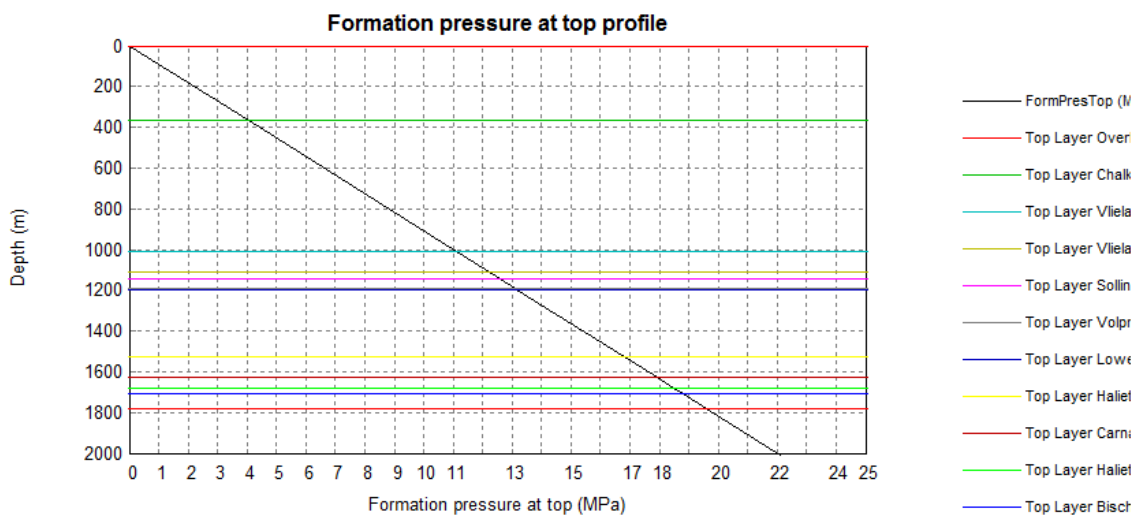
Nedmag TR2 brine leakage study

Panterra Geoconsultants

Scope of Work

- Carry out fracture propagation study in order to improve understanding of what happened during leakage event on 20 April 2018

