Innovative use of remote sensing in combination with chemical borehole data results in superior insight in the spread of contaminated sediments

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Waternet

Content

- Introduction on Waternet
- Introduction project
- Methodology
- Results
- Discussions
- Conclusions and recommendations

Waternet: the first water cycle company

City of Amsterdam

- sewerage
- ground water control
- drinking water

Waterboard Amstel, Gooi en Vecht

- surface water quality
- waste water treatment
- water quantity control (dikes)

Waternet: the first watercycle company

- operational/administrative organisation

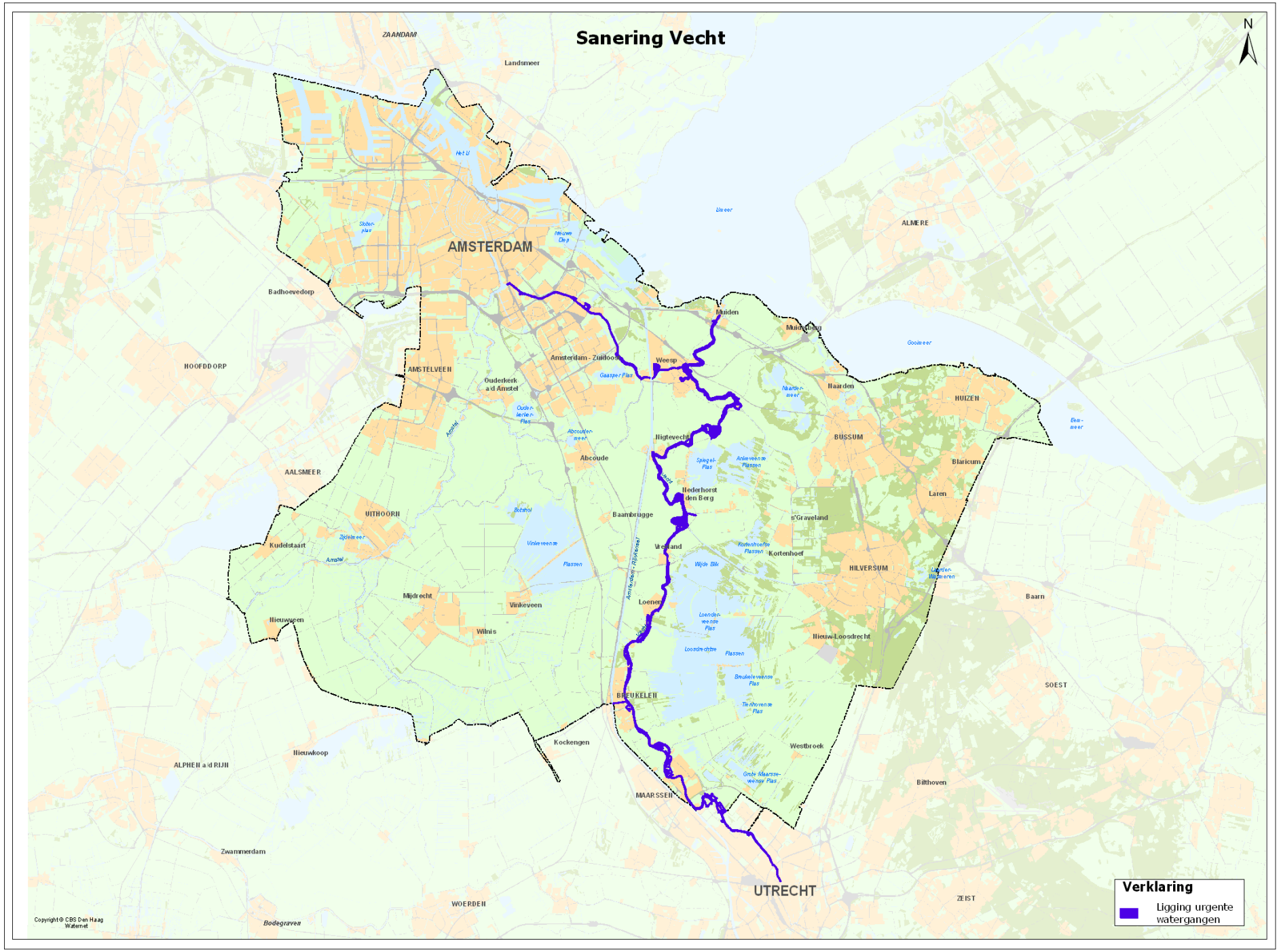
Introdcution project (1)

