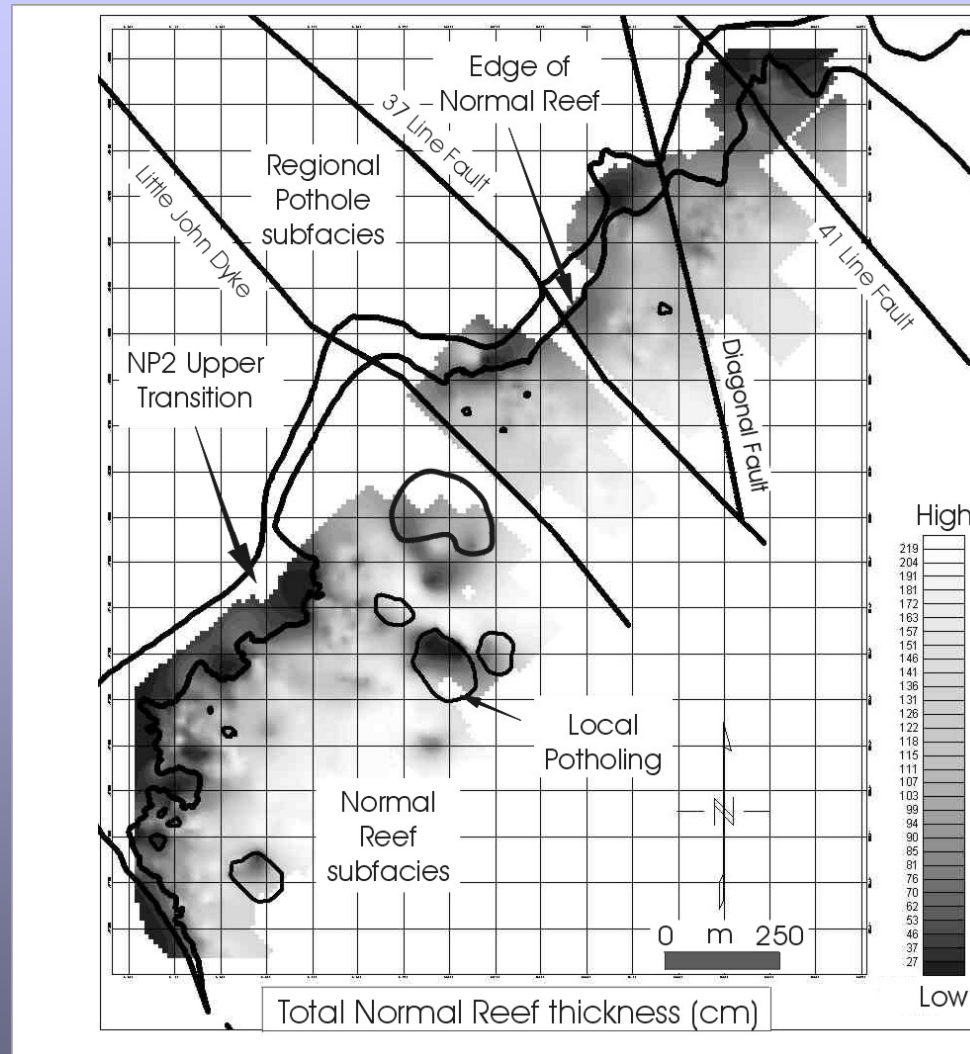
Compiled from 1:1000 and 1:200 Scale Geological Maps





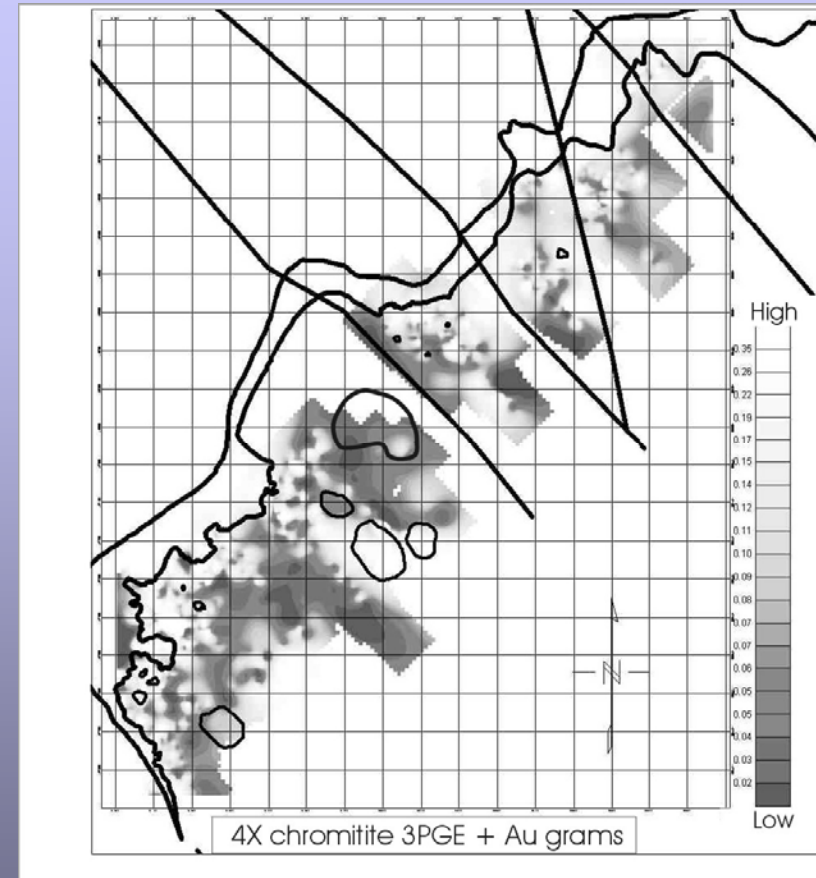
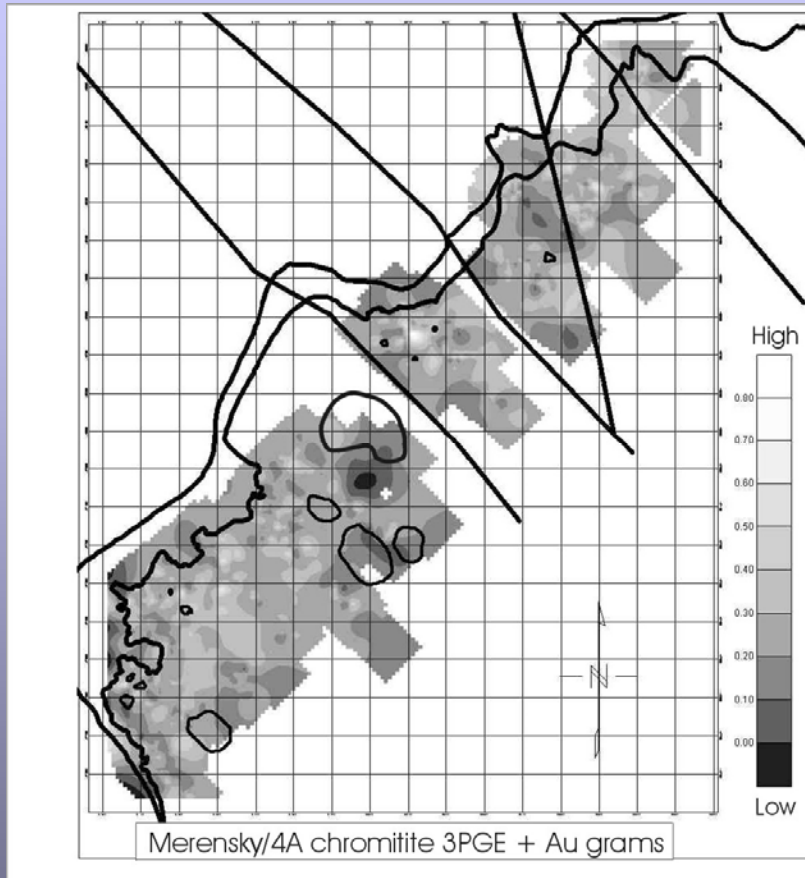
Compiled from underground observations by Geology and Sampling Departments





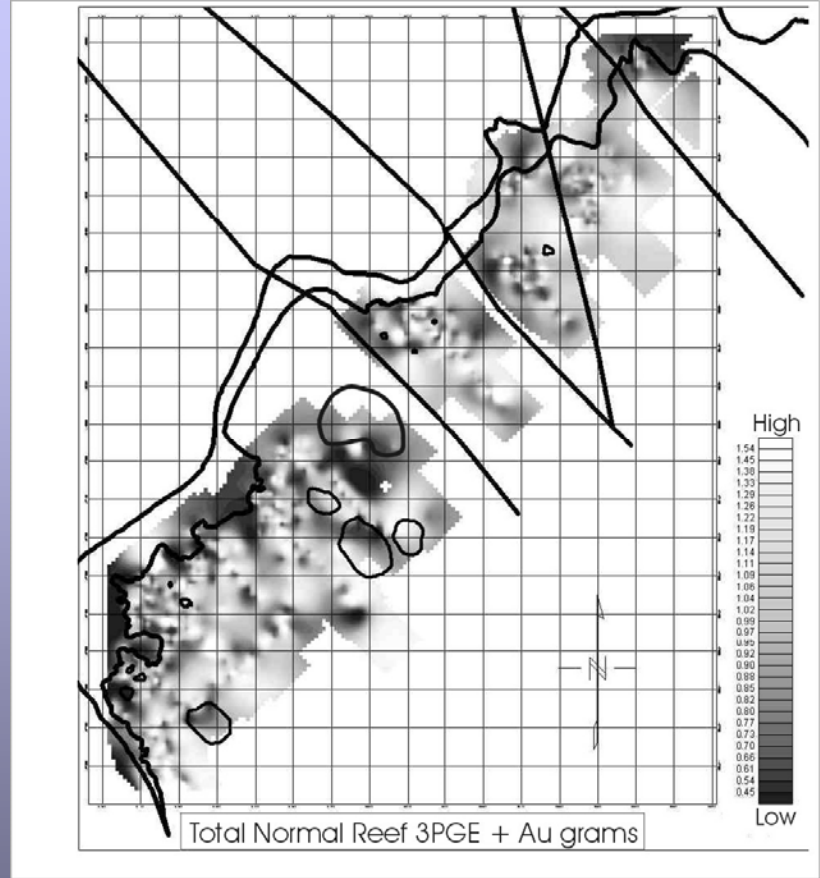
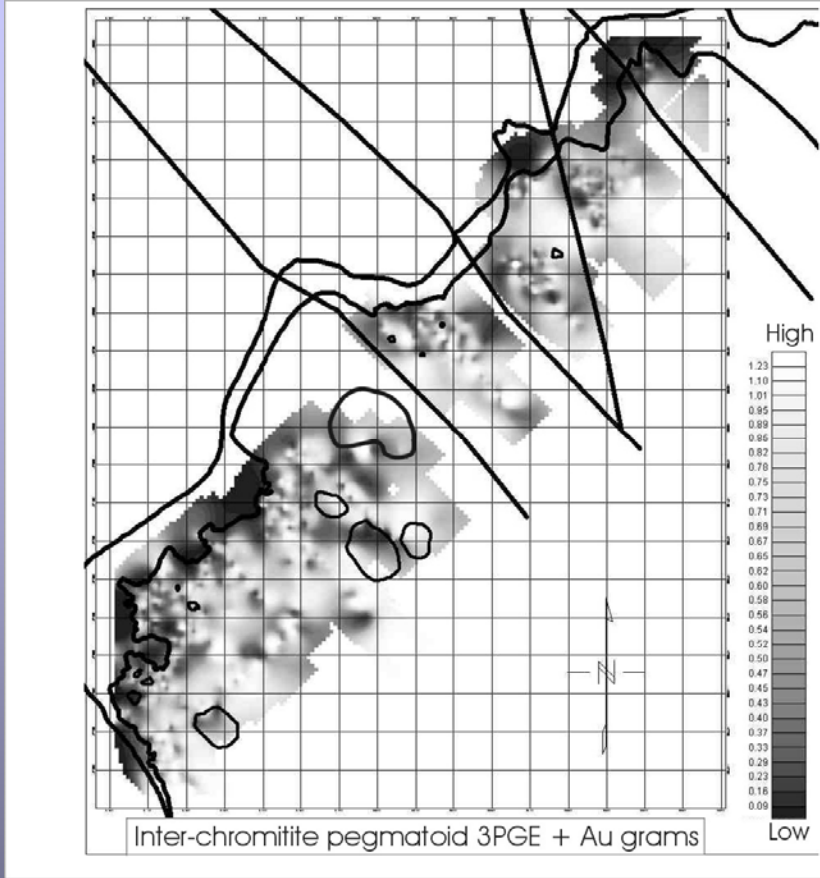
