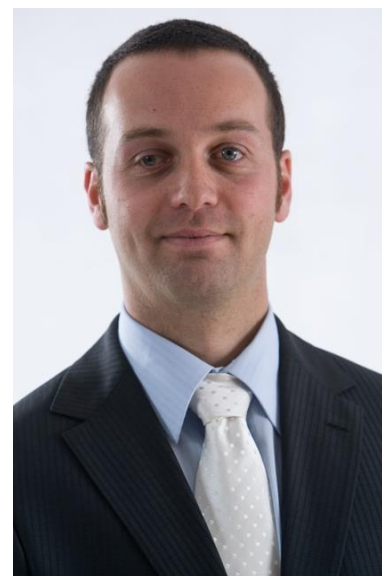


# Anthony John Barthelmess

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## Qualifications

- Diploma of Structural Engineering, 2000 (SIT, Ultimo).
- Masters of Civil Engineering, 2009 (University of Wollongong).
- Statutory Underground Coal Ventilation Officers Certificate of Competency for NSW and QLD (UNSW).
- Chartered Professional Engineer (Civil), National Engineers Register (NER), Registered Professional Engineer Queensland (RPEQ).
- *Committees & Memberships:* Member Institute of Engineers Australia, Australian Rainfall & Runoff Project 11 Blockage Committee, Vice-President of ACEC.
- *Professional Activities:* Co-author of the WBNM hydrologic software model, guest Lecturer at UOW.
- Recipient of several NSW and National industry awards for Excellence in Stormwater Management.



## Experience

- |                       |   |
|-----------------------|---|
| <b>2015 – Current</b> | <b>Managing Director – Rienco Consulting.</b><br>Managing Director of a regional consulting water and civil engineering firm, specialising in hydrology and hydraulics.   |
| <b>2012 – 2015</b>    | <b>Gas &amp; Ventilation Engineer, BHP Billiton / South32 / Appin Mine</b><br>Responsible for management of underground ventilation and surface gas drainage activities at Appin Mine and managing the ~\$6M annual capital works program. Appointed Statutory Ventilation Officer at Appin Mine. |
| <b>2009 – 2011</b>    | <b>Project Director – Cardno NSW Pty Ltd</b><br>Responsible for leading a large team of employees and sub-consultants to deliver major Part 3A projects across NSW.   |
| <b>2006 – 2009</b>    | <b>Project Engineer – Cardno Forbes Rigby Pty Ltd</b><br>Lead flood and water modeller supporting large scale urban development and civil infrastructure projects.  |
| <b>2002 – 2005</b>    | <b>Civil Designer – Forbes Rigby Pty Ltd</b><br>Civil designer on a range of civil engineering projects, involving all facets of project delivery from concept design through to site supervision and contract admin.   |
| <b>2000 – 2001</b>    | <b>Project Engineer – GHD Pty Ltd</b><br>Role involved preparation of civil design plans and specifications for large design and construction contracts and large scale civil infrastructure.   |
| <b>1996 – 2000</b>    | <b>Project / Construction Engineer – MPN Group Pty Ltd</b><br>Prepared civil designs for multiple Westfield Shopping Centre external works. Role also involved extensive site supervision across Australia.   |

