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Environment Protection Act 1970 (No. 8056)

STATE ENVIRONMENT PROTECTION POLICY No. W-34B (The Waters of the Western District Lakes)

*At the Executive Council Chamber, Melbourne
Tuesday 12th January 1981*

PRESENT:

His Excellency the Governor of Victoria	
Mr. Thomson	Mr. Hunt
Mr. Haddon Storey	Mr. Crozier
Mr. Houghton	Mr. Granter
Mr. Jona	Mr. Austin
Mr. Wood	Mr. Lacy
Mr. Jenkins	Mr. Weideman

Whereas section 16 of the *Environment Protection Act 1970* provides that the Governor in Council may, on the recommendation of the Environment Protection Authority, by Order published in the *Government Gazette*, declare the environment protection policy to be observed with respect to the environment generally or in any portion or portions of Victoria or with respect to any element or elements or segment or segments of the environment;

And whereas section 17(1) of the said Act provides that in and by any Order made under section 16 the Governor in Council may, for securing the observance of State environment protection policy declare by the Order—

- (a) classify any area or any segment or element of the environment in any area for the purposes of the Order;
- (b) set aside any area or areas or any segment or segments of the environment within which the discharge, emission or deposit of wastes or the emission of noise is prohibited or restricted as specified in the Order;
- (c) make rules to be observed for carrying any such prohibition or restriction into effect; and
- (d) delegate to any protection agency such of the powers of the Authority as are necessary for securing the observance of the Order;

And whereas section 18 of the said Act provides that State environment protection policy declared in any Order under section 16 shall establish the basis for maintaining environmental quality sufficient to protect existing and anticipated beneficial uses in the area affected by the Order and in particular shall include in terms sufficiently clear to give an adequate basis for planning and licensing functions—

- (a) the boundaries of any area affected;
- (b) identification of the beneficial uses to be protected;
- (c) selection of the environmental indicators to be employed to measure and define the environmental quality;
- (d) a statement of the environmental quality objectives (where practicable); and
- (e) the programme (if any) by which the stated environmental quality objectives are to be attained and maintained;

And whereas in accordance with section 19 of the said Act the Authority caused the publication of notice of intention to declare

State environment protection policy in respect of the waters of the Western District Lakes in three issues of a newspaper over a period of not less than twenty-one days;

And whereas the Authority has now considered the information submitted by various persons;

And whereas more than two months have elapsed since the publication of the last notice published in the aforementioned newspapers;

Now therefore His Excellency the Governor of Victoria by and with the advice of the Executive Council thereof and on the recommendation of the Environment Protection Authority doth by this Order declare the following to be the State environment protection policy to be observed for the area referred to in the Order and with respect to the elements and segments of the environment referred to in the Order (that is to say):

STATE ENVIRONMENT PROTECTION POLICY No. W-34B (THE WATERS OF THE WESTERN DISTRICT LAKES)

1. This Order may be cited as the State Environment Protection Policy (Waters of the Western District Lakes) No. W-34B (hereinafter referred to as the Policy) and shall come into operation upon publication in the *Government Gazette*.

2. This Policy is divided into parts as follows:

- | | |
|----------|---|
| Part I | — Preliminary |
| Part II | — Boundaries of the Area Affected |
| Part III | — Beneficial Uses to be Protected |
| Part IV | — Water Quality Indicators and Objectives |
| Part V | — Attainment Programme |

PART I—PRELIMINARY

3. In this Policy, unless inconsistent with the context or subject matter:

"Act" means the *Environment Protection Act 1970* as amended.

"Authority" means the Environment Protection Authority constituted under the Act.

"Background Level" means the level of an indicator (measured in a manner and at a location specified by the Authority) in the surface waters outside the influence of any waste containing that indicator.

"Beneficial Use" means a use of the environment or any element or segment of the environment that is conducive to public benefit, welfare, safety, or health and which requires protection from the effects of waste discharges, emissions and deposits.

"Delegated Agency" means a protection agency to which the Authority has delegated powers or functions under section 68 of the Act with respect to the grant, refusal or enforcement of licences.

"Groundwater" means the water beneath the land surface which is contained in aquifers.

"Guidance Level" means the level of an indicator which is used as a guideline in assessing the achievement of a qualitative objective.

"Licence" means a licence issued by the Authority or a protection agency on behalf of the Authority being a licence in writing in the prescribed form authorising the person to whom it is issued to discharge, emit or deposit wastes into the environment.

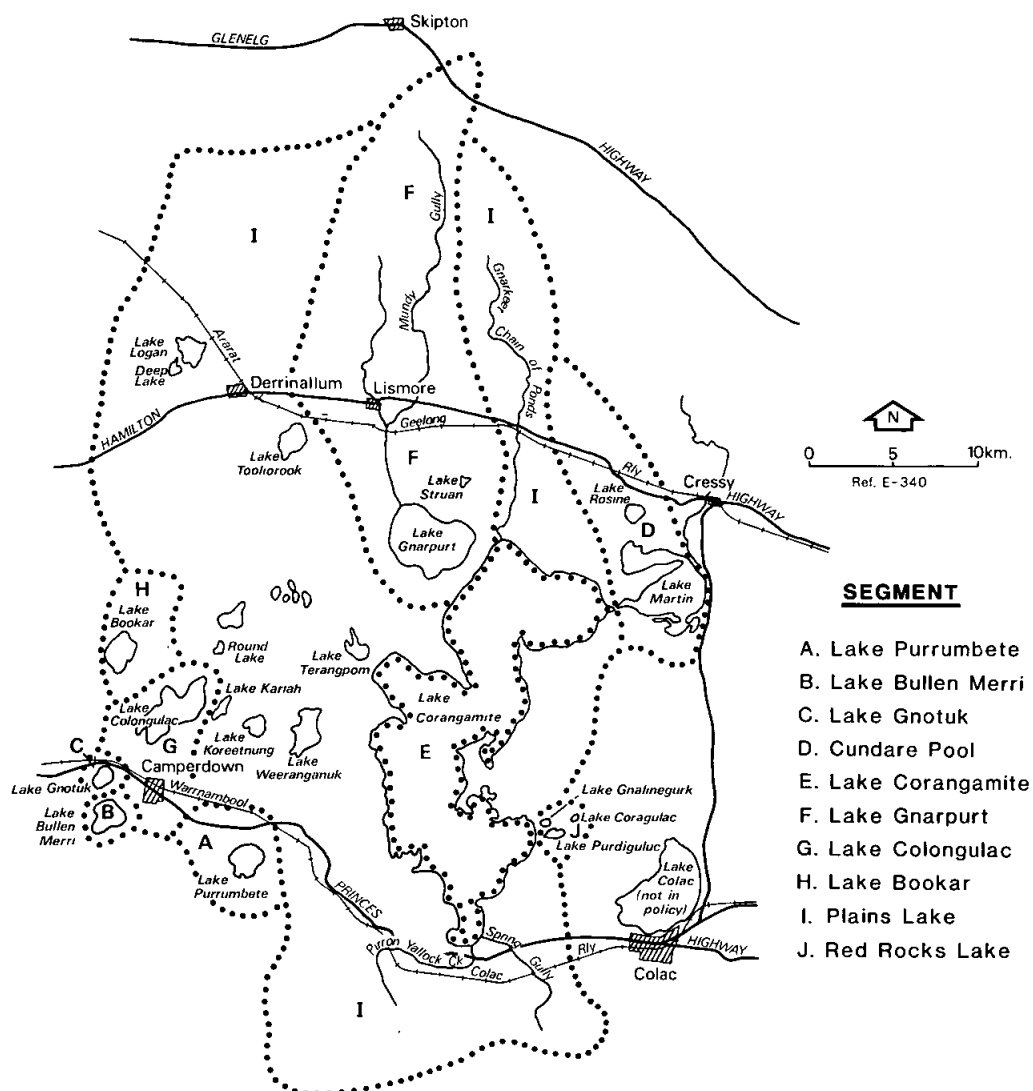


FIGURE 1. POLICY AREA W-34B(WESTERN DISTRICT LAKES)
SHOWING SEGMENT BOUNDARIES

"*Licensing Provisions*" means Sections 20 to 31 inclusive of the Act.

"*Mixing Zone*" means an area contiguous to a waste discharge point and designated in a licence for the mixing of wastes with receiving waters.

"*Policy Area*" means the area in which this Policy shall be observed as specified in Clause 5.

"*Responsible Authority*" in relation to sewerage means any authority with jurisdiction over the provision of, or requirement for sewerage including those authorities with control over the subdivision of land.

"*Segment*" in relation to the environment means any portion or portions of the environment expressed in terms of volume, space, area, quantity, quality or time or any combination thereof.

"*Sewered Property*" means any sewered land or premises and any land or premises which have been declared by a sewerage authority in the manner prescribed by statute to be sewered property.

"*Sewerage*" means works for the collection, treatment and disposal of wastewater.

"*Surface Waters*" means the surface waters of the Policy area and includes any river, stream, reservoir, billabong, creek, anabranch, canal, spring, open drain, swamp, channel, lake, lagoon, natural or artificial water course, bay, tidal waters or coastal waters, excluding lagoons or pondages used exclusively for the purpose of waste treatment, waters within water supply distribution systems, farm dams, private ponds and the interstitial waters of sediments.

"*Waste*" includes any matter prescribed to be waste and any matter, whether liquid, solid, gaseous, or radioactive, which is discharged, emitted, or deposited in the environment in such volume, constituency or manner as to cause an alteration of the environment.

4. The purpose of this Policy is to establish a basis for attaining and maintaining a level of water quality sufficient to protect the identified beneficial uses of the surface waters and groundwaters of the Policy area.