Oasis Montaj Plots of data obtained by Geology and Sampling Departments





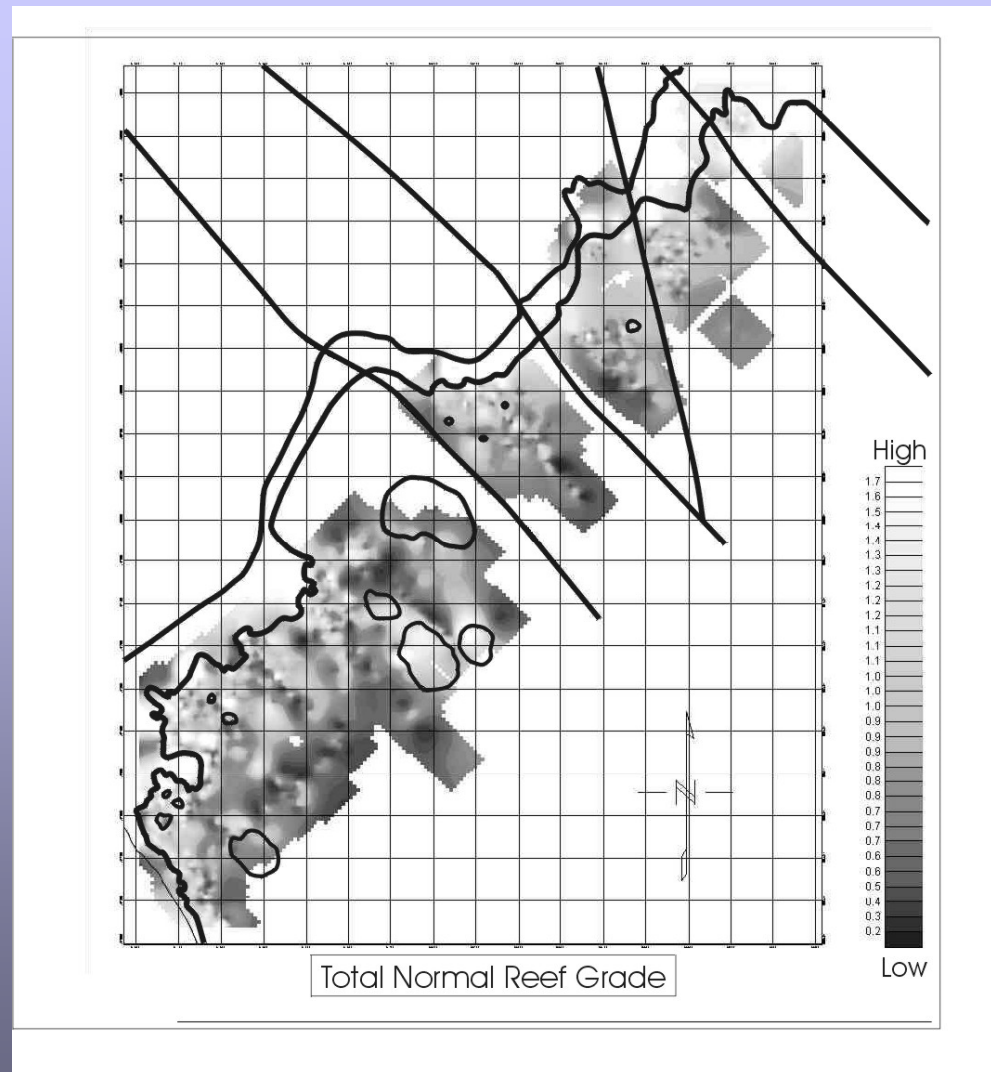
Oasis Montaj Plots of data obtained by Geology and Sampling Departments





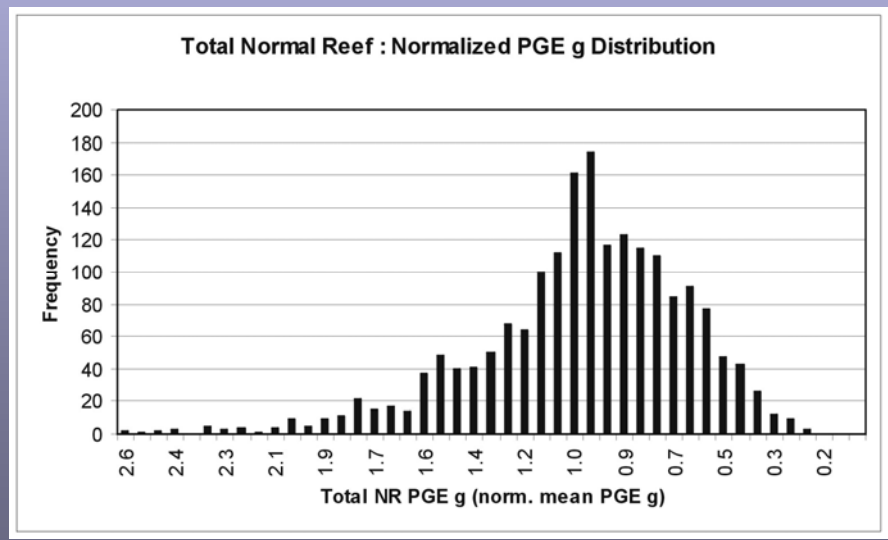
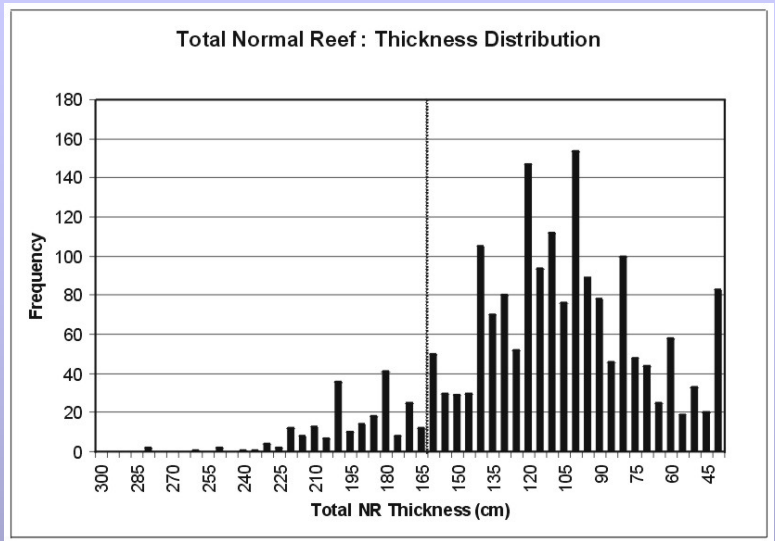
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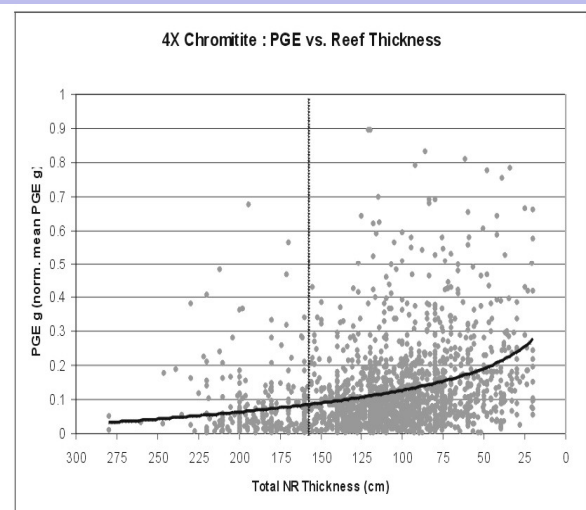