Layers in the model



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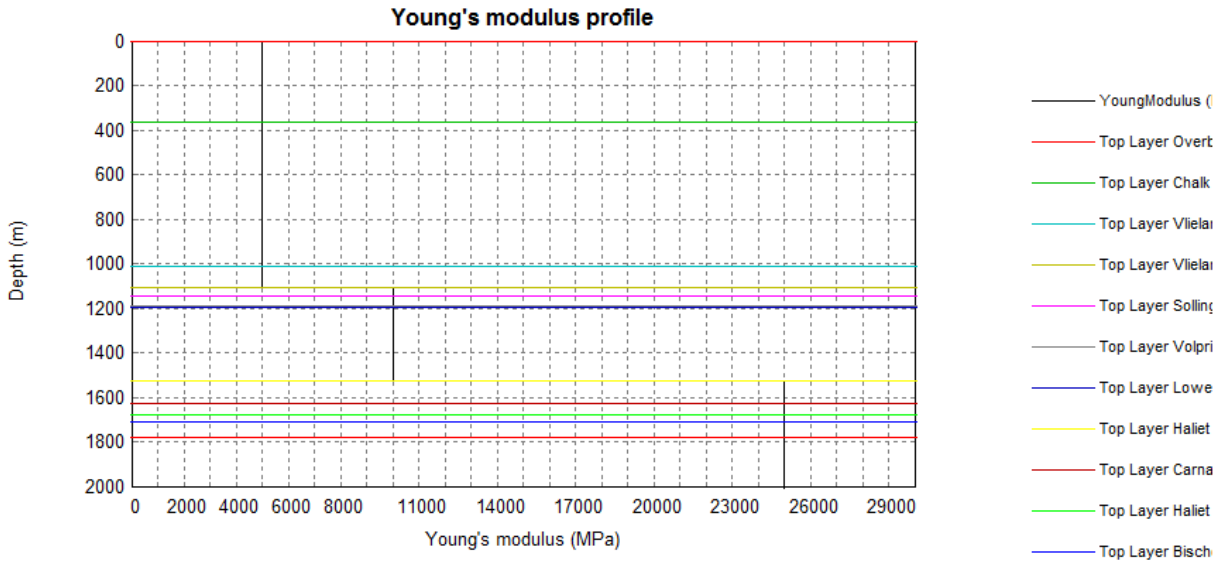