The major community goals relevant to this purpose are:

- (a) To preserve the inherent attributes of the lakes within the Policy area where these attributes are distinctive and beneficial to the community, particularly in terms of water quality to protect the beneficial uses.
- (b) To use the lakes to assist the welfare and economic well-being of the regional community.
- (c) To safeguard the beneficial uses identified for each lake; and protect them from the effects of waste discharges.
- (d) To develop and manage the lakes to attract tourists and visitors to assist the regional economy.

PART II — BOUNDARIES OF THE AREA AFFECTED

5. This Policy shall be observed with respect to all surface waters and groundwaters contained within the Lake Corangamite Basin with the exception of the Lake Colac Area and the Woody Yaloak Creek (as shown in Fig. 1).

6. For the purpose of this Policy, the following segments of the environment as delineated by the boundaries in Figure 1 are classified:

- A. *Lake Purrumbete Segment* The surface waters of Lake Purrumbete and its catchment.
- B. *Lake Bullen Merri Segment* The surface waters of Lake Bullen Merri and its catchment.
- C. *Lake Gnotuk Segment* The surface waters of Lake Gnotuk and its catchment.
- D. *Cundare Pool Segment* The surface waters of the Cundare Pool and its catchment, excluding the Woody Yaloak Creek.
- E. *Lake Corangamite Segment* The surface waters of Lake Corangamite.
- F. *Lake Gnarpurt Segment* The surface waters of Lake Gnarpurt and its catchment.
- G. *Lake Colongulac Segment* The surface waters of Lake Colongulac and its catchment.
- H. *Lake Bookar Segment* The surface waters of Lake Bookar and its catchment.
- I. *Plains Lakes Segment* The surface waters of the Lake Corangamite catchment including numerous small lakes such as Lakes Weeranganuk, Koreetnung and Kariah and their catchments but excluding Lake Corangamite itself.
- J. *Red Rock Lakes Segment* The surface waters of Lakes Purdiguluc, Gnoliegurk, Werowrap, Coragulac and associated smaller lakes.

K. *Groundwater Segment* The groundwaters beneath the Policy Area.

PART III — BENEFICIAL USES TO BE PROTECTED

7. Segment A — *Lake Purrumbete*

The following beneficial uses shall be protected with respect to the water quality of the Lake Purrumbete segment:

- (a) *Agricultural Water Supply*—
farmstead (washing, dairies, etc.)
stock water supplies
irrigation water
- (b) *Recreation*—
primary contact (e.g. swimming, water skiing)
secondary contact (e.g. boating, fishing)
passive (e.g. sightseeing, nature study)
- (c) *Production of Edible Fish*—
recreational fishing
commercial fishing
- (d) *Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife*—level II protection
- (e) *Maintenance and Preservation of Foreshore Vegetation*
- (f) *Scientific and Educational Uses*

8. Segment B — *Lake Bullen Merri*

The following beneficial uses shall be protected with respect to the water quality of the Lake Bullen Merri segment:

- (a) *Recreation*—
primary contact (e.g. swimming, water skiing)
secondary contact (e.g. boating, fishing)
passive (e.g. sightseeing, nature study)
- (b) *Production of Edible Fish*—recreational fishing
- (c) *Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife*—level II protection
- (d) *Maintenance and Preservation of Foreshore Vegetation*
- (e) *Scientific and Educational Uses*

9. Segment C — *Lake Gnotuk*

The following beneficial uses shall be protected with respect to the water quality of the Lake Gnotuk segment:

- (a) *Recreation*—passive (e.g. sightseeing, nature study)
- (b) *Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife*—level I protection
- (c) *Maintenance and Preservation of Foreshore Vegetation*
- (d) *Scientific and Educational Uses*

10. Segment D — *The Cundare Pool*

The following beneficial uses shall be protected with respect to the water quality of the Cundare Pool segment:

- (a) *Agricultural Water Supply*—
stock water supplies
irrigation water
- (b) *Recreation*—passive (e.g. sightseeing, nature study)
- (c) *Production of Edible Fish*—commercial fishing
- (d) *Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife*—level III protection
- (e) *Maintenance and Preservation of Foreshore Vegetation*
- (f) *Scientific and Educational Uses*

11. Segment E — *Lake Corangamite*

The following beneficial uses shall be protected with respect to the water quality of the Lake Corangamite segment:

- (a) *Recreation*—
primary contact (e.g. swimming, water skiing)
secondary contact (e.g. boating, fishing)
passive (e.g. sightseeing, nature study)
- (b) *Production of Edible Fish*—
recreational fishing
commercial fishing
- (c) *Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife*—level II protection
- (d) *Maintenance and Preservation of Foreshore Vegetation*
- (e) *Scientific and Educational Uses*

12. Segment F — *Lake Gnarpurt*

The following beneficial uses shall be protected with respect to the water quality of the Lake Gnarpurt segment:

- (a) *Recreation*—
secondary contact (e.g. boating, fishing)
passive (e.g. sightseeing, nature study, shooting)
- (b) *Production of Edible Fish*—
recreational fishing
commercial fishing

- (c) Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife—level III protection
- (d) Maintenance and Preservation of Foreshore Vegetation
- (e) Scientific and Educational Uses
- (f) Industrial Water Supply—sand washing.

13. Segment G—*Lake Colongulac*

The following beneficial uses shall be protected with respect to the water quality of the Lake Colongulac segment:

- (a) Recreation—
 - secondary contact (e.g. boating, fishing)
 - passive (e.g. sightseeing, nature study)
- (b) Production of Edible Fish—
 - recreational fishing
 - commercial fishing
- (c) Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife—level III protection
- (d) Maintenance and Preservation of Foreshore Vegetation
- (e) Scientific and Educational Uses

14. Segment H—*Lake Bookar*

The following beneficial uses shall be protected with respect to the water quality of the Lake Bookar segment:

- (a) Recreation—
 - secondary contact (e.g. boating, fishing)
 - passive (e.g. sightseeing, nature study)
- (b) Production of Edible Fish—commercial fishing
- (c) Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife—level III protection
- (d) Maintenance and Preservation of Foreshore Vegetation
- (e) Scientific and Educational Uses

15. Segment I—*Plains Lakes*

The following beneficial uses shall be protected with respect to the water quality of the Plains Lakes segment:

- (a) Recreation—passive (e.g. sightseeing, nature study, shooting)
- (b) Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife—level III protection
- (c) Maintenance and Preservation of Foreshore Vegetation
- (d) Scientific and Educational Uses

16. Segment J—*Red Rock Lakes*

The following beneficial uses shall be protected with respect to the water quality of the Red Rock Lakes segment:

- (a) Recreation—passive (e.g. sightseeing, nature study)
- (b) Maintenance and Preservation of Aquatic Ecosystems and Associated Wildlife—level I protection
- (c) Maintenance and Preservation of Foreshore Vegetation
- (d) Scientific and Educational Uses

17. Segment K—*Groundwater*

The following beneficial use shall be protected with respect to the water quality of the groundwater segment:

- (a) Agricultural Water Supply—
 - farmstead (washing, dairies, etc.)
 - stock water supplies
 - irrigation water

PART IV—WATER QUALITY INDICATORS AND OBJECTIVES

18. The level of water quality required to protect the identified beneficial uses in each segment and downstream waters is defined by the water quality indicators and objectives specified under clause 19.

19. The water quality indicators and objectives for each of the segments referred to in this Policy shall be those prescribed in the respective schedules as follows:

Segment	Schedule
Lake Purrumbete segment	A
Lake Bullen Merri segment	B
Lake Gnotuk segment	C
Cundare Pool segment	D
Lake Corangamite segment	E
Lake Gnarpurt segment	F
Lake Colongulac segment	G
Lake Bookar segment	H
Plains Lakes segment	I
Red Rock Lakes segment	J
Groundwater segment	K

20. The water quality indicators and objectives specified under clause 19 shall apply to all groundwaters in Segment K and surface waters in each other segment respectively, except where provisions are made to the contrary in a licence by the designation of mixing zones.

21. The volume, constituency and location of waste discharges to the surface waters shall be consistent with the attainment and maintenance of the water quality objectives for those waters.

PART V—ATTAINMENT PROGRAMME

General

22. *Implementation.* The objectives of this Policy shall be attained and maintained by the following general means:

- (a) control of the discharge of wastes to the surface waters through the licensing provisions of the Act and, where applicable, through Regulations introduced under the Act; (see detailed clauses 26 to 35).
- (b) adequate sewerage and drainage services and adherence to good erosion control practices; (see detailed clauses 35 to 39).
- (c) appropriate location and management of waste disposal and waste generating activities; (see detailed clauses 40 to 49) and
- (d) educational, research, monitoring and investigation activities; (see detailed clauses 50 to 52).

This Policy is binding on all Government departments, agencies and instrumentalities and all such bodies shall observe and implement this Policy in so far as it relates to their powers, duties and responsibilities.

23. *Implementation plans.* The Authority shall progressively develop, co-ordinate and publish implementation plans based on the provisions of the Act and this Policy for the attainment and maintenance of Policy objectives. Such plans may make provision for a staged attainment of Policy objectives.

24. *Planning Policy.* This Policy shall be implemented having regard to any relevant Statements of Planning Policy made under the Town and Country Planning Act 1961.

25. *Review.* The policy shall be subject to review and amendment as new information and circumstances warrant. Substantial changes in the hydrological regime of the lakes occasioned by variations in the evaporation/rainfall balance may be cause for review and, in particular, the Policy shall be reviewed if the surface level of Lake Colongulac falls below Reduced Level 136 m Australian Height Datum.