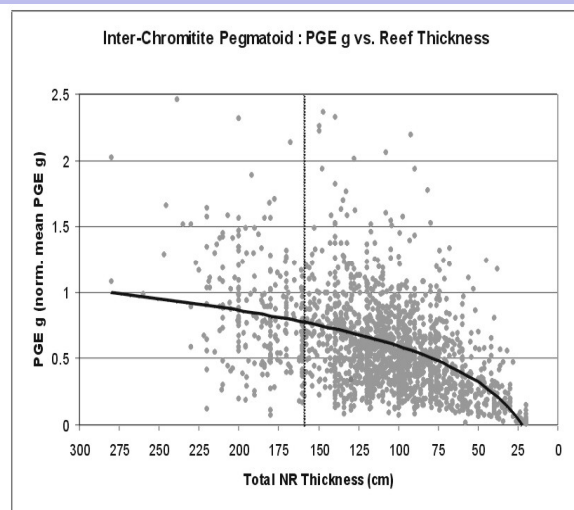
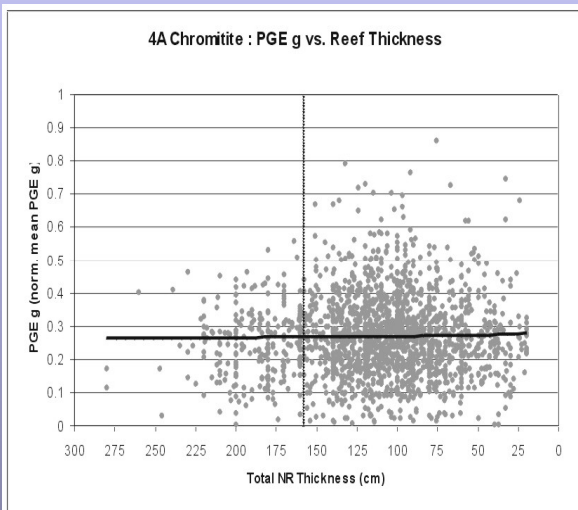




Data obtained by Geology and Sampling Departments

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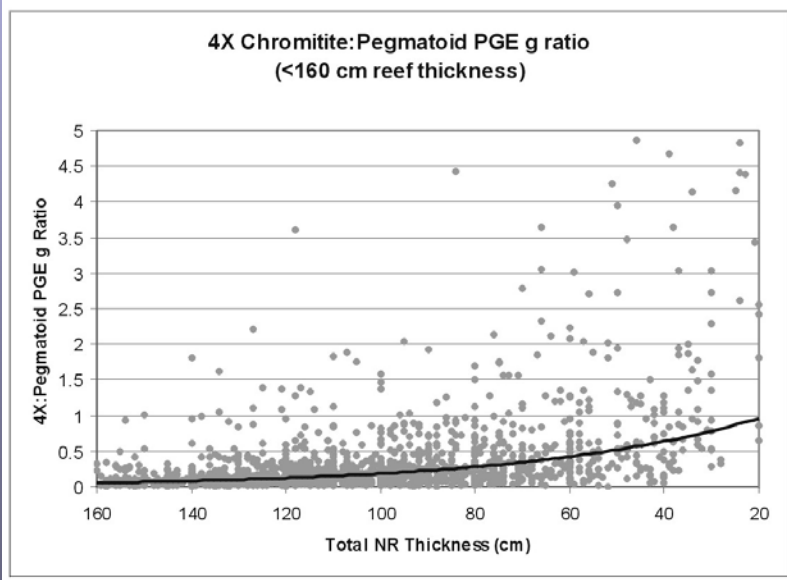
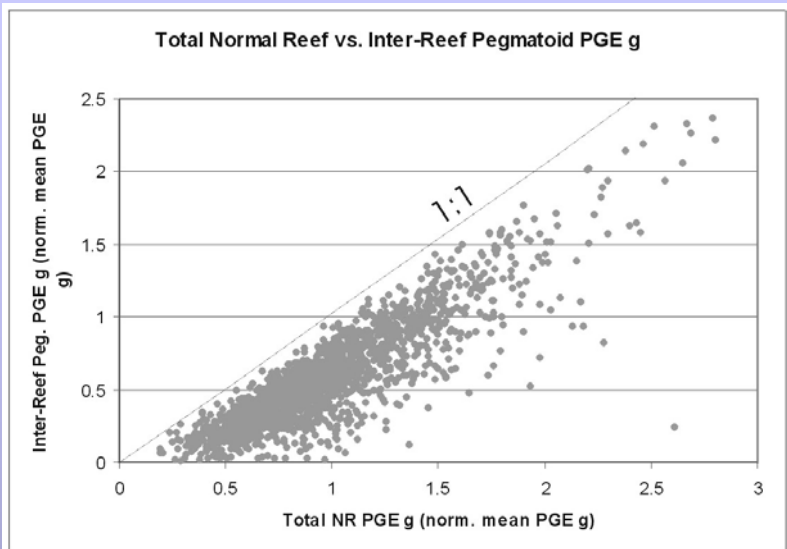




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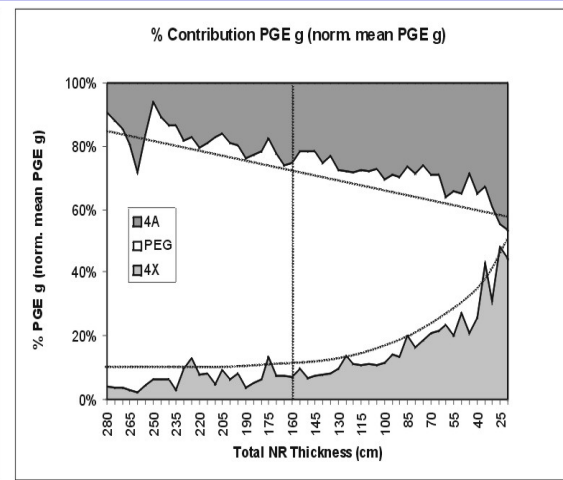