## Summary of Expert Witness and Conciliation Experience

- Class 1 Land & Environment Court Proceedings [2023] NSWLEC 1074 (Powerex Group Pty Ltd v Wingecarribee Shire Council). Acted for the applicant relating to flood and stormwater issues on a proposed 22 lot residential development in Moss Vale, NSW. The flood and stormwater related issues were resolved successfully for the applicant via a S34 agreement.
- Class 1 Land & Environment Court Proceedings [2023] NSWLEC 1071 (Long v Wingecarribee Shire Council). Acted for the applicant relating to flood issues on a proposed residential development in Wildes Meadow, NSW. The flood related issues were resolved successfully for the applicant via a S34 agreement.
- Class 1 Land & Environment Court Proceedings [2023] NSWLEC 1046 (Windang Kruger Resorts Pty Ltd ATF Windang Kruger Resorts Unit Trust v Wollongong City Council). Acted for the applicant relating to flood and stormwater matters on a proposed contaminated site remediation in Windang, NSW. The flood and stormwater related issues were resolved successfully for the applicant via evidence provided at the hearing.
- Class 1 Land & Environment Court Proceedings [2023] NSWLEC 1030 (R and G Creations Pty Ltd v Shoalhaven City Council). Acted for the applicant relating to stormwater issues on a proposed residential development in Mollymook, NSW. The stormwater related issues were resolved successfully for the applicant at the S34 conference via a S34 agreement.
- Class 1 Land & Environment Court Proceedings [2022] NSWLEC 1569 (Thirroul Plaza Pty Ltd v Wollongong City Council). Acted for the applicant relating to flood and stormwater issues on a proposed mixed use development in Thirroul, NSW. The flood and stormwater related issues were resolved successfully for the applicant at the S34 conference via a S34 agreement.
- Class 1 Land & Environment Court Proceedings [2022] NSWLEC 1483 (Akbari v Wollongong City Council). Acted for the applicant relating to stormwater issues on a residential property in Wombarra, NSW. The stormwater related issues were resolved at the S34 conference.
- NSW Supreme Court Proceedings 2021/00045593 Stephen Crouch ats Wingecarribee Shire Council. Acted for Wingecarribee Shire Council in providing an expert report on flooding and stormwater in proceedings relating to concentration of flow, and an increase in the natural flow of water over land.
- Class 1 Land & Environment Court Proceedings [2021] NSWLEC 1342 (Mata Mati Pty Ltd v Wollongong City Council). Acted for the applicant relating to flood and stormwater issues on a proposed residential development in Thirroul, NSW. The flood and stormwater related issues were resolved successfully for the applicant via evidence provided at the hearing.
- Class 1 Land & Environment Court Proceedings [2021] NSWLEC 1305 (The Artists Outlook Pty Ltd v Wollongong City Council). Acted for the applicant relating to flood issues on a proposed commercial development in Thirroul, NSW. The flood and related issues were resolved successfully for the applicant at the S34 conference/S34 agreement.
- Class 1 Land & Environment Court Proceedings [2021] NSWLEC 1284 (Sorace Constructions Pty Ltd v Wollongong City Council). Acted for the applicant relating to flood and stormwater related issues on a proposed residential subdivision in Wollongong. The flood and stormwater related issues were resolved successfully for the applicant at the S34 conference/S34 agreement.
- Class 1 Land & Environment Court Proceedings [2021] NSWLEC 1362 (Allen Price & Scarratts Pty Ltd v Shoalhaven City Council). Acted for the applicant relating on flooding and water quality related matters for a large development on residentially zoned land in

Worrigeer, NSW. All flooding and water quality related matters were resolved in favour of the applicant via evidence provided at the hearing.