Waste Discharge Licensing

26. *Relationship to Policy Objectives.* Subject to the provisions of this Policy, in considering applications for a licence the Authority or delegated agency shall have regard to the effect of the discharge, together with the collective effect of other waste discharges, on the beneficial uses to be protected under this Policy, so that the licence, if granted, and any conditions to which it is subject shall be consistent with the attainment and maintenance of the water quality objectives.

27. *Future Waste Discharge.* In considering applications for a licence the Authority or delegated agency may have regard to the need to preserve capacity of the surface waters to receive future waste discharges.

28. *Mixing Zones.* In granting a licence, the Authority or delegated agency may designate a mixing zone within which certain water quality objectives in relation to the indicator or indicators specified in the licence are not required to be achieved. Mixing zones may not be designated for the indicators odour, floatable matter and settleable matter. The designation of a mixing zone is subject to the following requirements:

- (a) there must be no significant detriment within the affected segment or segments to any protected beneficial use as a result of the mixing zone;
- (b) the area of water and the length of stream bank or lake foreshore occupied by mixing zones, both individually and collectively, must be as small as practicable, having regard to beneficial uses protected within the segment or segments, the location of the discharge point and the required degree of treatment of the discharge;
- (c) the licence must clearly specify the location and size of the mixing zone and the indicator or indicators to which it applies;
- (d) within each mixing zone, the level of dissolved oxygen shall not be less than 2 mg/l; there shall be no objectionable colour, or excessive growths of algae or other aquatic plants; and there shall be no mortality of fish or other important motile species as a result of toxicants, temperature, pH or changes in salinity (filterable residue);
- (e) licence monitoring programmes may require adequate water quality monitoring in and around mixing zones including biological monitoring and effluent toxicity testing where appropriate;

- (j) where applicable to the beneficial uses protected in the affected segment or segments, mixing zones for the relevant indicators shall avoid—
- (i) areas important for primary contact recreation;
 - (ii) off-takes for domestic, industrial and agricultural water supplies;
 - (iii) spawning and nursery areas of aquatic species and other areas of important ecological significance;
 - (iv) the creation of barriers for migratory species.
29. *Exemptions.* Exemptions to waste discharge licensing made under Section 20(11) of the Act do not exempt these waste discharges from the need to comply with the objectives and provisions of this Policy.

30. *Lake Gnotuk Segment.* For the purpose of Section 17(1) of the Act, the Lake Gnotuk segment is hereby set aside as a segment of the environment in which the discharge, emission or deposit of waste is prohibited or restricted as follows:

No licence shall be granted to discharge wastes to the surface waters of the Lake Gnotuk segment.

31. *Red Rock Lakes Segment.* For the purpose of Section 17(1) of the Act, the Red Rock Lakes segment is hereby set aside as a segment of the environment in which the discharge, emission or deposit of waste is prohibited or restricted as follows:

No licence shall be granted to discharge wastes to the surface waters of the Red Rock Lakes segment.

32. *Groundwater.* For the purpose of Section 17(1) of the Act, the groundwater beneath the Policy area is hereby set aside as a segment of the environment in which the discharge, emission or deposit of wastes is prohibited or restricted as follows:

No licence shall be granted for the direct injection of waste to the groundwaters by means of a bore, well, infiltration basin or other similar structure specifically designed for this purpose, except for the purpose of artificially recharging aquifers without deterioration of water quality.

33. *Heavy Metals.* Where a licence is issued for the discharge of wastes to the Policy area the concentrations of heavy metals in such discharges shall not exceed the limits given in Table 1.

34. *Biochemical Oxygen Demand, Suspended Solids, Turbidity and Settleable Matter.* Where a licence is issued for the discharge of wastes, other than wastes contained in stormwater, to the Policy area the level of biochemical oxygen demand (BOD), suspended solids, turbidity and settleable matter shall not exceed the limits given in Table 2.

Servicing

35. Sewerage

- (a) Responsible authorities shall ensure that new subdivisions of land are provided with sewerage at the time of subdivision or that the allotments created by the subdivision are capable of adequately treating and retaining domestic wastewater within the boundaries of each allotment. Exceptions to this requirement may apply in a zoned township or urban area where the total number of allotments created by one or more subdivisions from a single parcel of land existing under one title at the date of gazettal of this Policy is less than 10 allotments.
- (b) Sewerage shall be provided as soon as possible to all existing subdivisions of land where domestic wastewaters cannot be adequately treated and retained within the boundaries of each allotment. Where practicable, sewerage shall be provided prior to the commencement of building works. High priority should be given to sewerage existing subdivisions where building works have already commenced.
- (c) In determining whether domestic wastewaters are capable of being adequately treated and retained within the boundaries of each allotment, responsible authorities shall have regard to the various guidelines published by the Soil Conservation Authority, Health Department and Environment Protection Authority, in respect of factors such as the dimensions and area of the allotments, the intensity of the proposed use, climatic and soil conditions, water supply conditions and physical characteristics of the site.
- (d) In sewered areas, the appropriate steps shall be taken by sewage authorities to ensure that all premises are connected to the sewerage system for the purpose of domestic wastewater disposal.

36. *Discharge to Sewer.* The discharge of waste from any sewered property or any property where sewerage reticulation is available should be to the sewerage system, if that waste (with pretreatment, if necessary) is acceptable to the appropriate sewerage authority.

37. *Disposal of Sewage Effluent.* Detailed consideration and encouragement should be given to the reclamation and re-use of

wastewater and, in particular, to the discharge of sewage effluent to land preferably after detention of treated effluent for at least 30 days.

38. *Road Construction.* Construction of streets and roads should be carried out in accordance with *Guidelines for minimising soil erosion and sedimentation from construction sites in Victoria (1979)* published by the Soil Conservation Authority.

Where the usage of streets or roads does not warrant full construction and drainage systems, surface drainage should be conveyed by overland flow across grassed areas and thence to natural drainage lines.

39. *Drainage.* Drainage system design shall ensure that erosion of streambeds, streambanks and other drainage lines does not result from the provision of such services and should make allowance, where practical for the attenuation of peak runoff and the retention and trapping of contaminants in runoff. Inputs of these contaminants to the drainage system should be minimised by control of activities within the catchment of the drainage system.

Water Disposal and Waste Generation

40. Disposal of factory effluents to Lake Colongulac

(a) In the case of the Lake Colongulac segment, while the hydrological regime maintains a surface level above Reduced Level 135.7m Australian Height Datum, the limits given in Table 1 for heavy metals and Table 2 for biochemical oxygen demand, suspended solids, turbidity and settleable matter shall not be exceeded in any discharge to the lake.

(b) In the event that the surface level falls below Reduced Level 135.7m Australian Height Datum and where discharge to sewer is not practicable, effluents from factories shall be discharged to land, in such manner that there is no polluted runoff to surface waters in the Policy area. For the indicators biochemical oxygen demand and suspended solids this shall be taken to mean limits in runoff water of 10 g/m³ and 10 g/m³ respectively.

41. *Disposal of solid wastes and sludge to land.* The disposal of wastes to the land surface shall be carried out in such a manner and at such locations as to prevent the pollution of groundwater and surface waters.

42. *Dredging, spoil disposal and other works.* Dredging, reclamation, building and other works should be carried out in a manner which causes minimal disturbance of aquatic plant and aquatic animal habitats. Where practicable, the disposal of dredge spoil shall be on land.

43. *Contingency Plans.* Industries in the Policy area should be encouraged to develop and maintain contingency plans for the management of breakdowns and spillages. Such plans should include:

- (a) actions to minimise the adverse effects;
- (b) emergency holding and cleanup procedures, and
- (c) methods for disposal of spilled materials.

44. *Oil Spillages.* All necessary precautions should be taken to ensure that no oil or grease is spilled into the surface waters of the Policy area.

45. *Land Use.* In the development and administration of land use planning provisions, Responsible Authorities should give consideration to the following:

Changes in use of land should be managed as regards matters such as location and site selection so as to ensure that sediment runoff, both from the site as such and within the catchment as a whole, is reduced to a minimum.

46. *Land Disturbance and erosion.* Land disturbance activities shall be carefully controlled and appropriate soil conservation measures shall be encouraged in order to minimise soil erosion and subsequent runoff of suspended, dissolved and settleable matter.

(a) Construction works should be carried out in accordance with *Guidelines for minimising soil erosion and sedimentation from construction sites in Victoria (1979)* published by the Soil Conservation Authority.

(b) Stock access and urban development bordering stream banks and shores of lakes in the Policy area should be discouraged.

(c) Where bank erosion, substrate disturbance and polluted runoff are evident a vegetated buffer zone should be established along stream banks where necessary to prevent stream bank erosion and to filter polluted runoff. Within these buffer zones urban development should be restricted, land disturbance activities minimised and stock access carefully controlled so as not to conflict with the purpose of such zones.

47. *Agricultural Wastes.* The location and operation of milking sheds, piggeries, poultry farms and cattle feedlots should be in accordance with *Guidelines for the Conduct of Intensive Animal Industries* published by the Department of Agriculture and the Authority. In particular:

No buildings or yard associated with intensive animal industry should be constructed within 100 metres of surface waters.