- Waternet = principle
- Oranjewoud = client (consultant)
- Stema Survey = subcontractor on survey and seismics

Introduction project (2)

River Vecht (42 km long)

- Old branch of river Rhine
- Important trade route to Germany
- Picturesque river
- Tourism
- High ecological target
- Sediments are heavily contaminated


Sanering Vecht
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Landsmeer
AMSTERDAM
Badhoevedorp
HOOFDDORP
AMSTELVEEN
Ouderkerk a/d Amstel
Amsterdam - Zuidoost
Weesp
Muiden
Muidenberg
Naarden
HUIZEN
BUSSUM
Blaricum
Laren
Nigtevecht
Abcoude
AALSMEER
UITHOORN
Kudelstaart
Nederhorst den Berg
Baambrugge
s'Graveland
Kortenhoef
HILVERSUM
Vreeland
Mijdrecht
Vinkeveen
Wilnis
Nieuwveen
Loenen
Nieuw-Loosdrecht
Baarn
SOEST
BREUKELEN
Kockengen
Westbroek
Nieuwkoop
ALPHEN a/d RIJN
MAARSSEN
Bilthoven
Zwammerdam
WOERDEN
UTRECHT
ZEIST
ALMERE
Verklaring
Ligging urgente watergangen
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Methodology (1)

Standard approach

- Based on guidelines
- Chemical borehole data
- base level by interpolation between boreholes

Suitable

- Small lateral variation
- Fairway, shallow lake etc.

Methodology (2)

Approach Vecht

- Contrary to guidelines
- Combination of chemical borehole data and remote sensing

Why

- Morphology of river
- High lateral variation
- Enormous number of boreholes

Methodology (3)

