

## MARK URLWIN COLEMAN



PO Box 176  
Darlington  
Western Australia 6070  
Mobile 0418 959 932  
☎ 61 8 92521050  
📠 61 8 92521051  
Mark@actis.com.au  
www.actis.com.au

### Member

Environmental Consultants Association  
International Society for Salt Lake Research (symposium committee member)  
American Benthic Society

### Education

**Master of Environmental Studies**, University of Tasmania 1988  
**Grad Dip in Management (Information Sys)**, CQ University 1995  
**Bachelor of Science (Zoology, Physiology)**, University of WA 1979

### Details

Born 17th December 1957, Perth WA  
Australian Citizen

### Interests

I have experience in many aspects of Environmental Management and am familiar with environmental and mining legislation in several Australian States. I have undertaken several projects in Vietnam and Timor. My particular areas of interest are listed below:

Environmental impact evaluations and surveys  
Evaluation of saline lakes  
Solar salt field design, technical and production solutions  
Saline land rehabilitation  
Water chemistry and nutrient recycling  
Waste water management and pollution control  
Anaerobic/sediment ecosystems and their impact on algal blooms

I am also a third partner of a salt harvesting and manufacturing business in South Australia (30 thousand tonnes per annum).

## **Current Projects**

**Straits Resources** Environmental Impact of a solar salt field on coastal zone (10 000 hectares)  
Current

**Shark Bay Salt Joint Venture**, Biological Management and advise on technical design for Shark Bay salt field (1-2 Million tonnes per annum), Current.

**Cheetam Salt Pty Ltd**, Biological Management and advise on technical design for Bajool, Port Alma and Bowen salt fields (approx 250 thousand tonnes per annum), Current.

**Cheetham Salt** Biological Management of evaporating ponds, current

**Onslow Salt Pty Ltd**, Biological Management and advice on technical design for Onslow salt field (2-3 Million tonnes per annum), Current.

## **Recent Projects/Contracts**

**Placer Granny Smith, 2003** Survey of invertebrate fauna near to Lake Carey.

**AngloGold, 2005** Survey of invertebrate fauna near to Lake Carey

**Cheetham Salt 2004** End of mining closure plan

**Newmont (Golden Grove) Operations 2004**, developing and implementing a benchmark methodology for evaluating discharges to natural wetlands

**WA Salt Pty Ltd 2003**, Design and advice on proposed Taarblin Lake Salt field.

**CALM, 2003** Develop a technique for characterising natural saline wetlands.

**CALM, 2002** Environmental Impact of proposed modifications to Lake Bryde Catchment.

**URS Pty Ltd, 2002** Economics and technical advice for proposed salt field at Lake Carey.

**CALM, 2002** Risk analysis of antifouling chemicals in bores.

**Placer Granny Smith, 2000** Review and discussion on the evaporation rates of brine.

**Outokumpu Nickel, 2001** Recovery of Lake Ned after saline discharge.

**Sons of Gwalia. 2001** Licence to discharge review Lake Carey

**Homestake Darlot Gold Mine, 2001** Notice of intent for saline discharge to Lake Darlot

**Cognis Pty Ltd, 2001** Environmental Management Plan for betacarotene production

**CALM, 2001** Saline discharges into wetlands. (Co-author)

**Placer (Wallaby) 2000** Evaluation of saline discharge into Lake Carey (Author)

**Outukumpu Nickel, 2000** Evaluation of saline discharge to Lake Ned.

**CALM**, 1999, Commercial uses of saline groundwater extracted from the Toolibin Lake Region (Co-author)

**Homestake**. 1999 Evaluation of discharge into Lake Darlot (Co-author)

**Placer /Acacia GM**. 1999 Evaluation of discharge into Lake Carey (Author)

**Sons of Gwalia**. 1999 Evaluation of discharge into Lake Raeside (Co-author)

**WA Department of Environmental Protection** 1999, Discussion paper on the issue facing saline wetlands in the Yilgarn and Goldfields regions. (Author)