48. *Rules for Agricultural Waste Disposal.* For the purpose of Section 17(1) of the Act, rules prohibiting and restricting the discharge of waste to the Policy area from farms are hereby made as follows:

- (a) Effluents from milking sheds, piggeries, poultry farms and feedlots shall be disposed of by land irrigation or other treatment in such a manner as to preclude any polluted runoff to surface waters. For the indicators biochemical oxygen demand and suspended solids this shall be taken to mean limits in runoff water at 10g/m³ and 10g/m³ respectively.
- (b) No solid or liquid effluent from intensive animal industry shall be disposed of within 100 metres of surface waters.
- (c) Farm effluents from vegetable washing and processing shall be disposed of by land irrigation or other treatment in such a manner as to preclude any polluted runoff to surface waters. For the indicators biochemical oxygen demand and suspended solids this shall be taken to mean limits in runoff waters of 10g/m³ and 10g/m³ respectively.

49. *Nutrient strategy.* There shall be no significant new input of nutrients nitrogen and phosphorus into any lake.

Related Activities

50. *Research.* Further studies and research should be undertaken by the Authority to assist in the attainment of the Policy including:

- (a) the obtaining of more specific water quality criteria to protect the aquatic ecosystems of the Western District Lakes, particularly in relation to the test species listed as Biological Indicators in Schedules A to I including:
 - (i) the effect of wide variations in salinity on criteria established elsewhere in fresh, marine or estuarine ecosystems.
 - (ii) the threshold concentrations for chronic sublethal effects of toxicants (T).
 - (iii) fish production in inland saline waters.
 - (iv) lethal and optimum growth temperatures.
- (b) further information in relation to levels and sources of contaminants in urban and rural runoff and the development of management methods to reduce these levels, where necessary, with particular emphasis on biochemical oxygen demand, suspended solids, turbidity, pesticides, heavy metals and other toxicants.
- (c) review of the trophic status of the lakes as this relates to the protection of the stated beneficial uses.

51. *Monitoring.* The Authority shall undertake a water quality monitoring programme to ensure that sufficient data are available to assist in the implementation of this Policy and to assess the attainment and maintenance of Policy objectives. This should include at least an annual summer check on the water levels and indicators (particularly salinity) in each study lake together with monthly readings of the level of Lake Colongulac. The reports of such monitoring will be published.

52. *Public Education.* In co-operation with other public and private bodies the Authority shall promote public education in water quality management, waste disposal and pollution control in the Policy area, particularly with respect to the input of waste from non-point sources, and the need for care in the use of toxicants such as pesticides.

Schedule A

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE LAKE PURRUMBETE SEGMENT

Indicator	Objective
1. Dissolved oxygen	Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 85 percent of saturation or 7.5 grams per cubic metre, whichever is higher.
2. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the geometric mean of <i>E. Coli</i> organisms in surface waters of this segment to exceed 200 organisms per 100 mL based on not less than 5 water samples taken within a 42-day period, nor shall more than 20% of these samples exceed 400 organisms per 100 mL.
3. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 0.5 pH units, nor cause such range to be outside the limits of 6.5 to 8.5 at any time nor fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels.
4. Temperature	Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 0.5 degree Celsius above or below ambient temperatures.
5. Salinity	
(a) Salinity	Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed.
(b) Conductivity	Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of salinity as calculated from conductivity of surface waters of this segment to exceed the range 0 to 500 g/m ³ .
6. Light Penetration	
(a) Transmission	No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem.
(b) Secchi Disk	Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of the depth of visibility of a secchi disk to be reduced by more than 10 percent of the normal depth of 4.8 m in this lake except in swimming areas where a secchi disk shall be visible on the bottom.
7. Toxicants	
(a) Toxic Effects	Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures.
(b) Single Toxicants	Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below or Table 3 (whichever is the lower). <ul style="list-style-type: none"> (i) Single Toxicants

The concentration of individual toxicants shall not exceed the levels given by the formula:

$$N + 0.2 (T - N)$$

Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant.

The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment.

In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority.

In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE).

- (ii) Toxicant Mixtures
Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0:

$$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$$

Where C₁, C₂, C_n are the measured or expected concentrations of individual toxicants and L₁, L₂, L_n are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.

8. Nutrients and Biostimulants
(a) General
Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.
- (b) Nitrogen & Phosphorus
Without limiting the generality of objective (a), the concentration of nitrogen and phosphorus should not exceed the following guidance levels:
Total Nitrogen 0.7 g/m³
Total Phosphorus 0.05 g/m³
9. Aesthetic Quality
(a) Odours, Taints & Colours
(i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
(ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 3 to exceed the limits given in the Table.
- (b) Floatable Matter
Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).
10. Settleable Matter
Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones).
11. Suspended Solids
Waste discharges shall not cause the level of suspended solids to exceed 25 g/m³.
12. Biological Indicators
Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
Austrochiltonia subienus (an amphipod)
Anguilla australis (eel)
Galaxias maculatus (common minnow)
Salmo gairdneri (rainbow trout)
Onchorhynchus tshawytscha (chinook (quinnat) salmon)

Schedule B

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE LAKE BULLEN MERRI SEGMENT

- | Indicator | Objective |
|--|---|
| 1. Dissolved oxygen | Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 85 percent of saturation or 7.2 grams per cubic metre, whichever is higher. |
| 2. Bacteria (<i>E. Coli</i>) | Waste discharges shall not cause the geometric mean of <i>E. Coli</i> organisms in surface waters of this segment to exceed 200 organisms per 100 mL based on not less than 5 water samples taken within a 42-day period, nor shall more than 20% of these samples exceed 400 organisms per 100mL. |
| 3. pH | Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 0.5 pH units, nor cause such range to be outside the limits of 6.5 to 8.5 at any time or fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels. |
| 4. Temperature | Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 0.5 degree Celsius above or below ambient temperatures. |
| 5. Salinity
(a) Salinity | Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed. |
| (b) Conductivity | Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of salinity as calculated from conductivity of surface waters of this segment to exceed the range 2500 to 10600 g/m ³ . |
| 6. Light Penetration
(a) Transmission | No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem. |
| (b) Secchi Disk | Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of the depth of visibility of a secchi disk to be reduced by more than 10 percent of the normal depth of 2.6 m in this lake except in swimming areas where a secchi disk shall be visible on the bottom. |
| 7. Toxicants
(a) Toxic Effects | Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological |

- responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures.
- (b) Single Toxicants Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below (whichever is the lower).
- (i) Single Toxicants
The concentration of individual toxicants shall not exceed the levels given by the formula:
- $$N + 0.2 (T - N)$$
- Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant.
- The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment.
- In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority.
- In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE).
- (ii) Toxicant Mixtures
Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0:
- $$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$$
- Where C1, C2, Cn are the measured or expected concentrations of individual toxicants and L1, L2, Ln are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.
8. Nutrients and Biostimulants
(a) General
Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.
- (b) Nitrogen & Phosphorus
Without limiting the generality of objective (a), the concentration of nitrogen and phosphorus should not exceed the following guidance levels:
Total Nitrogen 0.7 g/m³.
Total Phosphorus 0.05 g/m³.
9. Aesthetic Quality
(a) Odours, Taints & Colours
(i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
(ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.
- (b) Floatable Matter
Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).
10. Settleable Matter
Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones).
11. Suspended Solids
Waste discharges shall not cause the level of suspended solids to exceed 25 g/m³.
12. Biological Indicators
Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
Austrochilonia subtenius (an amphipod)
Galaxias maculatus (common minnow)
Onchorhynchus tshawytscha (chinook (quinnat) salmon)

Schedule C

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE LAKE GNUTUK SEGMENT

Indicator	Objective
1. Dissolved oxygen	Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 95 percent of saturation.
2. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the level of <i>E. Coli</i> organisms in surface waters of this segment to exceed 2000 organisms per 100 mL in more than 20 percent of samples taken in a year.
3. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to vary from background level.
4. Temperature	Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary from background level.
5. Salinity	Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level.
6. Light Penetration	
(a) Transmission	No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to vary from background levels.
(b) Secchi Disk	Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of the depth of visibility of a secchi disk to vary from the normal depth of 4.0 m in this lake.
7. Toxicants	The levels of toxicants shall not exceed background levels.
8. Nutrients and Biostimulants	
(a) General	Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.

- (b) Nitrogen & Phosphorus Without limiting the generality of objective (a), the concentration of nitrogen and phosphorus should not exceed the following guidance levels:
 Total Nitrogen 0.7 g/m³
 Total Phosphorus 0.05 g/m³
9. Aesthetic Quality
 (a) Odours, Taints & Colours (i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
 (ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.
 (b) Floatable Matter Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).
10. Settleable Matter The level of settleable matter shall not exceed background levels.
11. Suspended Solids Waste discharges shall not cause the level of suspended solids to vary from background levels.
12. Biological Indicators Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
Haloniscus searlei (an isopod)

Schedule D

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE CUNDARE POOL SEGMENT

Indicator	Objective
1. Dissolved oxygen	Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 75 percent of saturation or 5.5 grams per cubic metre, whichever is higher.
2. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the level of <i>E. Coli</i> organisms in surface waters of this segment to exceed 2000 organisms per 100 mL in more than 20 percent of samples taken in a year.
3. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 1.0 pH units, nor cause such range to be outside the limits of 6.0 to 9.0 at any time nor fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels.
4. Temperature	Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 1.0 degree Celsius above or below ambient temperatures.
5. Salinity	
(a) Salinity	Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed.
(b) Conductivity	Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of salinity as calculated from conductivity of surface waters of this segment to exceed the range 900 to 9900 g/m ³ .
6. Light Penetration	
(a) Transmission	No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem.
7. Toxicants	
(a) Toxic Effects	Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures.
(b) Single Toxicants	Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below or Table 3 (whichever is the lower). (i) Single Toxicants The concentration of individual toxicants shall not exceed the levels given by the formula: $N + 0.5 (T - N)$ Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant. The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment. In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objectives 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority. In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE). (ii) Toxicant Mixtures Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0: $\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$ Where C1, C2, Cn are the measured or expected concentrations of individual toxicants and L1, L2, Ln are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.