- Class 1 Land & Environment Court Proceedings [2021] NSWLEC 1129 (Wombarra Vista Pty Ltd vs Wollongong City Council). Acted for the applicant relating to flood and stormwater related issues on a proposed residential subdivision in Wollongong's northern suburbs. The flood and stormwater related issues were resolved successfully for the applicant at the S34 conference.
- NSW Supreme Court Proceedings 2020/00242173 Terry Hazeltine ats Wingecarribee Shire Council. Acted for Wingecarribee Shire Council in providing an expert report on flooding and stormwater in proceedings relating to a motorcycle accident allegedly located in a drainage channel.
- Class 1 Land & Environment Court Proceedings [2020] NSWLEC 1622 (Lake Illawarra Park Pty Ltd v Wollongong City Council). Acted for the applicant relating to flood and coastal hazard related matters for a caravan park and permanent home development in Windang. Flood and coastal hazard related matters were successfully resolved for the applicant during the S34 conciliation.
- Class 1 Land & Environment Court Proceedings [2020] NSWLEC 1446 (Jetz Luxury Homes Pty Ltd vs Inner West Council). Acted for the applicant relating to flood related issued on a change of use, from a commercial unit to a residential unit.
- Class 1 Land & Environment Court Proceedings [2019] NSWLEC 1312 (RBFi Pty Ltd vs Wollongong City Council). Acted for the applicant relating to flood modelling and the use of Australian Rainfall & Runoff (2019) where the Council was mandating the use of the superseded Australian Rainfall & Runoff (1987). Flood related matters were successfully resolved for the applicant via evidence provided at the hearing.
- Class 1 Land & Environment Court Proceedings 2018/389150 (Goodfellow vs Wollongong City Council). Acted for the applicant relating to flooding matters for portions of fill placed without development consent on the floodplain. The matter was resolved at the S34 conference.
- Class 1 Land & Environment Court Proceedings [2018] NSWLEC 1074 (Blasi vs Wollongong City Council). Acted for the applicant relating on flood related matters for a development on residentially zoned land in Balgownie, NSW. Flood related matters were successfully resolved for the applicant.
- Class 1 Land & Environment Court Proceedings [2016] NSWLEC 1527 (Fetherston vs Wollongong City Council). Acted for the applicant relating on flood and coastal hazard related matters for a development on residentially zoned land in Stanwell Park, NSW. Flood and coastal hazard related matters were successfully resolved for the applicant in a difficult 'joinder' arrangement where an adjoining landowner was also involved alongside WCC.
- Class 1 Land & Environment Court Proceedings [2016] NSWLEC 1042 (Hughes vs Wollongong City Council). Acted for the applicant relating on flood related matters for a 5-unit development on residentially zoned land in Coledale, NSW. Flood related matters were successfully resolved for the applicant at the Section 34 conference.
- Class 1 Land & Environment Court Proceedings [2007] NSWLEC 526 and NSWLEC 234 (Neate vs Shellharbour Council). This project involved the creation of 1D and 2D flood models for confirmation of flood behaviour in support of a development application for a Seniors Living complex in 2006. The client then litigated in the L&E Court (for which Expert Witness services were rendered) to obtain a DA, which was successful in 2007.
- Class 1 Land & Environment Court Proceedings [2006] NSWLEC 164 (Neate vs Wollongong City Council). This project involved creation of 1D and 2D flood models in support of a development application for a Seniors Living complex. The client litigated in the Court (for which Expert Witness services were rendered) to obtain a DA, which was successful, pending the development of a Flood Warning System (FWS). A FWS was developed, but again litigation was considered the only way of furthering the Development

Consent. This further phase involved the additional Expert Witness Statements and participation in Joint Expert Witness Conferences with Council and the SES and attendance in Court.

- Class 1 Land & Environment Court Proceedings (Wakim vs RTA). This project involved compensation of supposed flood affected land up for Compulsory Acquisition by the RTA. The work involved determining the 'highest and best use' of the land with regard to its flood affectation. Acting for Mr. Wakim, the matter was resolved successfully.
- JRPP and Planning Panel Appearances. Various appearances at Joint Regional Planning Panel and Planning & Assessment Commission to provide evidence /submissions for Major Part 3A land development projects (relating to flooding).

## Summary of Hydrology and Hydraulics Experience

- Hewitts Creek Flood Study and Floodplain Risk Management Study for Wollongong City Council (2002).
- Duck Creek Flood Study for Tallawarra Lands/TRUenergy. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS and TUFLOW) model of Duck Creek with a complicated arrangement of flood storages and diversions.
- Calderwood Flood Study for Delfin Lend Lease. Catchment wide hydrology (WBNM) and hydraulic (TUFLOW) model of Macquarie Rivulet, calibration and validation, and development of a FPRMS for a 4,500 lot land release area.
- Vincentia Flood Study for Stockland Developments. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS) model of a sensitive Vincentia catchment discharging into St Georges Basin.
- Forde Estate Flood Study, Canberra for Canberra Investment Corporation. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS) model of for a catchment with ~650 lots proposed.
- Central Hills Rezone for Camden Council. Catchment wide hydrology (WBNM) and hydraulic (HEC-RAS) modelling of an open pasture catchment at Narellan, for proposed 1,000 lots.
- Bulli Dam Investigation for Multiplex. Hydrologic investigation into various over-topping scenarios up to the PMF.
- Flood Study for Proposed Woolworths Supermarket, Princes Highway Bulli. Prepared flood study including detailed site inspections of diversions structures, full hydrologic study including detention basins, blockage scenarios and diversions (WBNM). The area is quite complex due to diversions at each hydraulic structure combined with the Illawarra Railway line acting as a large weir immediately downstream of the site. Study also required detailed hydraulic model and determination of flood risk precincts to Councils DCP54.
- Mt Ousley Bulli Pass Upgrade Study, Wollongong for RTA. Project involved GPS survey using differential GPS and handheld unity on existing culverts for Main Road 95 and 513 (Mt Ousley Road and Bulli Pass) using GIS based field method. Undertake hydrologic (WBNM) and hydraulic (HEC-RAS) calculations based on field captured data and hydrologic/hydraulic analysis.
- Drainage Study of Marrickville Industrial Estate for Marrickville Council. Responsible for modelling and documentation of over 1,500 stormwater pits and pipes, detention basins, open channels and weirs. Assistant Modeller using DRAINS for Marrickville City Council simulating complex flow diversions and flow paths.
- Macquarie Rivulet Flood Studies (various). Several hydraulic models (HEC-RAS and FESWMS) of Macquarie Rivulet lower flood plain to determine previously unknown effects of the PMF event on future development. Preparing flood reports and compliance with