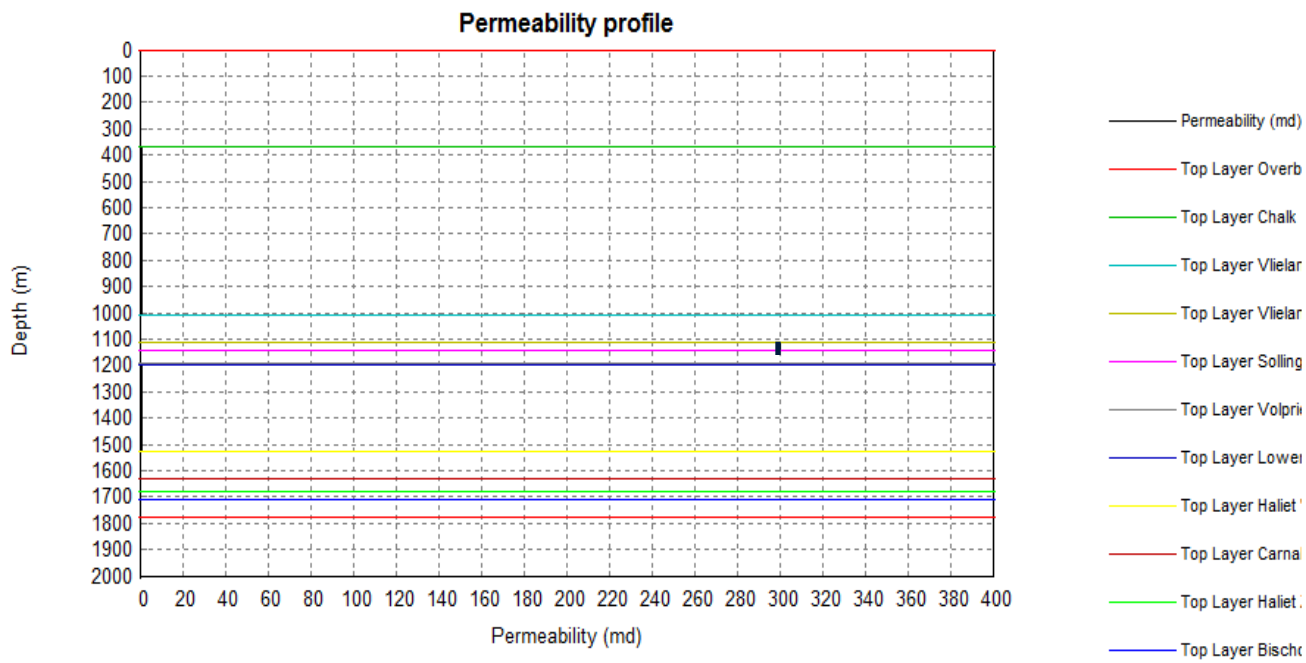
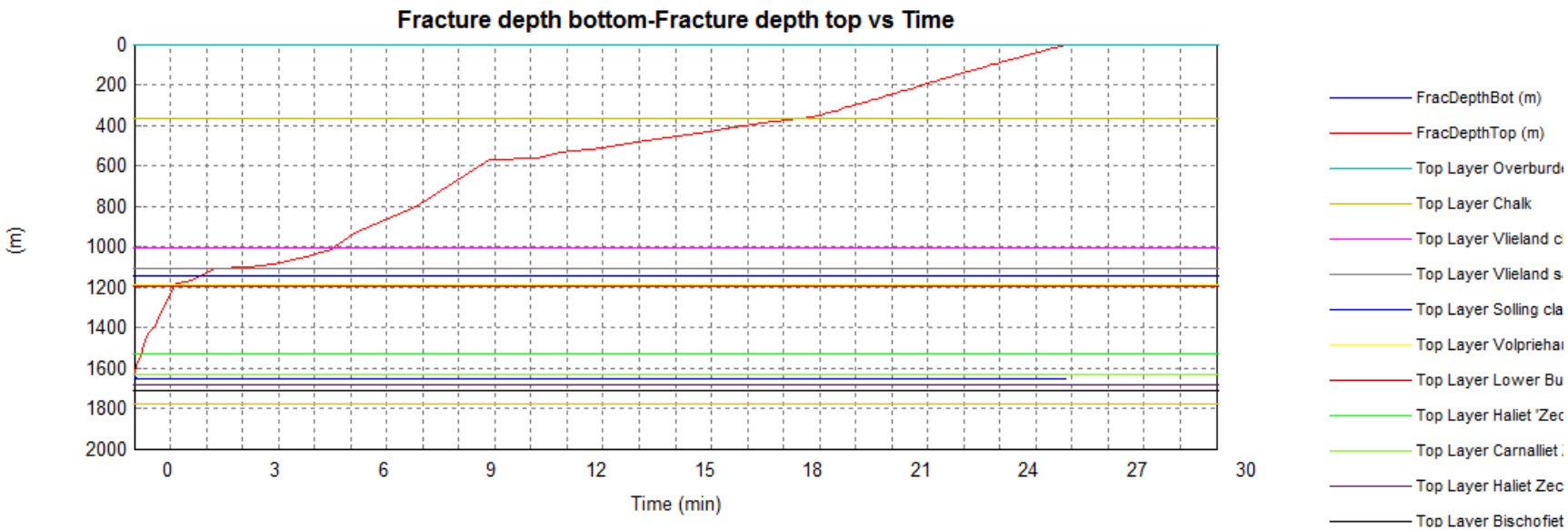
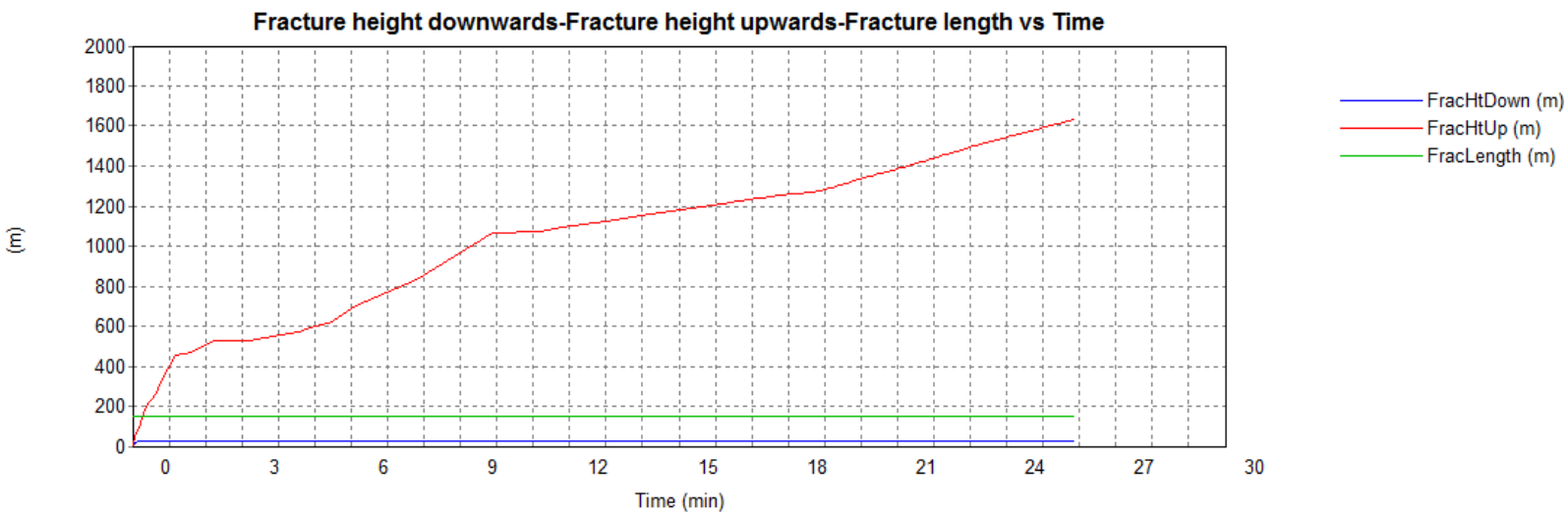