**Golders**. 1998, Collective modelling of hydrological function of Lake Carey (Murrin Murrin East) (Author)

**Onslow Salt Pty Ltd**. Current Biological management and monitoring of saline production ponds. (Author)

**Sons of Gwalia**. 1998 Evaluation of discharge into Lake Carey (Co-author)

**Sons of Gwalia**. 1998 Evaluation of Saline Discharge into Natural Wetlands Yilgarn Region (Co-author)

**Pacific Salt**. Current, Ongoing brief on Salt Field Biology (Author)

**Meningie Council**. Current. Co Project Management of a salt interception scheme using novel technology. (Author)

**WA Department of Environmental Protection** 1998, Evaluation Criteria for Saline Discharges. (Co-author)

**WA Department of Environmental Protection**. October '97 Classification of saline wetlands, a discussion paper. (Author)

**G Renton and Partners** April /July '97 Pre Feasibility Survey of Timur Timor for Potential Saltfield Sites. (Author)

**SAGRIC**. April '97 Salt field technologist for iodine project in Vietnam. (Author)

**SAGRIC**. November '96 to April '97 Salt field economist for iodine project in Vietnam. (Author)

**WA Department of Environmental Protection**. August '97 Preliminary report on the value of saline lakes for conservation and commercial potential of saline ground water. (Author)

**Salisbury Council**. February '96 Saline Wetlands. (Co-author)

**Penrice Soda Products PL**. May '96. Production Bores. (Author)

**WA Salt Supply**. May '96 Production Review, negotiate bore water allocations. (Author)

**Pacific Salt**. April '96 Production Review and suggest strategies to reduce algal blooms. (Author)

**Penrice Soda Products PL.** April '96. Procedure for online titrator. (Author)

**Penrice Soda Products PL.** Feb '96. Elaborate on operational advantages/disadvantages of a salt floor. (Author)

**Penrice Soda Products PL.** Feb '96. Design sampling program to determine source and destination of heavy metals in brines. Review literature and determine potential pathways within wetlands/saltfield. (Author)

**Penrice Soda Products PL.** Dec '95. Model the major ion concentrations in bitterns. (Author)

**Penrice Soda Products PL.** Aug '93—Nov '95. Penrice own and operate the 10,000 ha Dry Creek Saltfields in South Australia. The consultancy's principal objective was to reinstate managerial control of technical issues affecting salt production. Specific tasks were: monitor and control algal blooms, to introduce a relevant chemical and biological monitoring program, train operators, negotiate with neighbours impacting on production, environmental management issues relating to both the saltfields and the neighbouring Barker Inlet, evaluation of production models, reviewing current operating procedures and devising operating strategies to minimise the chance of salt production shortfalls. (Author)

**The Business Centre SA.** Develop a business plan and a development blueprint for an independent South Australian lake-salt producer. Incorporate a quality assurance process leading to ISO 9002 accreditation. (Author)

**Cheetham Salt.** Construct mass balance model of water movement in six saltfields, incorporating evaporation, seepage, decantation and pumping variables. (Author)

**Psynergy Pty Ltd.** Recovery of high value evaporites from concentrated brines. Continuing onto development trials in South Australia. (Author)

**Leftsea/ICI.** 1995. Established a pilot plant for the joint venturers at Yarwun in Central Queensland, growing and harvesting *Dunaliella salina* using novel technology. (Author)

**JCU Saltfield Consultancy.** 1985-90. This project was conducted at Bajool in Queensland where two saltfields were experiencing problems with algal blooms and trace metal contamination of salt. The four year long consultancy undertook to identify the problems, define the causative factors, and set-up a monitoring program for critical chemical factors. After modelling the natural system and its impact on the production of salt, management techniques for correcting the problems were developed. (Author)

**Celltech Industries PL.** 1991. Developed a feasibility study on the growing and harvesting of the marine microalga *Dunaliella salina*. (Author)

**Pelican Creek Dam Bloom.** 1993. Application of sediment chemistry models to blue-green algae blooms in farm dams and water supplies. (Author)

**Wesfarmers Algal Biotechnology.** 1984—'85. Preliminary research on growing and harvesting *Dunaliella salina*. Scaling up a pilot plant to commercial production over a period of eighteen months. (Author)

**University of Tasmania Short Term Projects.** Allocation of marine farming areas. Ageing Doughboy scallops. Evaluating an Australian safety standard. Ownership of offshore resources. Evaluating the impact of marine farming on the environment and public amenity. Reviewing public

administration of marine farming in Tasmania. (Author)

## **Publications**

Several publications in draft.