the many varying requirements in place in the Illawarra (local DCP's, FDM2005, FMM 2001 etc).

- Review of Lake Illawarra Flood Study and Floodplain Risk Management Study. Review and provide comment to Lake Illawarra Authority on the impacts and technical points of conflict in the Lake Illawarra Flood Study and Risk Management Plan. With respect to appropriate freeboard, the effects of filling around the lakes, entrance conditions etc.

## Summary of Water Quality and WSUD Experience

- Water Sensitive Urban Design Study, Worrigee Road Subdivision (2019). Lead author of the Water Sensitive Urban Design Study of the Environmental Assessment for the Worrigee Road subdivision, a 150 lot rural-residential development near Nowra. Involved protracted negotiations with Council and a Class 1 Land & Environment Court hearing.
- Water Sensitive Urban Design Study, Calderwood Urban Development Project (2010). Lead author of the Water Sensitive Urban Design Study of the Environmental Assessment for the Calderwood Urban Development Project. Involved protracted negotiations with DoP, the PAC and peer review processes to ensure the successful Project Application.
- Water Sensitive Urban Design Study, Bayswood Development, Vincentia (2007). Lead author of the Water Sensitive Urban Design component of the Environmental Assessment for the Bayswood Development (State Significant Major Project). The major project application was successful and additional reporting was required to assess the Director General Requirements and prepare the Project Application. Detailed designs were then prepared and the wetland and environmental protection measures began construction late 2007.
- Water Sensitive Urban Design Study, Sandon Point Development (2007). Lead author of the Water Sensitive Urban Design component of the Environmental Assessment for the Sandon Point development (State Significant Major Project). A detailed Climate Change assessment on increased flood risk and coastal erosion was also undertaken. Involved protracted negotiations with DoP and peer review processes to ensure the successful Project Application.
- Forde Estate Wetland Concept Design, ACT (for Canberra Investment Corporation CIC, 2006). Lead designer of over 4 ha of wetlands and ponds for a new residential estate near Gungahlin in ACT. The wetlands are capable of treating over 400 ha of cleared and developed catchment to below existing nutrient levels. Detailed WBNM, HEC-RAS and MUSIC modelling was required to afford the development team a certain level of confidence regarding the approach taken by the design.
- Central Hills Rezone – Water Cycle WSUD Study for Camden Council (2005-06). This study was prepared in support of a rezone of agricultural land to urban release. The study contained a detailed water cycle analysis (including preparation of detailed water balance models) and a full assessment of water quality and WQM objectives. Also of note was the heritage water supply canal structures traversing the site, and the ever present salinity problem in western Sydney.

## Project Management and Superintendent Experience

- Nan Tien Temple / University (Wollongong). Site Superintendent and Contract Preparation and Administration for the ground consolidation and civil works (Contract value = ~\$6M).

- Tullimbar Subdivision (Wollongong). Site Superintendent and Contract Preparation and Administration for a 2km riparian area and first two residential stages ~100 lots (Contract value = \$10M).
- Haywards Bay Subdivision (Wollongong). Site Supervision of several 40 lot stages of the subdivision and two RTA bridges.
- Stockyard Creek Subdivision (Wollongong). Site Superintendent and Contract Administration for a riparian area 65 lot residential stage (Contract value = \$1.5M).
- Various University of Wollongong Infrastructure. Site supervision and Contract Preparation and Administration for 250 space carpark and extensions to Building 40 (\$5M).
- Westfield Warrawong (NSW), Westfield Hornsby (NSW), Westfield Southlands (VIC) and Westfield Tea Tree (SA). Supervision and Contract Administration for all external works such as alterations and additions to existing roads, carparks, external roundabouts, stormwater drainage and pavement reports and rehabilitation.