Base case $k_{Vlieland}$ = 300 mD

First injection cycle @ 1,2 million m3/d





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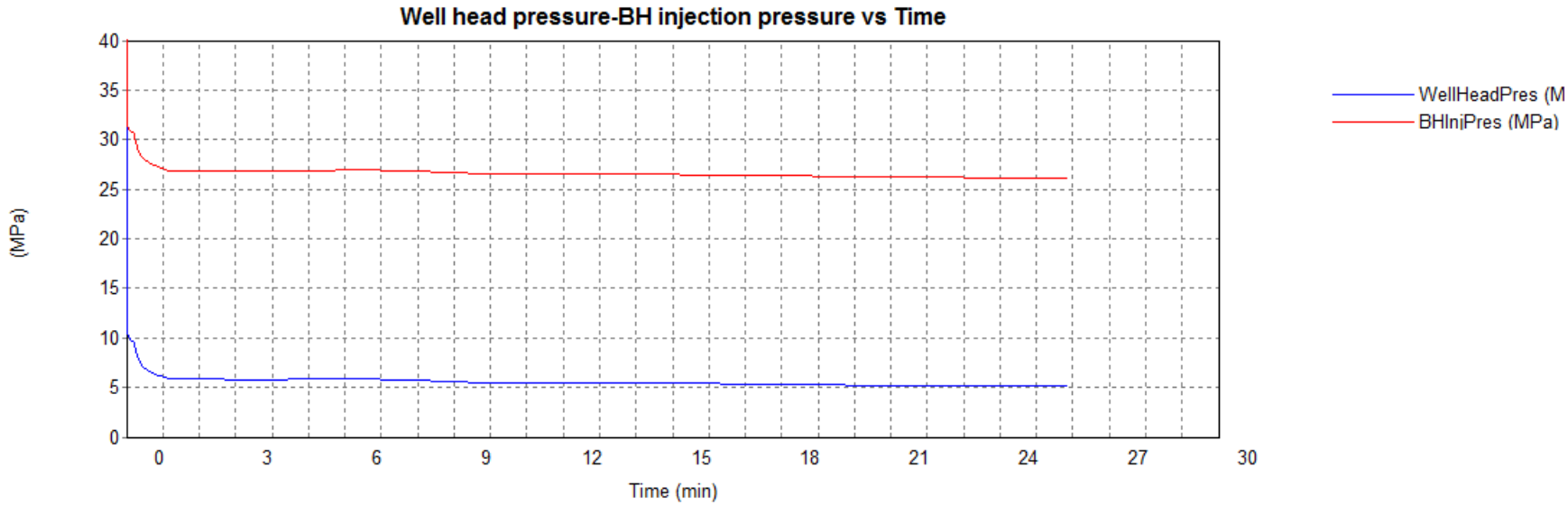
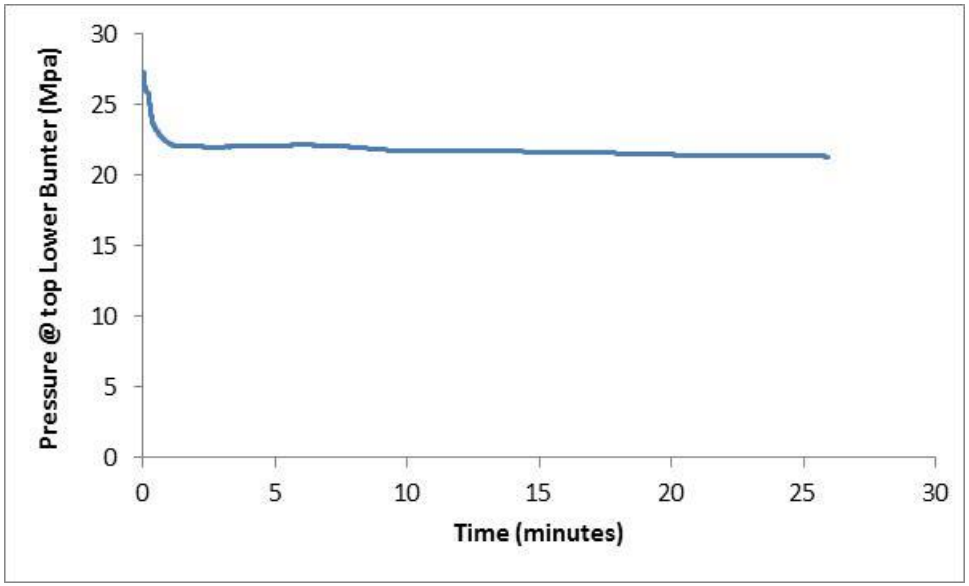
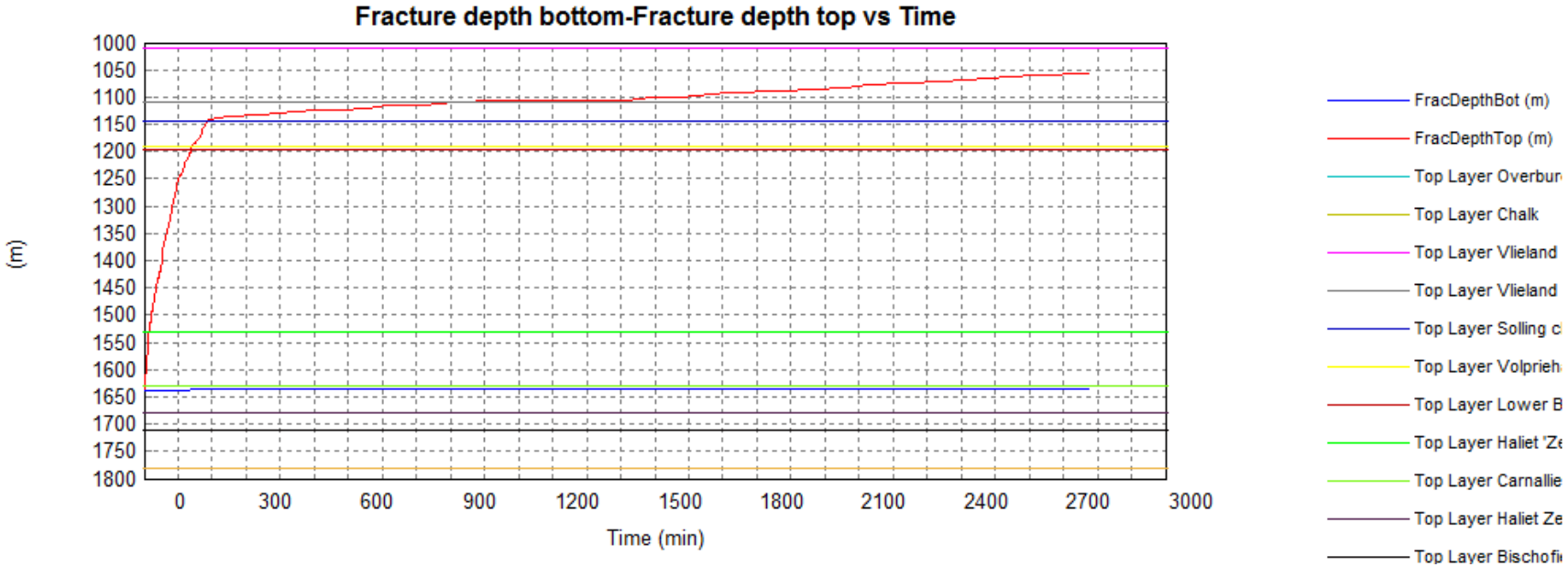
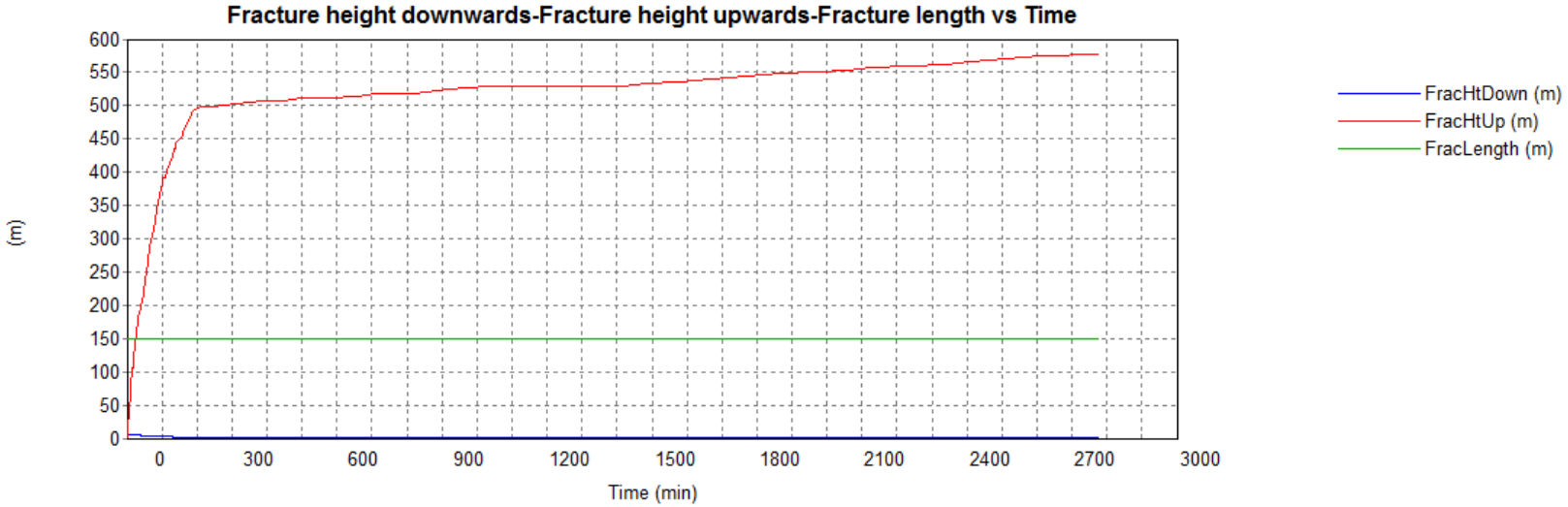