8. Nutrients and Biostimulants
(a) General Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.
9. Aesthetic Quality
(a) Odours, Taints & Colours (i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
(ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.
(b) Floatable Matter Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).
10. Settleable Matter Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones).
11. Suspended Solids Waste discharges shall not cause the level of suspended solids to exceed 80 g/m³.
12. Biological Indicators Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
Austrochiltonia subtenuis (an amphipod)
Daphniopsis pusilla (a cladoceron)
Anguilla australis (eel)

Schedule E

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE LAKE CORANGAMITE SEGMENT

- | Indicator | Objective |
|--------------------------------|---|
| 1. Dissolved oxygen | Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 85 percent of saturation or 6.4 grams per cubic metre, whichever is higher. |
| 2. Bacteria (<i>E. Coli</i>) | Waste discharges shall not cause the geometric mean of <i>E. Coli</i> organisms in surface waters of this segment to exceed 200 organisms per 100 mL based on not less than 5 water samples taken within a 42-day period, nor shall more than 20% of these samples exceed 400 organisms per 100 mL. |
| 3. pH | Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 0.5 pH units, nor cause such range to be outside the limits of 6.5 to 8.5 at any time nor fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels. |
| 4. Temperature | Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 0.5 degree Celsius above or below ambient temperatures. |
| 5. Salinity | |
| (a) Salinity | Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed. |
| (b) Conductivity | Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of salinity as calculated from conductivity of surface waters of this segment to exceed the range 22600 to 41000 g/m ³ . |
| 6. Light Penetration | |
| (a) Transmission | No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem. |
| 7. Toxicants | |
| (a) Toxic Effects | Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures. |
| (b) Single Toxicants | Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below (whichever is the lower).
(i) Single Toxicants
The concentration of individual toxicants shall not exceed the levels given by the formula:
$N + 0.2 (T - N)$
Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant.
The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment.
In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority.
In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE).
(ii) Toxicant Mixtures
Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0:
$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$
Where C1, C2, Cn are the measured or expected concentrations of individual toxicants and L1, L2, Ln are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation. |

8. Nutrients and Biostimulants
 (a) General Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.
- (b) Nitrogen & Phosphorus Without limiting the generality of objective (a), the concentration of nitrogen and phosphorus should not exceed the following guidance levels:
 Total Nitrogen 7.3 g/m³
 Total Phosphorus 0.15 g/m³
9. Aesthetic Quality
 (a) Odours, Taints & Colours (i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
 (ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.
- (b) Floatable Matter Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).
10. Settleable Matter Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones).
11. Suspended Solids Waste discharges shall not cause the level of suspended solids to exceed 25 g/m³.
12. Biological Indicators Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
Austrochilonia substanu (an amphipod)
Daphniopsis pusilla (a cladoceran)
Galaxias maculatus (common minnow)
Anguilla australis (eel)

Schedule F

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE LAKE GNARPUR SEGMENT

Indicator	Objective
1. Dissolved oxygen	Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 75 percent of saturation or 5.9 grams per cubic metre, whichever is higher.
2. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the geometric mean of <i>E. Coli</i> organisms in surface waters of this segment to exceed 1000 organisms per 100 mL based on not less than 5 water samples taken within a 42-day period, nor shall more than 20% of these samples exceed 2000 organisms per 100 mL.
3. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 1.0 pH units, nor cause such range to be outside the limits of 6.0 to 9.0 at any time nor fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels.
4. Temperature	Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 1.0 degree Celsius above or below ambient temperatures.
5. Salinity (a) Salinity	Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed.
(b) Conductivity	Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of salinity as calculated from conductivity of surface waters of this segment to exceed the range 5000 to 15100 g/m ³ .
6. Light Penetration (a) Transmission	No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem.
7. Toxicants (a) Toxic Effects	Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures.
(b) Single Toxicants	Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below (whichever is the lower). (i) Single Toxicants The concentration of individual toxicants shall not exceed the levels given by the formula: $N + 0.5 (T - N)$ Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant. The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment. In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority. In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE). (ii) Toxicant Mixtures Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0:

$$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$$

Where C₁, C₂, C_n are the measured or expected concentrations of individual toxicants and L₁, L₂, L_n are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.

- | | |
|--|--|
| 8. Nutrients and Biostimulants
(a) General | Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants. |
| 9. Aesthetic Quality
(a) Odours, Taints & Colours | (i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
(ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table. |
| (b) Floatable Matter | Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones). |
| 10. Settleable Matter | Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones). |
| 11. Suspended Solids | Waste discharges shall not cause the level of suspended solids to exceed 80 g/m ³ . |
| 12. Biological Indicators | Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
<i>Austrochiloptera subienus</i> (an amphipod)
<i>Galaxias maculatus</i> (common minnow)
<i>Anguilla australis</i> (eel) |

Schedule G

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE LAKE COLONGULAC SEGMENT

- | Indicator | Objective |
|--|--|
| 1. Dissolved oxygen | Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 75 percent of saturation or 5.7 grams per cubic metre, whichever is higher. |
| 2. Bacteria (<i>E. Coli</i>) | Waste discharges shall not cause the geometric mean of <i>E. Coli</i> organisms in surface waters of this segment to exceed 1000 organisms per 100 mL based on not less than 5 water samples taken within a 42-day period, nor shall more than 20% of these samples exceed 2000 organisms per 100 mL. |
| 3. pH | Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 1.0 pH units, nor cause such range to be outside the limits of 6.0 to 9.0 at any time nor fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels. |
| 4. Temperature | Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 1.0 degree Celsius above or below ambient temperatures. |
| 5. Salinity
(a) Salinity | Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed. |
| (b) Conductivity | Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of salinity as calculated from conductivity of surface waters of this segment to exceed the range 6100 to 13700 g/m ³ . |
| 6. Light Penetration
(a) Transmission | No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem. |
| 7. Toxicants
(a) Toxic Effects | Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures. |
| (b) Single Toxicants | Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below (whichever is the lower).
(i) Single Toxicants
The concentration of individual toxicants shall not exceed the levels given by the formula:
$N + 0.5 (T - N)$
Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant.
The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment.
In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority.
In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE).
(ii) Toxicant Mixtures
Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0: |

$$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$$

Where C_1, C_2, C_n are the measured or expected concentrations of individual toxicants and L_1, L_2, L_n are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.

8. Nutrients and Biostimulants
(a) General
Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.
9. Aesthetic Quality
(a) Odours, Taints & Colours
(i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
(ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.
(b) Floatable Matter
Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).
10. Settleable Matter
Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones).
11. Suspended Solids
Waste discharges shall not cause the level of suspended solids to exceed 80 g/m³.
12. Biological Indicators
Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
Austrochilonia subienus (an amphipod)
Daphniopsis pusilla (a cladoceran)
Galaxias maculatus (common minnow)
Anguilla australis (eel)

Schedule H

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE LAKE BOOKAR SEGMENT

Indicator	Objective
1. Dissolved oxygen	Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 85 percent of saturation or 7.2 grams per cubic metre, whichever is higher.
2. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the geometric mean of <i>E. Coli</i> organisms in surface waters of this segment to exceed 1000 organisms per 100 mL based on not less than 5 water samples taken within a 42-day period, nor shall more than 20% of these samples exceed 2000 organisms per 100 mL.
3. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 0.5 pH units, nor cause such range to be outside the limits of 6.5 to 8.5 at any time nor fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels.
4. Temperature	Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 0.5 degree Celsius above or below ambient temperatures.
5. Salinity (a) Salinity	Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed.
(b) Conductivity	Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of salinity as calculated from conductivity of surface waters of this segment to exceed the range 9100 to 21500 g/m ³ .
6. Light Penetration (a) Transmission	No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem.
7. Toxicants (a) Toxic Effects	Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures.
(b) Single Toxicants	Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below (whichever is the lower). (i) Single Toxicants The concentration of individual toxicants shall not exceed the levels given by the formula: $N + 0.2 (T-N)$ Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant. The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment. In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority. In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE).

(ii) Toxicant Mixtures

Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0:

$$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$$

Where C₁, C₂, C_n are the measured or expected concentrations of individual toxicants and L₁, L₂, L_n are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.

8. Nutrients and Biostimulants
(a) General

Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.

9. Aesthetic Quality
(a) Odours, Taints & Colours

(i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.

(ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.

(b) Floatable Matter

Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).

10. Settleable Matter

Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones).

11. Suspended Solids

Waste discharges shall not cause the level of suspended solids to exceed 25 g/m³.

12. Biological Indicators

Waste discharges shall not cause the productivity of the following test species to be significantly reduced:

Austrochilonia subtenulis (an amphipod)
Daphniopsis pusilla (a cladoceran)
Anguilla australis (eel)

Schedule I

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE PLAINS LAKES SEGMENT

Indicator	Objective
1. Dissolved oxygen	Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 75 percent of saturation or 5.0 grams per cubic metre, whichever is higher.
2. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the level of <i>E. Coli</i> organisms in surface waters of this segment to exceed 2000 organisms per 100 mL in more than 20% of samples taken in a year.
3. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to be extended by more than 1.0 pH unit, nor cause such range to be outside the limits of 6.0 to 9.0 at any time or fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels.
4. Temperature	Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary more than 1.0 degree Celsius above or below ambient temperatures.
5. Salinity (a) Salinity	Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level to the extent that biological communities characteristic of particular habitats are significantly changed.
6. Light Penetration (a) Transmission	No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to the extent that such reduction would be of detriment to the aquatic ecosystem.
7. Toxicants (a) Toxic Effects	Waste discharges shall not cause the level of toxicants in surface waters of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures.
(b) Single Toxicants	Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below (whichever is the lower.)
	(i) Single Toxicants
	The concentration of individual toxicants shall not exceed the levels given by the formula:
	$N + 0.5 (T - N)$
	Where T is the threshold concentration of chronic sublethal effects for aquatic ecosystems and N is the natural background level of the toxicant.
	The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment.
	In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority.
	In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE).
	(ii) Toxicant Mixtures
	Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0:

$$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$$

Where C1, C2, Cn are the measured or expected concentrations of individual toxicants and L1, L2, Ln are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.