## Urban Development and Civil Engineering Experience

- Lead Designer and Site Superintendent – Stockyard Creek Subdivision, Albion Park. Role involved the design of over 120 lots in three stages, trunk infrastructure, riparian areas and RTA road upgrades.
- Lead Designer and Site Superintendent – Nan Tien Temple. Role involved the design of the remediation of an old landfill to enable the new University to be constructed. This project utilized ~500,000 m<sup>3</sup> of coalwash emplacement.
- Lead Designer and Site Superintendent – Tullimbar Village. Role involved the design of over 1,500 lots, trunk infrastructure, 2km of riparian areas and RTA road upgrades.
- Lead Designer and Site Supervision – Hayward's Bay Subdivision, Albion Park. Role involved the design of over 450 lots in eight stages, trunk infrastructure (including vacuum sewer) and RTA road access including two bridges. This project involved over 800,000 m<sup>3</sup> of coalwash emplacement.
- Energy Australia 132kV Cable Cross-City Tunnel. Responsible for design, documentation and design/construct contract preparation of 1.3km cross city tunnel and portals.
- Somerton Power Station. Responsible for design and documentation of a complex road network and services arrangement at Somerton Power Station.

## Summary of Mining Experience

- Statutory Appointed Ventilation Officer at Appin Mine. Completion of all statutory responsibilities, monthly ventilation surveys, P/Q surveys with electronic barometers, financial planning and reporting.
- Surface Gas Drainage – Design, construction and operation of gas boreholes, gas drainage plants and monitoring infrastructure.
- Stage 3 Coalwash Emplacement Project, West Cliff Colliery. This project involved the engineering design and construction supervision of \$33M of construction works to support the ongoing stages of Illawarra Coal's Stage 3 emplacement. The project involved construction liaison with the Contractor and in excess of 200,000 m<sup>3</sup> of earthworks, two 45ML dams and 7 km of surface water diversion drains.
- Dendrobium Drift (North-West Mains, B Heading 12-20ct) Pavement Design Inbye of Wongawilli Seam fault (500m length).

- Appin Area 7 Longwall 704 2km sub-surface MRD drill and well-head extraction design and Goaf Gas Extraction Plant Detailed Design.
- Appin Area 9 Vent Shaft 6 Drilling Site Layouts, and Appin Area 9 Tailgate 901 STIS 2.2km drill hole and drill pad designs.
- Mine Closure Plans and Cost Estimates for Cordeaux, Dendrobium and Processing/Logistics sites.

## Publications

Barthelmess, A.J., Rigby, E.H. and Kelly, A.D. 2022. *Assessment of Development Related Impacts on Design Flood Behaviour*. Proceedings of Australian Hydrology and Water Resources Symposium, 2022. SBN 978-1-925627-64-0.

Rigby, E.H. and Barthelmess, A.J. 2022. *Hydrologic Modelling as a Pre-Processor for ARR19 Design Flood Modelling*. Proceedings of Australian Hydrology and Water Resources Symposium, 2022. ISBN 978-1-925627-64-0.

Boyd M., Rigby E. and Barthelmess A., 2022. *WBNM Theory*. Hydrologic model theory manual available from [www.wbnm.com.au](http://www.wbnm.com.au).

Boyd M., Rigby E. and Barthelmess A., 2022. *WBNM Runfile*. Hydrologic model runfile manual available from [www.wbnm.com.au](http://www.wbnm.com.au).

Boyd M., Rigby E. and Barthelmess A., 2022. *WBNM User Guide*. Hydrologic model user guide manual available from [www.wbnm.com.au](http://www.wbnm.com.au).

Barthelmess, A.J. and Rigby, E.H. 2021. *An Investigation Into the Impact of Subareal Shape on Hydrologic Model Discharges*. Proceedings of Australian Hydrology and Water Resources Symposium, Digital Water 2021.