Base case $k_{Vlieland}$ = 300 mD

Second injection cycle @ 25200 m3/d for 47,5 hours





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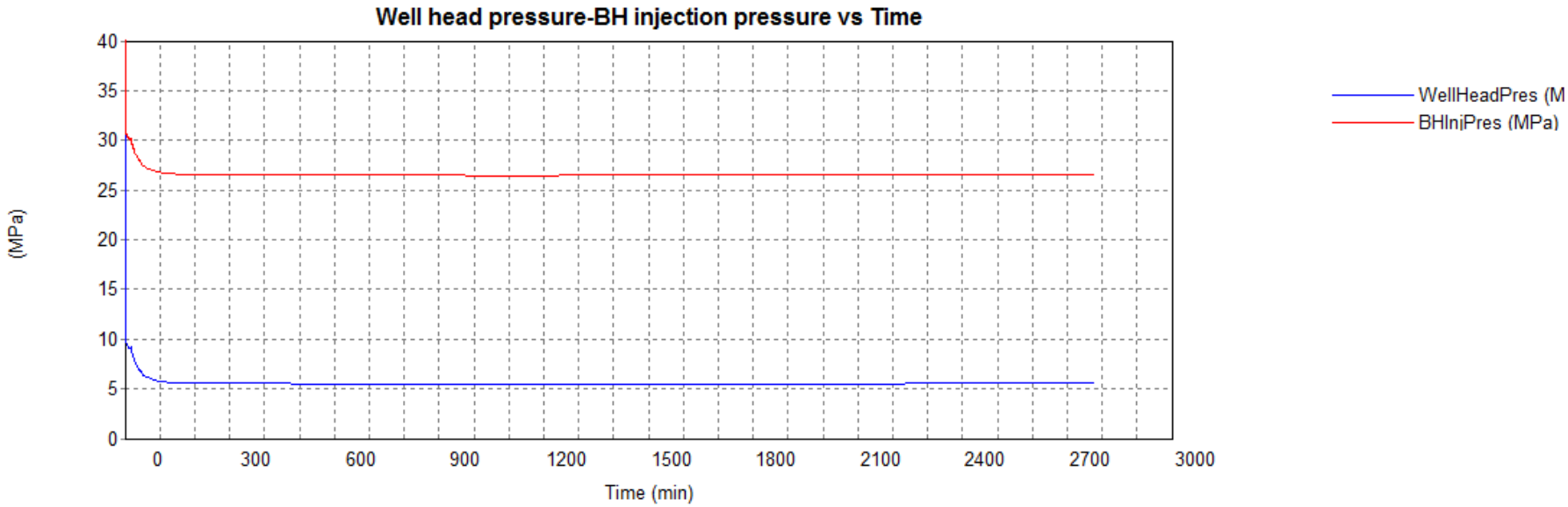
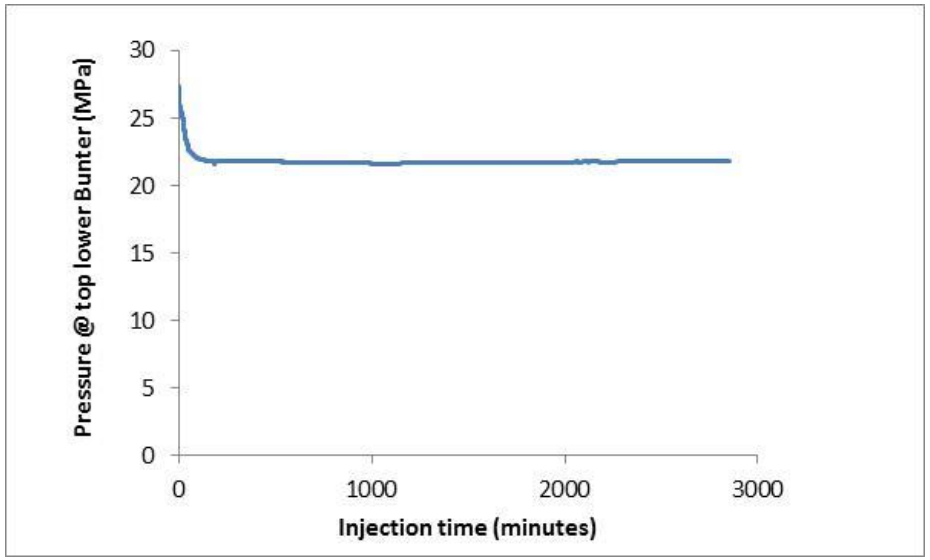
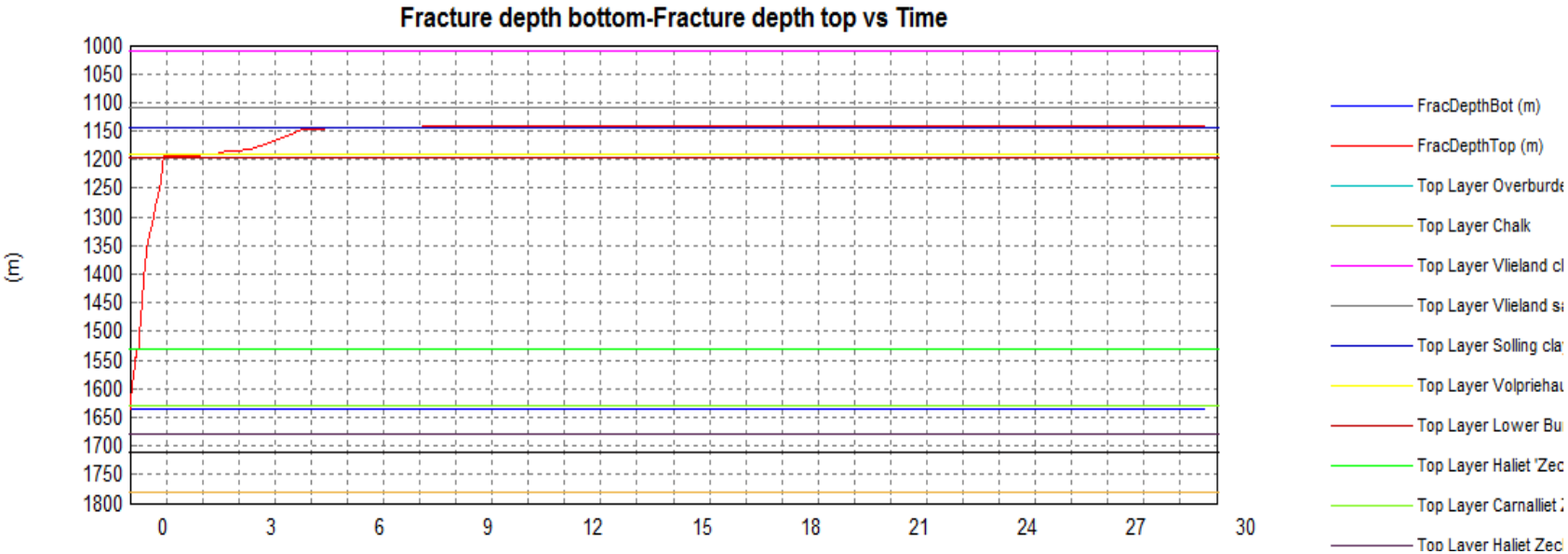
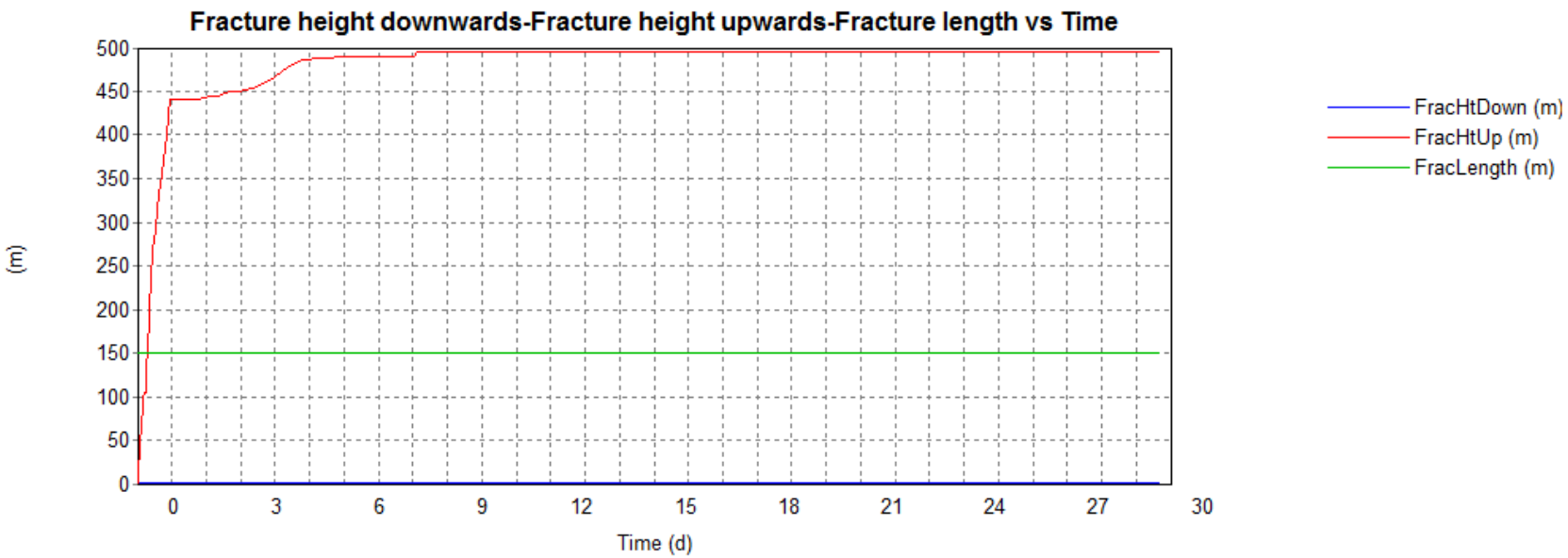




