

Nuclear-1 EIA

Stakeholder Workshop
St. Francis Bay 25 May 2010

THYSPUNT GEOHYDROLOGY

PETER ROSEWARNE: SRK CONSULTING



Slide 1

Credentials

- ❖ 35 years of experience-supply, nuclear, mining, waste, subsurface contamination
- ❖ Developed St. Francis wellfields
- ❖ Local work at Coega
- ❖ TMG Aquifer expert
- ❖ EIA specialist studies, eg PBMR



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Project Team

- ❖ SRK Consulting SA
- ❖ SRK Consulting UK
- ❖ Council for Geoscience
- ❖ Institute for Groundwater Studies: UOFS
- ❖ Freshwater Consultants
- ❖ CSIR



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Investigation Approach

- ❖ Data review
- ❖ Site work – hydrocensus; borehole siting; drilling; testing (approx 6 months spent on site, 2.5 years in total, ongoing)
- ❖ Data analysis
- ❖ Numerical flow modelling
- ❖ Reporting
- ❖ Ongoing monitoring



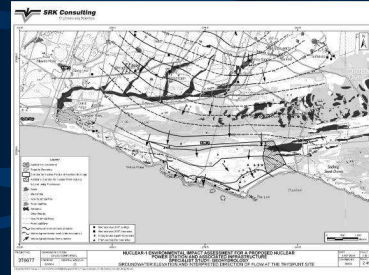
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Site Investigation

- ❖ All bhs/springs within 5 km visited
- ❖ 38 exploration boreholes drilled (plus 78 geotech bhs)
- ❖ 19 Pumping tests carried out
- ❖ Packer tests
- ❖ Tracer test
- ❖ Water sample analyses
- ❖ Monitoring (13 data loggers)



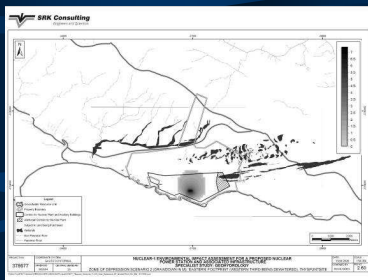
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THYSPUNT
GROUNDWATER LEVEL CONTOURS



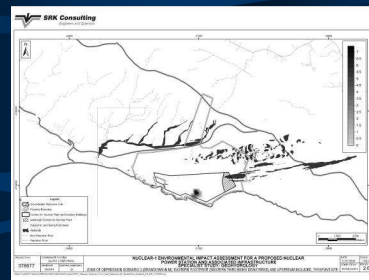
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THYSPUNT
ZONE OF DRAWDOWN FROM DEWATERING: NO MITIGATION



Slide 7



THYSPUNT
ZONE OF DRAWDOWN FROM DEWATERING: WITH MITIGATION



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Key specialist study findings

- ❖ There are 3 aquifers present
- ❖ There is extensive groundwater use in Oyster & St. Francis Bay
- ❖ Groundwater flow is to the south and southeast - site is at end of the flow path
- ❖ There are ecologically important wetlands on the site



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Key specialist study findings

- ❖ Aquifers/wetlands are intimately linked
- ❖ Groundwater levels show minimal fluctuations with time/rainfall
- ❖ Downward trend since monitoring started
- ❖ Construction and operation of Nuclear-1 will require dewatering



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Key specialist study findings

- ❖ Drawdown/contamination will be contained to the site and 1 km of Nuclear-1 with foundation dewatering
- ❖ Drawdown/contamination will be contained to the immediate Nuclear-1 surrounds with groundwater control measures



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Mitigating measures

- ❖ Site system is naturally “buffered” by high porosity sediments; overflow into wetlands; drainage by cobble layer
- ❖ Ongoing monitoring being carried out to further confirm groundwater/wetlands interactions
- ❖ Further numerical flow modelling will be done (fine-tuning – basic findings unlikely to change)



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Mitigating measures

- ❖ Freshwater supply will be from desalination of seawater
- ❖ Construction water could be sourced from dewatering
- ❖ Cut-off barriers to contain dewatering
- ❖ Artificial recharge to maintain coastal seeps/springs
- ❖ Further design work before construction



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THANK YOU



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