Remote sensing

Top level

↓

Single beam

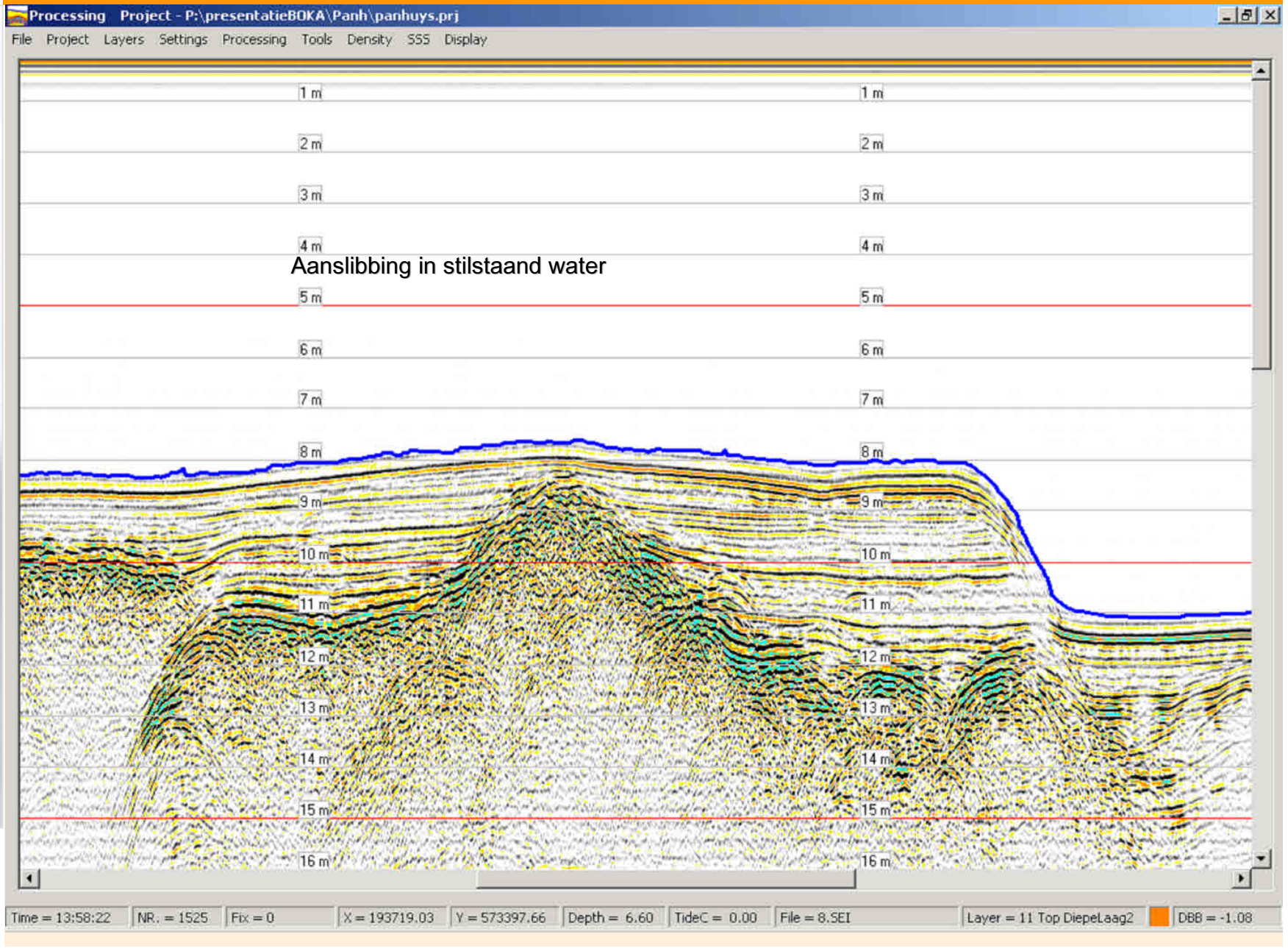
Multibeam

Base level

↓

Radar