Base case $k_{Vlieland}$ = 300 mD

Third injection cycle @ 2400 m3/d for one month





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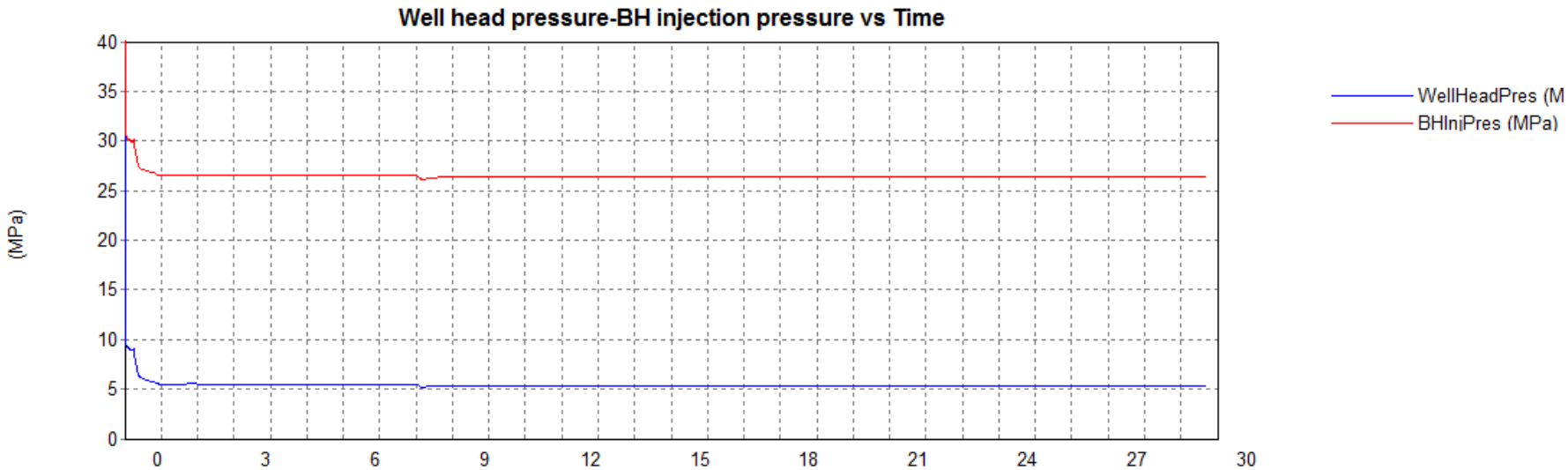

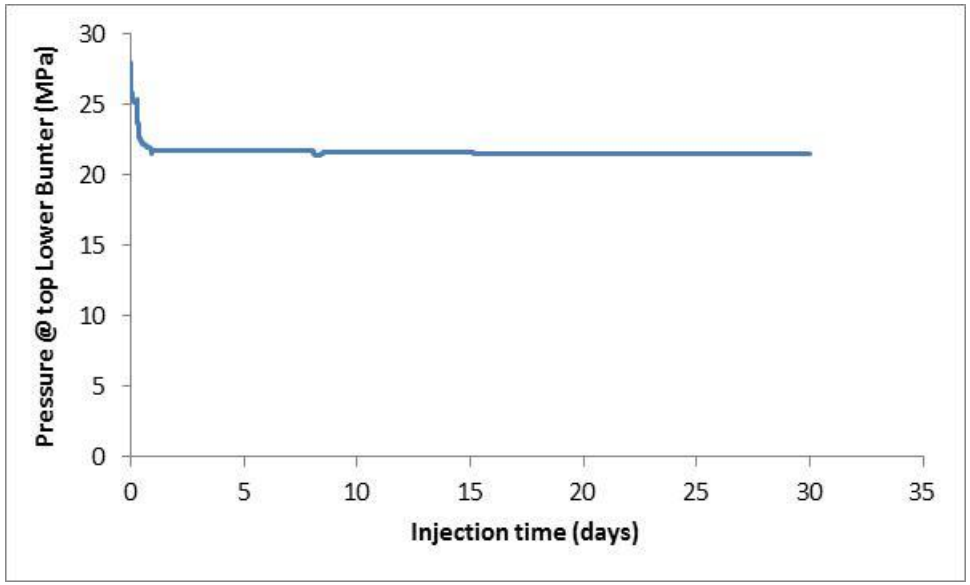

Voorlopige conclusies

- Eenvoudig geologisch model
- Data van Nedmag + schattingen (correlaties, ‘ballpark figures’)
- Waargenomen trends in injectie THP kunnen redelijk gereproduceerd worden
- Fracture (non-)containment hangt essentieel af van de injection rate en de permeabiliteit(en) in de bovenliggende lagen:
  - *Heel hoge injection rate (1e half uur) & lage permeabiliteit: geen containment*
  - *Heel hoge injection rate (1e half uur) & hoge permeabiliteit: wel containment*
- Voor midden-waardes (rond 25000 m3/d) gedurende 2 dagen na het begin en lage waardes (2400 m3/d) van de injection rate is er altijd containment.
- Bovenstaand is kwalitatief in lijn met veldobservaties elders (bijv. Tordis)
- Verklaring: wanneer de injection rate midden tot laag is, is er voldoende weglek-capaciteit in de overburden-lagen en krijgt de fracture niet de ‘kans’ om naar de oppervlakte te groeien
- Wanneer de injection rate (erg) hoog is, kan de geinjecteerde pekel niet snel genoeg weglekken. Je krijgt dan een situatie die je kunt vergelijken met een ondergrondse ‘explosie’ of ‘blow-out’.
- Gebaseerd op de geologische gegevens die nu bekend zijn (globale NW-ZO richting voor de maximum horizontale in-situ spanning), is de verwachting dat de frac groeit in een verticaal vlak in NW-ZO richting.