- | | |
|--|--|
| 8. Nutrients and Biostimulants
(a) General | Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants. |
| 9. Aesthetic Quality
(a) Odours, Taints & Colours | (i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
(ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table. |
| (b) Floatable Matter | Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones). |
| 10. Settleable Matter | Waste discharges shall cause no bottom deposits or submerged objects which adversely affect living communities, alter the basic geometry of the lake, present any hazard to boating or adversely affect any other declared beneficial use of this segment. (This objective shall also apply to mixing zones). |
| 11. Suspended Solids | Waste discharges shall not cause the level of suspended solids to exceed 80 g/m ³ . |
| 12. Biological Indicators | Waste discharges shall not cause the productivity of the following test species to be significantly reduced:
<i>Austrochilontia subienus</i> (an amphipod)
<i>Daphniopsis pusilla</i> (a cladoceran) |

Schedule J

WATER QUALITY INDICATORS AND OBJECTIVES FOR SURFACE WATERS OF THE RED ROCK LAKES SEGMENT

Indicator	Objective
1. Dissolved oxygen	Waste discharges shall not cause the concentration of dissolved oxygen in surface waters of this segment to be less than 95 percent of saturation.
2. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the level of <i>E. Coli</i> organisms in surface waters of this segment to exceed 2000 organisms per 100 mL in more than 20 percent of samples taken in a year.
3. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in surface waters of this segment to vary from background level.
4. Temperature	Thermal discharges of any artificial origin shall not cause the temperature of surface waters of this segment to vary from background level.
5. Salinity (a) Salinity	Waste discharges shall not cause the salinity in surface waters of this segment to vary from background level.
6. Light Penetration (a) Transmission	No changes in turbidity, colour, or other factors arising from waste discharges shall reduce the depth of compensation point for photosynthetic activity to vary from background level.
(b) Secchi disk	Without limiting the generality of objective (a), waste discharges shall not cause the guidance level of the depth of visibility of a secchi disk to vary from background level.
7. Toxicants	The level of toxicants shall not exceed background levels.
8. Nutrients and Biostimulants (a) General	Waste discharges shall not add nutrient substances or other growth stimulants to surface waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.
(b) Nitrogen & Phosphorous	Without limiting the generality of objective (a), the concentration of nitrogen and phosphorous should not exceed the following guidance levels: Total Nitrogen 0.7 g/m ³ Total Phosphorous 0.05 g/m ³
9. Aesthetic Quality (a) Odours, Taints & Colours	(i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in surface waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests. (ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.
(b) Floatable Matter	Waste discharges shall cause no visible floating foam, oil, grease, scum, litter or other objectionable matter in waters of this segment. (This objective shall also apply to mixing zones).
10. Settleable Matter	The level of settleable matter shall not exceed background levels.
11. Suspended Solids	Waste discharges shall not cause the level of suspended solids to vary from background levels.

Schedule K

WATER QUALITY INDICATORS AND OBJECTIVES FOR WATERS OF THE GROUNDWATER SEGMENT

Indicator	Objective
1. Bacteria (<i>E. Coli</i>)	Waste discharges shall not cause the geometric mean of <i>E. Coli</i> organisms in waters of this segment to exceed 1000 organisms per 100 mL based on not less than 5 water samples taken within a 42-day period, nor shall more than 20% of these samples exceed 2000 organisms per 100mL.
2. pH	Waste discharges shall not cause the ambient seasonal maximum or minimum pH in waters of this segment to be extended by more than 1.0 pH units, nor cause such range to be outside the limits of 6.0 to 9.0 at any time or fluctuate by more than 2.0 units within any 24 hour period. Total alkalinity shall not decrease below 25% of ambient levels.
3. Salinity	Waste discharges shall not cause the salinity in waters of this segment to vary from background level.

4. Toxicants
- (a) Toxic Effects
- Waste discharges shall not cause the level of toxicants in groundwater of this segment to exceed levels for which there is substantiated evidence of lethal or sublethal toxic effects or undesirable physiological responses in humans, plants, birds, animals, fish or other aquatic life as these relate to the stated beneficial uses of this segment, with due regard to biologically cumulative effects in food chains and the combined effects of toxicant mixtures.
- (b) Single Toxicants
- Without limiting the generality of objective (a), waste discharges shall not cause the level of toxicants to exceed the guidance level derived from sub-clauses (i) and (ii) below or Table 3 (whichever is the lower).
- (i) Single Toxicants
- The concentration of individual toxicants shall not exceed the levels given by the threshold concentration of chronic sublethal effects for aquatic ecosystems (T).
- The threshold concentration (T) for each toxicant may be derived from multigeneration or chronic toxicity tests designed to determine the effects of the toxicant on the physiology, behaviour and reproduction of a sensitive local species approved by the Authority. The results of such tests may be confirmed by biological studies on the survival and productivity of sensitive species in the environment.
- In the absence of data from multigeneration or chronic toxicity tests the threshold concentration (T) may be derived from acute toxicity tests on a sensitive local species specified in Objective 12 or approved by the Authority. In particular, T may be estimated by multiplying the 96 hour LC50 value for sensitive species approved by the Authority by an appropriate application factor specified by the Authority.
- In the absence of toxicity data on suitable local species the toxicant concentrations given in Table 4 may be used as an estimate of T. These shall be known as Interim T Estimates (ITE).
- (ii) Toxicant Mixtures
- Waste discharges shall not cause the levels of toxic materials in combination, as calculated by the following formula, to exceed 1.0:
- $$\frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n} < 1$$
- Where C1, C2, Cn are the measured or expected concentrations of individual toxicants and L1, L2, Ln are the appropriate levels derived from (b) above, for toxicants in isolation. Individual fractions less than 0.2 are not included in the summation.
5. Nutrients and Biostimulants
- (a) General
- Waste discharges shall not add nutrient substances or other growth stimulants to waters in this segment in quantities sufficient to cause excessive or nuisance growths of algae or other aquatic plants or changes in species composition of phytoplankton and other aquatic plants.
6. Aesthetic Quality
- (a) Odours, Taints & Colours
- (i) Waste discharges shall not cause substances producing objectionable odours, taints or colours in waters or edible aquatic organisms of this segment to be present in concentrations detectable by bioassay or organoleptic tests.
- (ii) Without limiting the generality of objective (i) waste discharges shall not cause the concentrations of individual substances listed in Table 5 to exceed the limits given in the Table.
7. Suspended Solids
- Waste discharges shall not cause the level of suspended solids to exceed natural ambient levels.

TABLE 1
Heavy metal limits for
the quality of waste discharges

Heavy Metal	Limit (g/m ³)
Arsenic	0.50
Cadmium	0.10
Chromium (total)	0.30
Copper	0.20
Iron	2.0
Lead	0.10
Manganese	0.5
Mercury	0.005
Nickel	0.50
Silver	0.10
Zinc	0.50

TABLE 2
Suspended solids, settleable matter,
BOD and turbidity limits for the
quality of waste discharges

BOD Limit (g/m ³)	Suspended Solid Limit (g/m ³)	Turbidity Limit (FTU)	Settleable Matter Limit (g/m ³)
80	80	50	nil

TABLE 3

Toxicant limits for the protection
of agricultural water supply

I Stock Watering

Toxicant	Limit
A Metals (g/m ³)	
Aluminium	5.0
Arsenic	0.2
Cadmium	0.01
Calcium	700
Chromium	1.0
Cobalt	1.0
Copper	0.5
Lead	0.1
Magnesium	250
Mercury	.002
Molybdenum	.01
Selenium	.02
Sodium	2000
Vanadium	0.1
Zinc	20.0
B Pesticides (mg/m ³)	
Aldrin	1
Chlordane	3
DDT	50
Dieldrin	1
Endrin	0.5
Heptachlor	0.1
Heptachlor epoxide	0.1
Lindane	5
Methoxychlor	1000
Total Organophosphates and Carbamates	100
Toxaphene	5
2, 4-D	20
2, 4, 5-TP	30
2, 4, 5-T	2
C Radionuclides (pCi/L)	
Radium 226	0.5
Strontium 90	5
Gross α concentration	3
Gross β concentration	30
D Miscellaneous (g/m ³)	
Boron	5.0
Chloride	1000
Fluoride	2
Nitrate & Nitrite (as N)	100
Nitrite (as N)	10
Sulphate	1000
Polynuclear aromatic hydrocarbons	.0002
Carbon Chloroform Extract	
& Carbon Alcohol Extract	0.2
Phenolics	0.002

II Irrigation Supply

Toxicant	Limit
A Metals (g/m ³)	
Aluminium	5.0
Arsenic	0.1
Beryllium	0.1
Cadmium	0.01
Chromium	0.1
Cobalt	0.05
Copper	0.20
Iron	1.0
Lead	5.0
Lithium	0.07
Manganese	0.20
Molybdenum	0.01
Nickel	0.2
Selenium	0.02
Vanadium	0.10
Zinc	2.0
B Miscellaneous (g/m ³)	
Boron	0.7
Fluoride	1.0

TABLE 4

Interim T Estimates (ITE)

Toxicant	ITE (mg/m ³)	
A Metals	(i)	(ii)
Aluminium	200	(x)
Antimony	(x)	(x)
Arsenic	10	(x)
Barium	500	(x)
Beryllium	100	11
Bismuth	(x)	(x)
Cadmium	0.2	0.4
Chromium	50	50.0
Cobalt	(x)	(x)
Copper	10	10.0
Iron	50	1000
Lead	10	30.0
Lithium	(x)	(x)
Manganese	20	(x)
Mercury	0.10	0.05
Molybdenum	(x)	(x)
Nickel	2	100
Silver	1	(x)
Thallium	50	(x)
Uranium	100	(x)
Vanadium	(x)	(x)
Zinc	20	30.0
Other Metals	(x)	(x)

TABLE 4 (cont.)