Seismics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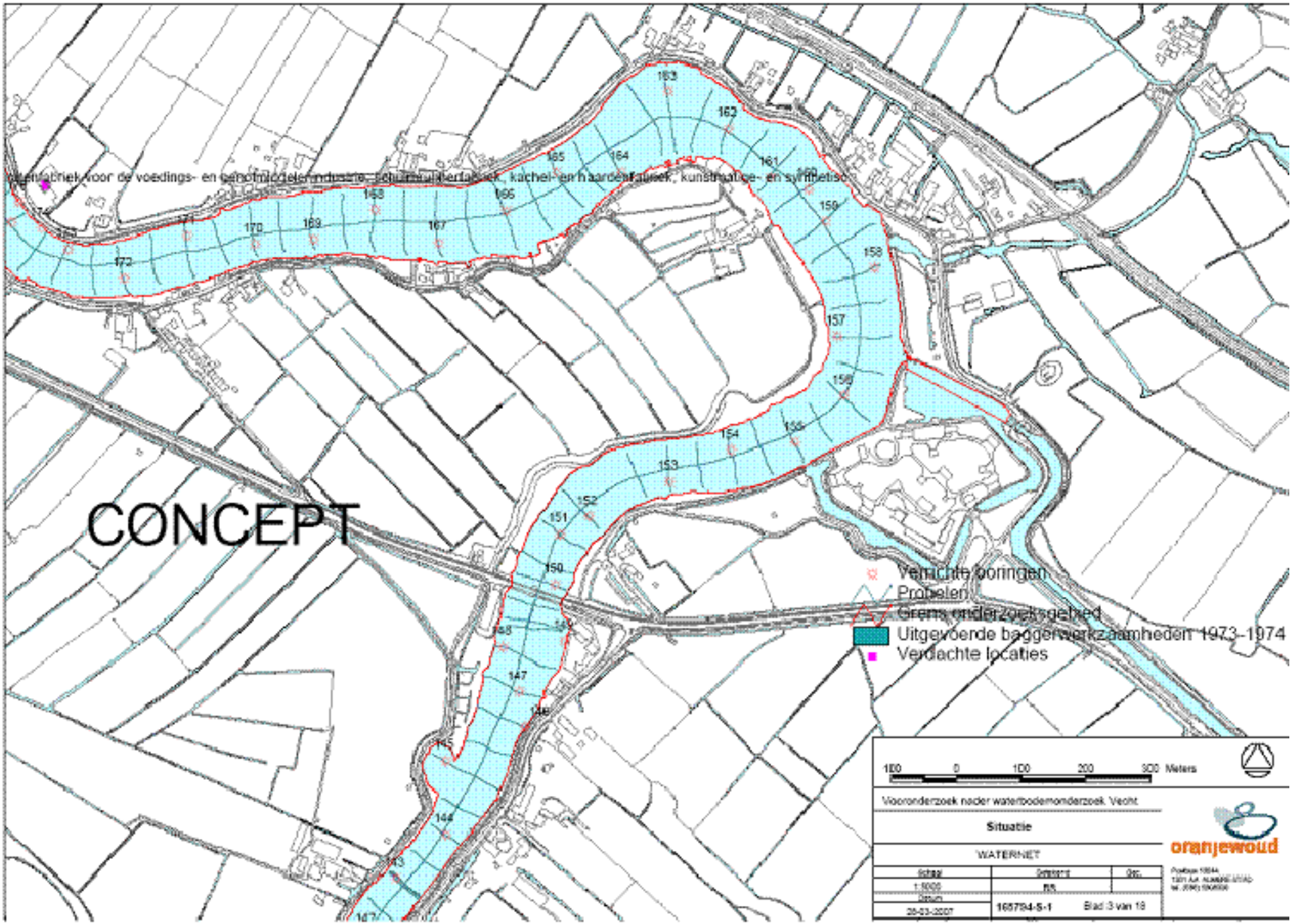
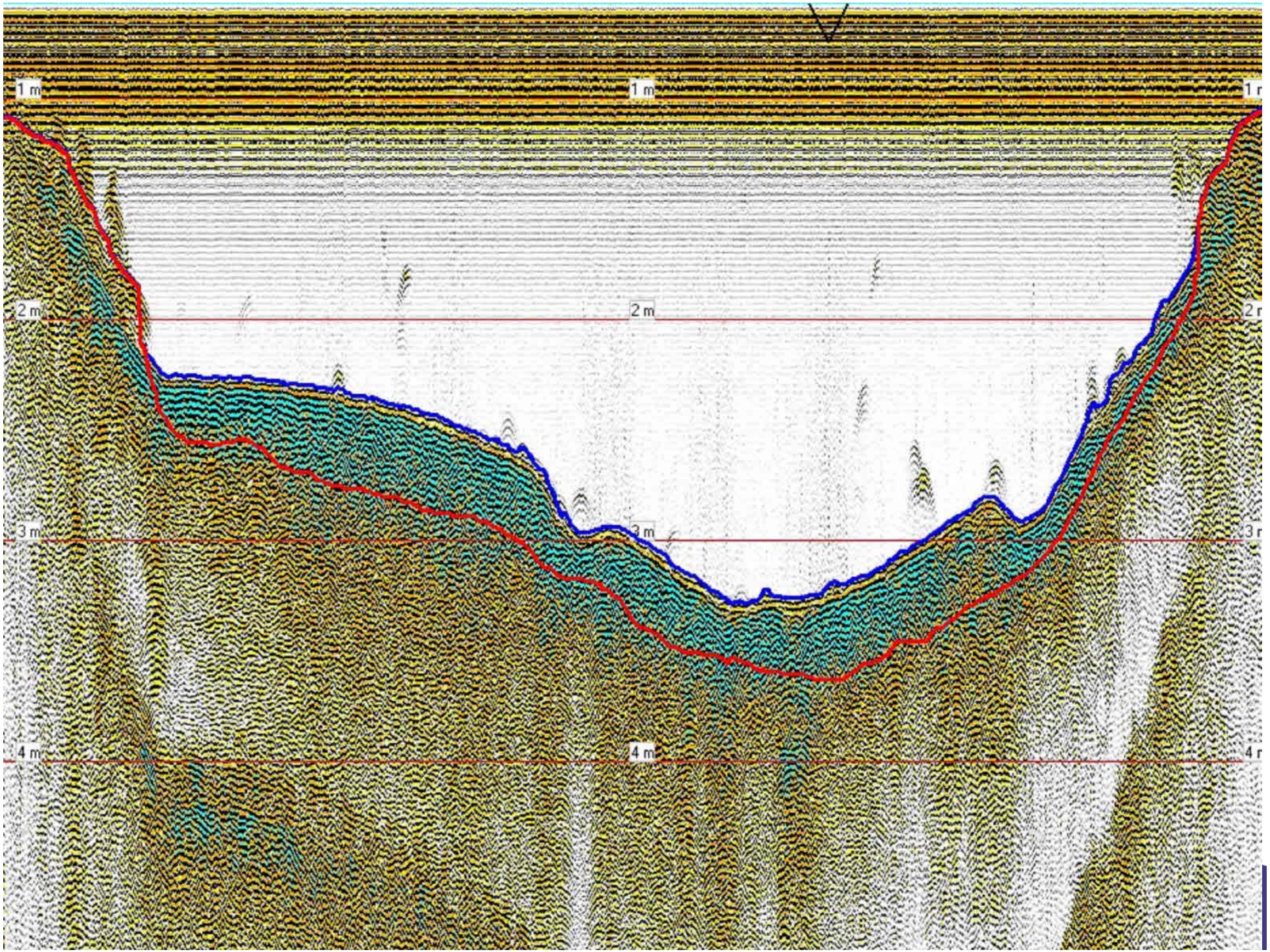