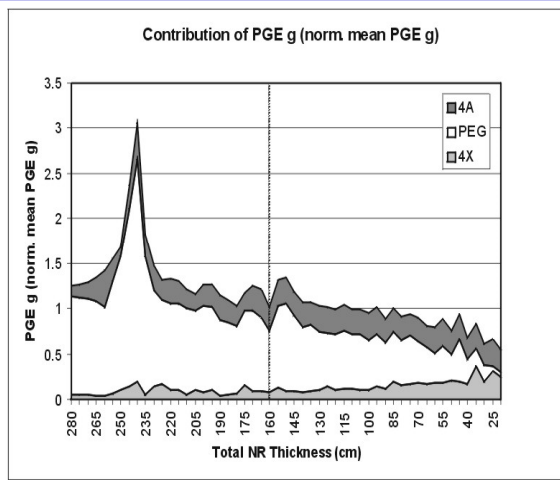
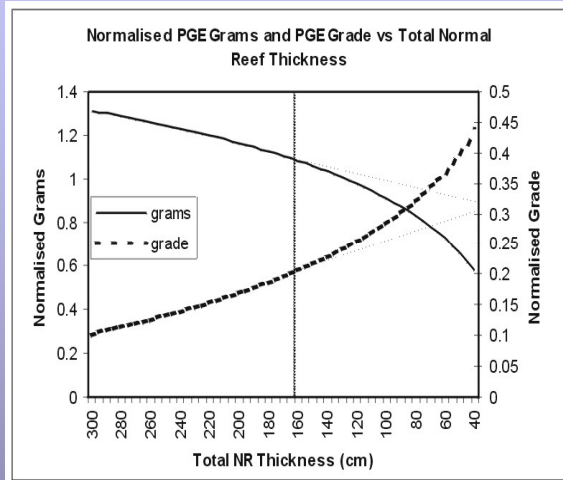




Data obtained by Geology and Sampling Departments

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Conclusions

- Systematic changes in reef morphology/lithologies are evident in the 320 cm to 0 cm reef thickness interval; these include the loss of the medium-grained pegmatoidal orthopyroxenite in the 300-160 cm thickness interval
- Relatively dramatic changes in reef morphology, PGE g and Grade occur below Inter-Chromitite reef thickness of 160 cm, possibly corresponding to the thermomechanical “breaching” of a relatively impermeable dunite layer
- Total Normal Reef PGE g and Grade correlate strongly with PGE g/Grade of the Inter-Chromitite Pegmatoid
- 4X and Inter-Chromitite Pegmatoid PGE g display lognormal relationships to Reef Thickness
- PGE g and Grade display an inverse (lognormal) relationship to one another
- A PGE-rich sulphide zone above the 4X/Lower Chromitite becomes progressively more evident with reef thinning and is included in routine sampling of the 4X Chromitite – prioritising the extraction of the lower chromitite, based on such data, is probably erroneous when applied to thicker Normal Reef
- The 4A/Upper Chromitite (Merensky Chromitite) is a “drape” and has a regular/consistent PGE content and is usually more planar than the undulating 4X chromitite

