

# CHAPTER 1

## INTRODUCTION

1.1 When blue-green algae (cyanobacteria) occur in excessive numbers in water supplies they can have detrimental effects on human health, stock and the environment and can cause severe economic losses to aquaculture, fishing and tourist industries. The occurrence of toxic blue-green algae blooms is a world wide phenomenon<sup>1</sup> and among those causing concern are species of *Nodularia*, *Anabaena*, *Aphanizomenon*, *Oscillatoria* and *Microcystis*.<sup>2</sup>

1.2 Algal blooms were reported in the Darling River in 1830<sup>3</sup> and in Lake Alexandrina, South Australia in 1878.<sup>4</sup> In 1903 one case of 'Barcoo Fever' in Queensland was attributed to blue-green algae.<sup>5</sup> Algal blooms have been a regular feature in areas such as Chaffey Dam near Tamworth,<sup>6</sup> Lake Alexandrina in South Australia<sup>7</sup> and Peel Harvey Inlet in Western Australia,<sup>8</sup> but have been dealt with on a local basis. In November 1991 algal blooms in New South Wales extended over 1000 kilometres of the Darling River<sup>9</sup> and a State of Emergency was declared because of the severity of the situation. This incident focussed the

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1 National Herbarium of New South Wales, Submission No.4, p.1.

2 Jackson A, Runnegar M, Falconer I and McInnes A (1985) 'Cyanobacterial (Blue-green algae) Toxicity of Livestock', in *Plant Toxicology* Ed. Seawright A, Hegarty M, James L and Keeler R, Queensland Poisonous Plants Committee, Yerongpilly Qld, p.500.

3 'What can be done about toxic algal blooms?' *Ecos* 72 Winter 1992: 14-19, p.14.

4 Francis G (1878) 'Poisonous Australian Lake,' *Nature*, 2 May 1878, pp.11-12

5 Queensland Water Quality Task Force, *Interim Report on Freshwater Algal Blooms in Queensland*, 31 July 1992, p.7; Hayman, J (1992) 'Beyond the Barcoo - probable human tropical cyanobacterial poisoning in outback Australia', *Medical Journal of Australia* 157: 794-96.

6 Sinclair, Evidence, 5 August 1993, p.735.

7 Burch, Evidence, 12 August 1993, pp. 769-70.

8 Bursill, Evidence, 12 August 1993, p.770.

9 Cullen, Submission No.42, p.2.

attention of the community and governments on what had finally become recognised as a national problem.

1.3 In some areas in recent years there has been a common perception of a sharp increase in the incidence of toxic algae in Australia<sup>10</sup> which may reflect the increased media attention.<sup>11</sup> As a result of continued public concern, on 7 May 1992 the Senate Standing Committee on Environment, Recreation and the Arts was given a reference to inquire into Australia's water resources. The Committee was required to inquire into:

- a) The management of water, water use and water quality and the agencies involved, including those in Commonwealth, State/Territories and Local Government; and
- b) the impacts of agricultural, industrial and domestic use of and inputs to Australia's inland waterways, including rivers, tributaries, streams, creeks, lakes and underground waterways,

and in keeping with ecologically sustainable development, the Committee was to inquire particularly into:

- c) whether flows allocated for environmental needs should be required in regulated rivers, or licence to divert should be restricted to enable adequate flows to be maintained;
- d) the extent to which nutrients should be reduced by removal of waste water, feedlot runoff, irrigation flows and agricultural runoff; and
- e) the impact of these issues on continued sustainable farming, and the economic and social impacts on rural communities,

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10 District Council of Meningie, Submission No.3, p.2; Chaffey Dam Catchment Management Advisory Committee, Submission No.25, p.1; Van Dok, W, Hart, B and Boyle, R (1991) *Algal Problems in Victoria*, Water Studies Centre, Monash University, December 1991, p.1.

11 New South Wales Blue-Green Algae Task Force, Final Report, *Blue-Green Algae*, August 1992, p.18.

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commencing with an inquiry into the impact of toxic algae upon Australian waterways.

1.5 Although the impact of toxic algae upon Australian waterways is the main consideration of this report, all of these issues are interrelated and shall be dealt with accordingly. This report provides a brief summary of the physical and chemical factors attributed to causing outbreaks of algal blooms in chapter 2. Chapter 3 looks at the implications in terms of the health effects, the public concern generated and the economic and environmental issues. This chapter also covers the techniques for prediction, monitoring, management and control of algal blooms. Chapter 4 looks at the roles of the three levels of government and the community in a national approach to management of algal blooms and in respect to integrated catchment management. Chapter 5 provides a summary and conclusions.

1.6 The serious implications for the economy and the level of public concern have resulted in the allocation of substantial resources to research and management of algal blooms. During the course of this inquiry, the Committee has seen evidence of significant developments in the cooperation and coordination of State/Territories, local and Federal governments with the community in some areas, although more needs to be done. Notwithstanding this national approach, it is important to put algal blooms in perspective in relation to other water resource issues. This report addresses those issues.

### **Conduct of the Inquiry**

1.7 The terms of reference were advertised in newspapers with a national coverage in May 1992. The Committee received 104 submissions and a number of supplementary submissions which are listed in Appendix 1.

1.8 The Committee examined 95 witnesses at 15 public hearings representing 51 individuals or organisations (See Appendix 2). The hearings commenced in Canberra on 11 September 1992. Before the public hearing in Shepparton on 24 September 1992, the Committee visited the Murray-Darling Freshwater Research Centre and the sewage treatment works. The next day the Committee held a public hearing in Melbourne. Following a visit to Perth on 22 October 1992, the Committee inspected the Peel Harvey Inlet, Mandogalup vegetable

areas, Mundijong sheep assembly areas, Pinjarra and Dawesville Channel.

1.9 The first hearing for 1993 was held in Melbourne on 27 July 1993. A series of hearings was then held in Sydney on 2 August 1993, Windsor, Dubbo and Walgett on 3 August 1993, Cubbie Station and Dalby on 4 August 1993 and Moree and Tamworth on 5 August 1993. Further hearings were held in Adelaide on 12 August 1993 and Canberra on 27 August 1993. A round table conference was held on 26 November 1993 to discuss with experts and representatives of key agencies the priorities and future directions of algal bloom management.

### **Acknowledgments**

1.10 The Committee wishes to thank all the people who contributed to the inquiry by preparing written submissions, by giving oral evidence or by assisting with the arrangements for public hearings and inspections. The Committee is grateful for the interest shown and the advice provided. Although it was not possible to invite all of those who made submissions to give oral evidence or to mention all submissions in the report, the Committee took into account all of the material provided in the preparation of its report.