CONCEPT
Verrichte boringen
Profielen
Grens onderzoeksgebied
Uitgevoerde baggerwerkzaamheden 1973-1974
Verdachte locaties
100 0 100 200 300 Meters
Vooronderzoek nader waterbodemonderzoek Vecht
Situatie
WATERNET
oranjewoud
165794-S-1
Blad 3 van 18

Methodology (4)

- Profile data in the cross section (high variation) every 50 m
- Chemical borehole data
- Connect chemical borehole data with profile data
- Make digital terrain model (dtm)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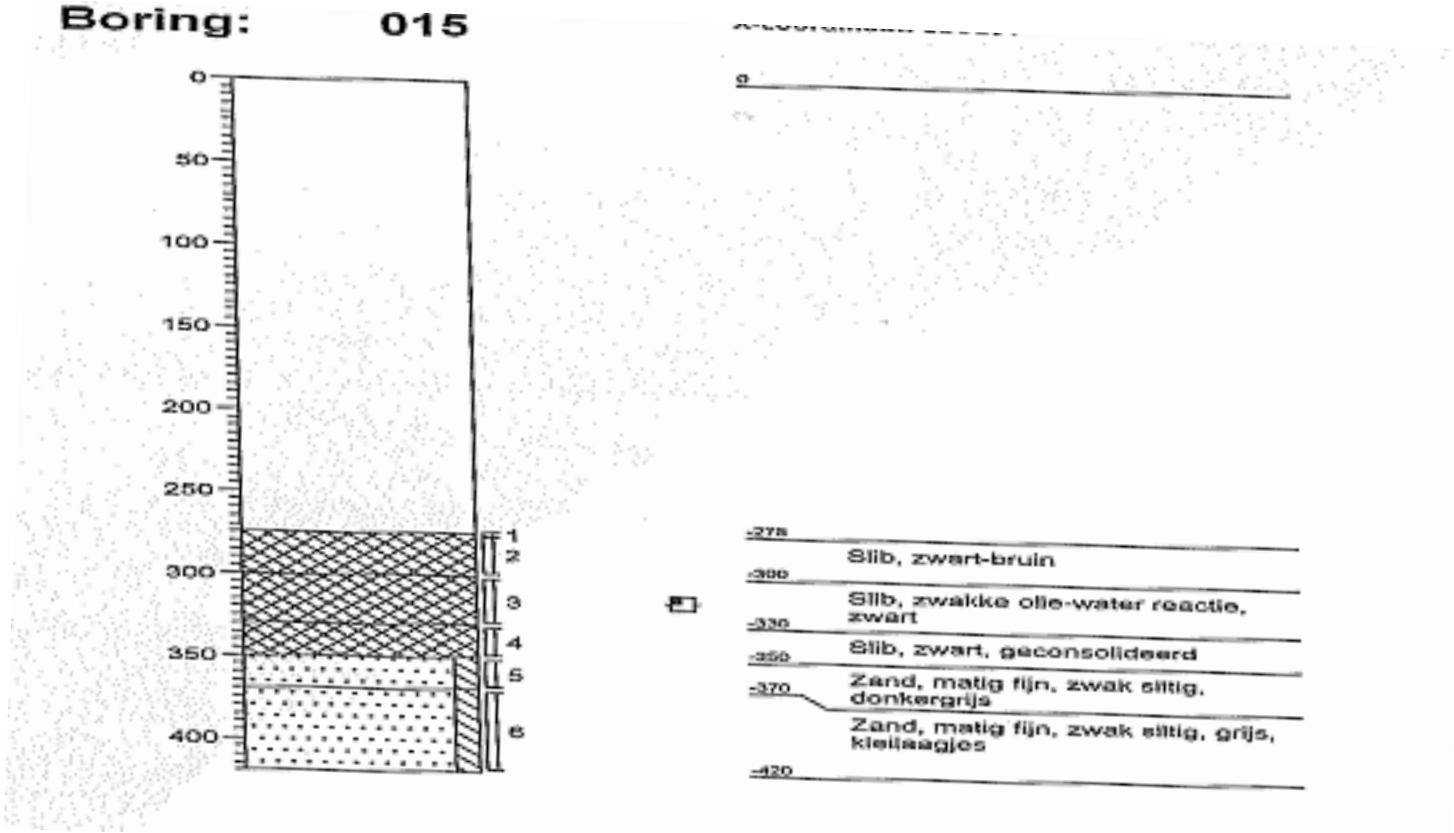
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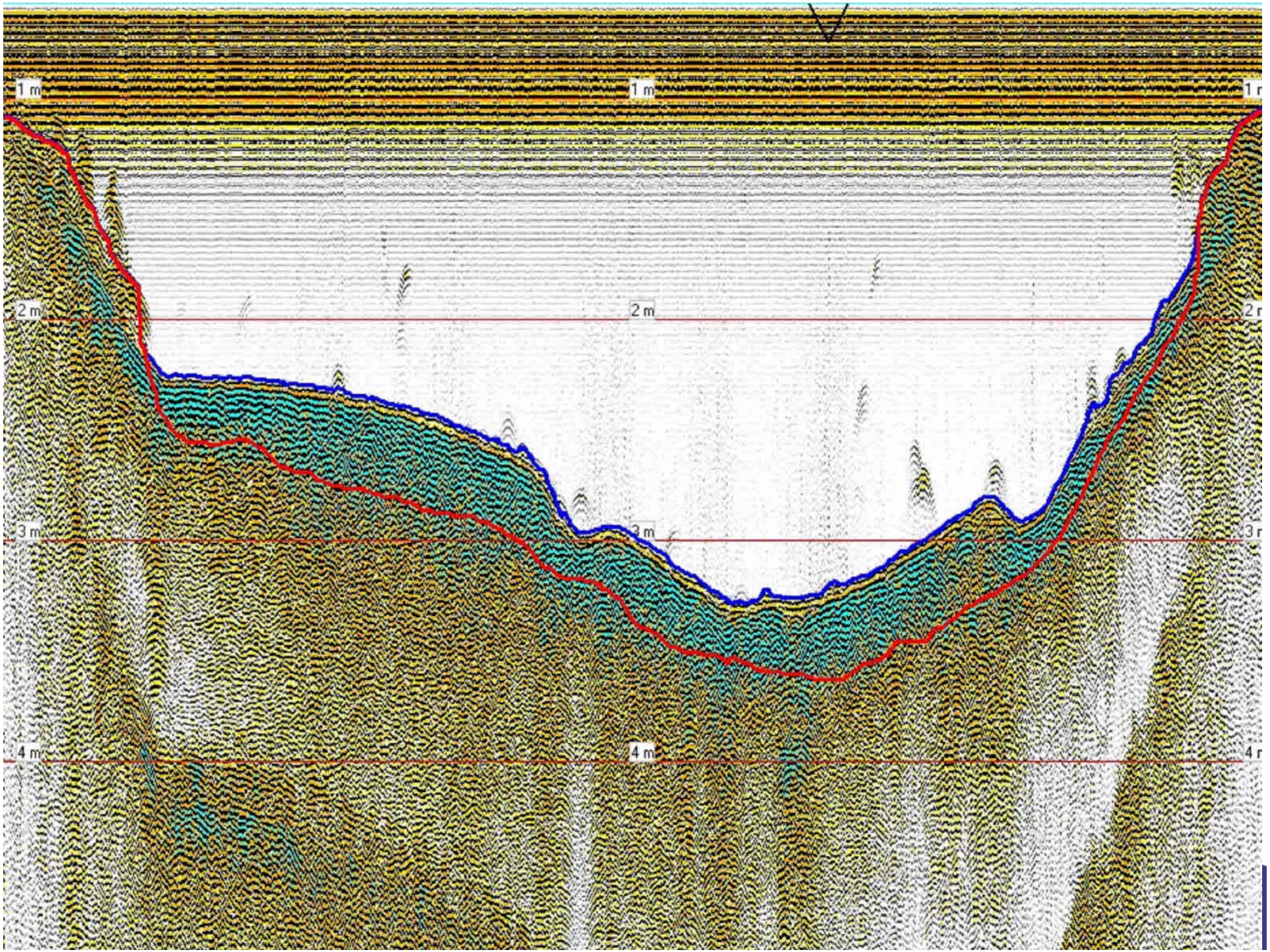
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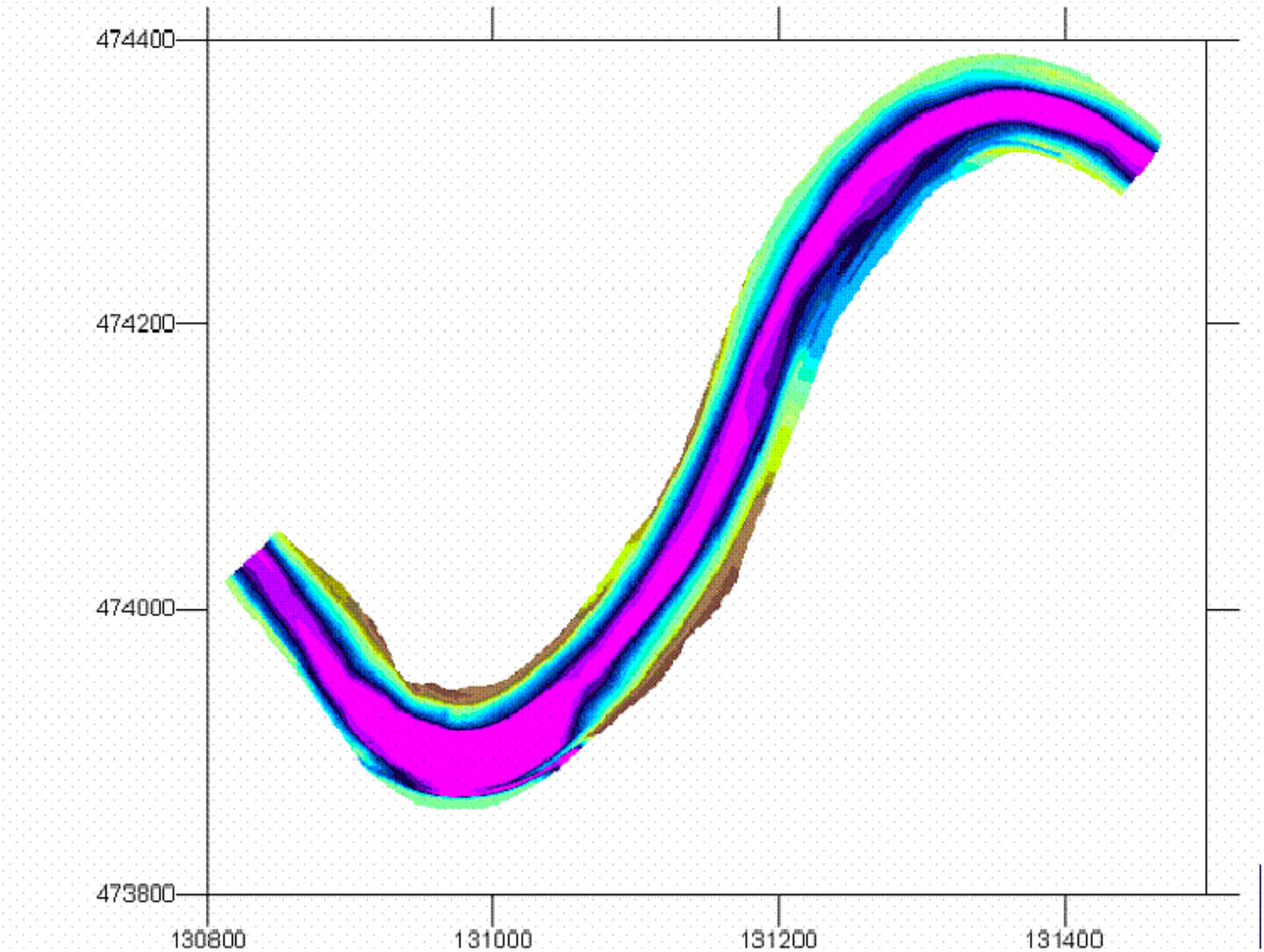
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Discussion

Second opinion

- Validate accuracy

Gas occurances

Conclusions and recommendations

- Improved insight in spread
- 2 mln m^3 (was 1.4 mln m^3)
- Seismics is feasible technique
- Detailed information in direction of the highest variation
- In same time DTM
- Promising technique
- Technique needs to be optimised

THE END