Presentation to the 8th International Symposium on Saline Lakes, 2002.

George, D. R. and M. Coleman (2001). Hidden Menace or opportunity - Groundwater hydrology, playas and commercial options for salinity in wheatbelt valleys. Dealing with salinity in wheatbelt valleys, Merredin.

Ahmed, M., A. Arakel, et al. (2000). Integrated power, water and salt generation: a discussion paper. International Conference on Sea Water Desalination Technologies on the Threshold of the New Millennium., Kuwait, Elsevier.

Guest Speaker Salt lake Ecology Workshop July'99

Guest Speaker Salt Lake Workshop September 2001

Determination of the Relative Viscosity of Sea Water Evaporites  
Reviewed for publication in the International Journal of Salt Lakes

Phosphate Mass Balance in a Constructed Saline Wetland Reviewed for publication in the International Journal Of Salt Lakes

Optimising Solar Saltfields by Management of the Biology, 6th International Symposium on Saline Lakes, Beijing, China 1994.

Co-Author, with Dr M White, The Role of Biological Disturbances on the Production of Salt, 7th Symposium on Salt, Tokyo, 1993.

Co-Author, with Prof D Griffiths, The Biology of a Solar Salt Field, JCU, Townsville, 1987

A Critical Review of the Management of the Aquatic Environment of the Derwent Estuary, Uni of Tas, Hobart, 1983 .

Guidelines to Authors in Environmental Studies: Legal Referencing, Uni of Tas, Hobart 1983.

Marine Pollution in the Derwent: The Origin and the Destination, Uni of Tas, 1982.

## Employment

**Research Scientist, Cheetham Salt, 1990 - 1993.** This position entailed evaluating the various costs and benefits of solutions to the saltfield's production quality problems. Monitoring and controlling algal blooms. Initiating management changes to maximise the quality and quantity of salt; modelling the saltfield's production and training staff were part of that process, as was providing technical support and problem solving. I was also responsible for liaising with government departments concerned with mine management and environmental matters.

**Environmental Officer, Dampier Salt, 1980-2.** Under direction from the Department of Conservation, I assessed the environmental impact of bitterns discharge from the field. Other responsibilities included monitoring the pond system, maintaining brine shrimp and algae cultures and care of Aboriginal Heritage sites on the lease.

**Temporary Positions:** Research Assistant, University of Tasmania, Federal Marine Resources (Oil & Gas) Allocation.  
Lecturer, FAUI Underwater Naturalist course, Hobart.

## Associations

Environmental Consultants Association  
Who's Who in the World 1996 13th Edition

## Professional Development

8th International Symposium on Saline Lakes, Krasnoyarsk Russia 2002  
Environmental Auditor Training, Adelaide October 2000  
8th World Salt Symposium The Hague Netherlands 2000  
Saltlake Ecology Workshop July '99  
Tamin Landcare Induction Course Aug '97  
International Wetlands Conference 96 Perth  
Coast to Coast '96, Adelaide, April 1996  
Environmental Audit Workshop, Adelaide, 1995  
6th International Symposium on Saline Lakes ,1994 Beijing China  
Fitzroy Catchment Symposium, Rockhampton, 1992  
Workshop on Environmental Management for Mining in Queensland (Department of Resource Industries), 1992  
Seminar on Environmental Legislation in Queensland (Department of Environment & Heritage), 1991  
Second Coastal Zone Management Workshop, Yeppoon, 1990  
Australian Society for Phycology and Aquatic Biology Conference, Townsville, 1987  
Australian Marine Sciences Association Conventions, 1987, 1983  
Australian & New Zealand Association for the Advancement of Science, Perth, 1983  
Workshop on the North-West Flora and Fauna of WA, Perth, 1981