Toxicant	ITE (mg/m ³)
B Pesticides	(i) & (ii)
Acrolein	(x)
Aldrin	0.001
Allethrin	0.002
Aminocarb	(x)
Aminotriazole	300.0
Azinphosmethyl	0.001
Azinphosethyl	(x)
Benfluralin	(x)
Bensulide	(x)
Captafol	(x)
Carbaryl	0.02
Carbophenothion	(x)
Chlordane	0.01
Chlorfenac	45.0
Chlorothion	(x)
Chloroxuron	(x)
Chloropropham	(x)
Chlorthal	(x)
Coumaphos	0.001
Crotoxyphos	0.1
DDT	0.001
Demeton	(x)
Diazinon	0.009
Dicamba	200
Dichlobenil	37.0
Dichlone	0.2
Dichlorvos	0.001
Dieldrin	0.005
Dioxathion	0.09
Diphenamid	(x)
Diquat	0.5
Disulfoton	0.05
Diuron	1.6
2, 4-D (PGBE)	(x)
2, 4-D (BEE)	4.0
2, 4-D (IOE)	(x)
2, 4-D (Diethylamine salts)	(x)
2, 2-DPA	110.0
Endosulfan	0.003
Endothal (Disodium salt)	(x)
Endothal (Dipotassium salt)	(x)
Endrin	0.002
EPTC	(x)
Ethion	0.02
Fenamosulf	(x)
Fenchlorphos	(x)
Fenoprop (BEE)	2.5
Fenoprop (PGBE)	2.0
Fenoprop (IOE)	(x)
Fenoprop (Potassium salt)	(x)
Fenthion	0.006
Heptachlor	0.001
Lindane	0.01
Malathion	0.008
MCPA	(x)
Methoxychlor	0.03
Mevinphos	0.002
Molinate	(x)
Monuron	(x)
Naled	0.004
Paraquat	(x)
Parathion	0.04
Parathion-methyl	(x)
Phorate	(x)
Pebulate	(x)
Picloram	(x)
Propanil	(x)
Propam	(x)
Propoxur	(x)
Pyrethrum	0.01
Rotenone	10.0
Simazine	10.0
Temephos	(x)
Trichlorophon	0.002
Trifluralin	(x)
Vernolate	(x)

TABLE 4 (cont.)

Toxicant	ITE (mg/m ³)
C Miscellaneous	(i) (ii)
Ammonia (un-ionized)	10 20
Boron	5000 (x)
Bromine (molecular)	100 (x)
Bromate	100 (mg/L) (x)
Chlorine (total residual)	10 2.0
Cyanide (free ion)	5 5.0
Fluoride	1500 (x)
Phenolics	100 100
Phosphorus (elemental)	1 (x)
Polychlorinated biphenyls	1 0.001
Phthalate esters	0.3
Selenium	0.001 10
Sulphides (total)	0.3 2
Surfactants (LAS)	2 200
Radioactivity (gross)	200 p Ci/L 10 pCi/L

(x indicates insufficient information)

TABLE 5

Limits for chemical compounds in water found to cause tainting of the flesh of fish and other aquatic organisms

Chemical	Limit (g/m ³)
acetophenone	0.5
acrylonitrile	18
m-cresol	0.2
o-cresol	0.4
p-cresol	0.12
creylic acids (meta, para)	0.2
n-butylmercaptan	0.06
o-sec. butylphenol	0.3
p-tert. butylphenol	0.03
o-chlorophenol	0.001
p-chlorophenol	0.01
2, 3-dichlorophenol	0.084
2, 4-dichlorophenol	0.001
2, 5-dichlorophenol	0.023
2, 6-dichlorophenol	0.035
2-methyl, 4 chlorophenol	0.075
2-methyl, 6 chlorophenol	0.003
o-phenylphenol	1
2, 4, 6-trichlorophenol	0.003
phenol	1
diphenyl oxide	0.05
β , β -dichlorodiethyl ether	0.09
p-dichlorobenzene	0.25
ethylbenzene	0.25
ethanethiol	0.24
ethylacrylate	0.6
formaldehyde	95
gasoline	.005
kerosene	0.1
kerosene plus kaolin	1
isopropylbenzene	0.25
naphtha	0.1
naphthalene	1
naphthol	0.5
2-naphthol	0.3
dimethylamine	7
α -methylstyrene	0.25
oil, emulsifiable	15
pyridine	5
pyrocatechol	0.8
pyrogallol	20
quinoline	0.5
p-quinone	0.5
styrene	0.25
toluene	0.25
outboard motor fuel,	
as exhaust	0.5
guaiaicol	0.082

And the Honourable William Vasey Houghton, Her Majesty's Minister for Conservation for the State of Victoria, shall give the necessary directions herein accordingly.

TOM FORRISTAL
Clerk of the Executive Council

EXPLANATORY NOTES

Application

On 12 January 1982 the Governor in Council declared a State Environment Protection Policy for the waters of the Western District Lakes. This declaration was made under Section 16 of the *Environment Protection Act 1970*, on the recommendation of the Environment Protection Authority. The Policy covers the surface waters and groundwaters contained within the Lake Corangamite Basin with the exception of the Lake Colac and Woody Yaloak Creek catchments as shown in Fig. 1.

Background

Since the coming into operation on 1 March 1973, of the licensing provisions of the *Environment Protection Act 1970*, environment protection has been exercised by the Authority through sections 20 to 31 of the said Act and having regard to section 39 which, inter alia, states:

... no person shall pollute any waters ... so that the physical, chemical, or biological condition of the waters is so changed as to make ... those waters ... unclean, noxious, poisonous, or impure ... detrimental to health, welfare, safety ... of any beneficial use.

Section 39 has been used to set licence conditions in the Policy area.

The main import of these licences has been to regulate point source discharges into Lake Colongulac from the Camperdown Sewerage Authority treatment works, the Camperdown-Glenormiston Dairying Co. Ltd. factory and Meatpak (Victoria) Pty. Ltd. abattoir. In the absence of any declared Policy specifying acceptable conditions for waste discharges it has been claimed there was insufficient basis for specifying licence conditions; particularly as beneficial uses had not been established nor had the social and economic justification been explored.

Accordingly, the Government directed that this Policy be prepared based on an adequate study of water quality management in relation to the environmental, social and economic needs of the area. That study has now been published and subjected to public review.

As well as addressing the above specific problem the policy provides a basis for future water quality management of all waters in the policy area.

Purpose and Function

The Policy to which these notes refer is a State Environment Protection Policy as provided for in the *Environment Protection Act 1970*. Such a Policy is formulated in draft form by the Environment Protection Authority circulated for public review and comment and, following any necessary revision, recommended for declaration by the Governor in Council.

State Environment Protection Policy is an official declaration by the Government of Victoria of the kind and level of protection to be accorded to the environment. A Policy may relate to the environment in general or to some element or segment of the environment. Thus, Policies may be declared for air, water, land or noise or for a combination of these elements. They may encompass the whole State of Victoria or some particular area or areas within the State.

Such policies provide a statutory basis for all decision making in regard to environment protection and pollution control. All licensing of waste discharges must be in accord with the objectives defined in declared Policies. All Regulations made in relation to pollution control must be framed in the light of these objectives.

There are three main features of a State Environment Protection Policy:

1. Beneficial Uses

A Policy sets forth "beneficial uses" of the environment to be protected, i.e. ways in which the public derive benefit or enjoyment from the environment and which need protection from the effects of waste discharges or noise.

2. Quality Objectives

The beneficial uses determine the level of environmental quality that must be achieved and maintained. If a waterway is to be pro-

ected for the purpose of swimming, the water quality obviously needs to be higher than in the case where it is to be protected as a watering place for stock. The quality objectives in a Policy constitute the level of environmental quality that is needed to protect the beneficial uses.

3. Attainment Programme

As far as possible, a Policy does not rest content with defining quality objectives, but also outlines a practical programme whereby the objectives can be achieved and maintained. The requirements set forth in the attainment programme are to be implemented by government agencies such as the EPA.

The Policy

In order to protect beneficial uses in the Policy area this Policy seeks to maintain existing water quality in the lakes of the Western District and to upgrade water quality as regards organic pollution of Lake Colongulac.

The Policy area is divided into eleven segments based on the beneficial uses to be protected in each case. See Figure 1 accompanying the Policy.

- A Lake Purrumbete segment
- B Lake Bullen Merri segment
- C Lake Gnotuk segment
- D Cundare Pool segment
- E Lake Corangamite segment excluding catchment
- F Lake Gnarpurt segment
- G Lake Colongulac segment
- H Lake Bookar segment
- I Plains Lakes segment including Lake Corangamite catchment
- J Red Rock Lakes segment
- K Groundwater segment

A summary of the beneficial uses protected in each segment is given in Table E1. Existing and potential uses were intensively studied in formulating these recommendations.