Rigby, E.H, Barthelmess, A.J., Mazengarb, C. and Garcia, R. 2016. *“Experiences Exploring the Feasibility of Constructing a Very Large Scale 2D Flood Model of Tasmania”*. Proceedings of 37<sup>th</sup> Australian Hydrology and Water Resources Symposium, Queenstown, New Zealand.

Barthelmess, A.J. and Nichols, P.S. 2015. *“Suitability of ARR Guidelines as an Alternative Blockage Policy for Wollongong”*. Proceedings of 36<sup>th</sup> Australian Hydrology and Water Resources Symposium, Hobart, Tasmania.

Weeks, W, Barthelmess, A.J, Rigby, E.H, Witheridge, G and O’Loughlin, G. 2013. *“Blockage of Hydraulic Structures – Stage 2 Report”*. ISBN 978-0-85825-956-0, Prepared for Engineers Australia for Australian Rainfall and Runoff revisions.

McIntosh, G.W. and Barthelmess, A.J. 2013. *“Building on an old landfill: design and construction”*. Proceedings 18<sup>th</sup> Int. Conf. on Soil Mechanics and Geotechnical Engineering, Paris.

McIntosh, G.W. and Barthelmess, A.J. 2012. *“Reclamation of an old landfill at Unanderra, NSW”*. Proceedings Int. Conf. on Ground Improvement and Ground Control, Wollongong, Australia October 2012. (Invited Paper).

Barthelmess, A.J. and De Jong, O. 2011. *“When are Impacts on Flooding Non-Detrimental? Implications of Development in Flood-Prone Sites”*. Proceedings of NSW SIA Conference, Hunter Valley, September 2011.

De Jong, O. and Barthelmess, A.J. 2011. *“Major Flood of March 2011: 1 in 100 year Wipeout for Warilla”*. Proceedings of NSW SIA Conference, Hunter Valley, September 2011.

Barthelmess, A.J. and Rigby, E.H. 2011. "*Estimating Culvert Blockages – A simplified Procedure*". 34<sup>th</sup> World Congress of the International Association for Hydro-Environment Engineering and Research (IAHR) 26 June – 1 July, 2011.

Rigby, E.H. and Barthelmess, A.J. 2011. "*Culvert Blockage Mechanisms and their Impact on Flood Behaviour*". 34<sup>th</sup> World Congress of the International Association for Hydro-Environment Engineering and Research (IAHR) 26 June – 1 July, 2011.

Barthelmess, A.J. and Nichols, P.S. 2010. "*The Development of a Predictive Flood Warning System to Manage Flood Isolation Risk for Lake Illawarra*". Proceedings of 50<sup>th</sup> Annual Floodplain Managers Conference, Gosford 2010.

Barthelmess, A.J. and Rigby, E.H. 2009. "*Quantification of Debris Potential and Evolution of a Regional Culvert Blockage Model*". Proceedings of H2009 - 32nd Hydrology and Water Resources Symposium, Newcastle NSW, November.

Weeks, W, Barthelmess, A.J, Rigby, E.H, Witheridge, G and Adamson, R. 2009. "*Blockage in Drainage Structures*". Proceedings of Hydrology and Water Resources Symposium, Engineers Australia, Newcastle.

Nichols, P.S., Barthelmess, A.J. and Webber, K. 2008. "*Merit-based Design in Floodplain Management*". Proceedings of 48<sup>th</sup> Annual Floodplain Managers Conference, Wollongong 2008.

Weeks, W, Barthelmess, A.J, Rigby, E.H, Witheridge, G and O'Loughlin, G. 2009. "*Blockage of Hydraulic Structures – Stage 1 Report*". ISBN 978-085825-9539, Prepared for Engineers Australia for Australian Rainfall and Runoff revisions.

Barthelmess, A.J. 2007. "*Geomorphology and Urban Stream Rehabilitation: Principles in Practice*". Proceedings of Stormwater Industry Association National Conference, Wollongong 2007.

Barthelmess, A.J. 2007. "*Using GIS to prioritise culvert upgrade*". Proceedings of Stormwater Industry Association National Conference, Wollongong 2007.

Barthelmess, A.J. and Nichols, P.S. 2006. "*A Framework for Culvert Upgrade and Assessment in GIS: An Engineers Approach*". Proceedings of 1<sup>st</sup> OZRI – National GIS Conference Melbourne 2006.