TABLE E1
BENEFICIAL USES PROTECTED

Segment	A	B	C	D	E	F	G	H	I	J	K
<i>Beneficial Use</i>											
AGR Agricultural water supply Class 1—Farmstead supply Class 2—Stock water supplies Class 3—Irrigation water	•	•	•	•	•	•	•	•	•	•	•
REC Recreation Class 1—Primary contact Class 2—Secondary contact Class 3—Passive	•	•	•	•	•	•	•	•	•	•	•
PRO Production of Edible Fish	•	•	•	•	•	•	•	•	•	•	•
ECO Maintenance and Preservation of Aquatic Ecosystem and Associated Wildlife	•	•	•	•	•	•	•	•	•	•	•
FOR Maintenance and Preservation of Foreshore Vegetation	•	•	•	•	•	•	•	•	•	•	•
SCI Scientific and Educational	•	•	•	•	•	•	•	•	•	•	•
IND Industrial Water Supply —Sand Washing						•					

Water Quality Objectives

Water quality indicators and objectives have been specified for each segment on the basis of the most limiting beneficial use for each indicator, i.e. the beneficial use that imposes the most stringent water quality requirements with respect to the indicator.

Different beneficial uses can mean different quality objectives. For example, in lakes such as Bookar and Colongulac, since swimming is not a protected use, the quality objective in terms of *E. Coli* is 1000 organisms per 100 ml, whereas if swimming is protected the objective is 200 organisms per 100 ml.

The main difference however, is in the degree of protection afforded to the aquatic ecosystem in each lake. Water quality objectives need to be closely related to the background or ambient levels but the extent of variation permitted differs with the level of protection:

Level I This degree of protection (very high) is afforded to Lake Gnotuk and the Red Rock Lakes and no variation to background levels is permitted.

Level II A high degree of protection is specified for Lakes Purumbete, Bullen Merri, Corangamite (excepting its catch-

ment) and Bookar. Limited variation from background is permitted, e.g. ± 0.5 pH units, ± 0.5 degrees Centigrade.

Level III A moderate degree of protection applies to the Cundare Pool, Lakes Gnarpurt and Colongulac and the Plains Lakes and other surface waters of the Lake Corangamite catchment. Variations from backgrounds are wider than Level II, e.g. ± 1.0 pH units, ± 1.0 degrees Centigrade.

Level IV or minimal protection is not recommended for any lake.

Table E2 summarises the water quality objectives for each segment.

TABLE E2
SUMMARY OF WATER QUALITY OBJECTIVES

Objective	Indicator	Unit	Segment A Lake Purumbete	Segment B Lake Bullen Merri	Segment C Lake Gnotuk	Segment D Cundare Pool	Segment E Lake Corangamite	Segment F Lake Gnarpurt	Segment G Lake Colongulac	Segment H Lake Bookar	Segment I Plains Lakes	Segment J Red Rock Lakes	Segment K Ground Water
1.	Dissolved Oxygen—saturation concentration	%	> 85	> 85	> 85	> 75	> 85	> 75	> 75	> 85	> 75	> 95	—
2.	Bacteria <i>E. Coli</i> —mean	org/100 mL	< 200	< 200	< 200	< 200	< 200	< 1000	< 1000	< 1000	< 2000	< 2000	< 1000
3.	20% of samples	org/100 mL	< 400	< 400	< 400	< 2000	< 400	< 2000	< 2000	< 2000	< 2000	< 2000	< 2000
4.	pH extension (a)	Units	0.5	0.5	0.5	1.0	0.5	1.0	1.0	0.5	1.0	Nil	1.0
5.	Temperature—variation	Units	6.5–8.5	6.5–8.5	6.5–8.5	6.0–9.0	6.5–8.5	6.0–9.0	6.0–9.0	6.5–8.5	6.0–9.0	b/ground ambient	6.0–9.0
6.	Salinity—guidance	g/m ³	0 to 500	0 to 500	0 to 500	1.0	0.5	1.0	1.0	0.5	1.0	b/ground only	b/ground only
7.	Light Penetration—secchi depth	m	±0.48	±0.26	±0.40	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)
8.	Toxicants—guidance level	Formula (c)	N+0.2 (T–N)	N+0.2 (T–N)	N	N+0.5 (T–N)	N+0.2 (T–N)	N+0.5 (T–N)	N+0.5 (T–N)	N+0.2 (T–N)	N+0.5 (T–N)	N	N
9.	Nutrients and Biostimulants—total nitrogen	g/m ³	0.7	0.7	0.7	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)
10.	Aesthetic Quality—odours, taints, colours	Qual	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)
11.	Settleable Matter	Qual	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)
	Suspended Solids	g/m ³	25	25	25	80	25	80	80	25	80	Nil	b/ground

NOTES

(a) Extension of ambient maximum/minimum to be less than units specified, also 24 hour fluctuations less than 2.0 units and alkalinity not to be more than 25%.

(b) No reduction in light penetration detrimental to aquatic ecosystem.

(c) Formula as specified where N equals natural background level, T equals threshold concentration of chronic sublethal effects (estimated level, ITE, or Tables 4 and/or 5) fractions of measured/appropriate levels is less than 1.0.

(d) No excess or nuisance growths of aquatic plants.

(e) No objectionable odour taints or colours (Table 6).

(f) No visible floating foam, oil, grease, scum, litter or other objectionable matter.

(g) No adverse effect on bottom living communities.

(h) No objectionable odour taints or colours (Table 6).

(i) No visible floating foam, oil, grease, scum, litter or other objectionable matter.

(j) No adverse effect on bottom living communities.

(k) No objectionable odour taints or colours (Table 6).

Attainment Programme

The attainment programme consists of two parts—general provisions and detailed provisions. The general provisions are an outline of the management means required to implement the Policy, and provide a basis for more detailed implementation plans. The detailed provisions are a forerunner of implementation plans which highlight water quality management problems and outline mechanisms and actions for their solution. Those actions which can be identified from the start as necessary for the achievement of the Policy are already included in the detailed provisions of the attainment programme.

The major water quality problems addressed in the Policy are related to the fact that all the lakes (except Purrumbete) are formed in closed drainage basins. Over time, salts have accumulated in the lakes elevating their salinities. Aquatic organisms have adapted to these conditions but are sensitive to further stresses such as: reduction in dissolved oxygen levels caused by organic wastes; alteration to the temperature or pH regime; changes in light penetration and turbidity or the addition of toxicants to the lakes.

Other concerns are the possible health risks associated with high *E. Coli* levels, the maintenance of the aesthetic quality of the lakes and avoidance of excessive biostimulation from high levels of nutrients.

The *E. Coli* levels have been high in Lake Colongulac. This is largely due to town sewage. These levels must be lowered if, as the policy proposes, secondary contact recreation is to be protected. First of all, adequate sewerage facilities must be provided and maintained. (Clause 35). Secondly, even where sewerage exists, urban drainage contributes significantly to bacterial levels in surface waters. For this reason, it will be necessary (especially in the case of streams that provide little dilution for urban drainage) to take further measures, including the elimination of unauthorised discharges to the drains, repairs to leaking sewers and improvements in street cleaning methods. (Clause 39).

There are high levels of nutrients (phosphorus, in particular in Lake Colongulac), chiefly as a result of discharges from sewage plants and runoff from agricultural land. In the clear, deep, maar lakes, this would be cause for concern because high levels of phosphorus and nitrogen can lead to excessive growth of algae and other aquatic plant life and thereby prove detrimental to many beneficial uses, including the maintenance of ecosystems and recreational uses. However, in the shallow, turbid lakes on the volcanic plains, such as Lake Colongulac, nutrients are less of a concern but may cause problems in exceptional climatic situations. Thus a policy of no further increase in nutrient loads is recommended. (Clause 49). Disposal of sewage and factory wastes to land would considerably reduce the inputs of nutrients in urban areas (Clause 37). In rural areas runoff from intensive animal industries must conform to guidelines published jointly by the EPA and the Department of Agriculture (Clauses 47 & 48).

Control of the level of suspended solids and therefore excessive turbidity calls for a co-ordinated management programme, including measures such as avoidance of erosion in drainage systems (Clause 39), location and management of land use to reduce sediment runoff (Clause 45), compliance with guidelines for construction works (Clauses 38 and 46a), the setting of maximum licence limits (Clause 34) and the establishment of buffer zones where there is evidence of disturbance along lake foreshores and stream banks (Clause 46b).

Heavy metals, if disposed of to the lakes, would pose a threat to aquatic life. Clause 33 of the Policy limits the concentrations of heavy metals permissible in discharges whilst other measures will reduce the effects of heavy metals in urban runoff.

Pesticides also warrant close attention, especially in view of the fact that they are applied widely and heavily in intensive agriculture, are being increasingly used in urban gardens and can affect aquatic life even in very low concentrations. Since little information is available on the levels and sources of pesticides in the streams of the Policy area, this is listed in Clause 50 as one of the areas which the Authority needs to research further.

Other measures called for in the Policy include continued implementation of the EPA licensing system (Clause 26); an ongoing monitoring programme to assist in the implementation of the Policy and to assess the attainment and maintenance of its objectives (Clause 51); very strict limits on discharges to groundwater, the Red Rock Lakes and Lake Gnotuk (Clauses 30–32); disposal of wastes on land in such a way and at such places as to preclude any contamination of surface waters or groundwaters (Clause 41); and precautionary measures to avoid discharges of oil and grease (Clause 44) together with encouragement to industries to develop contingency plans for cases where breakdowns and spillages do occur (Clause 43).

Another feature is that for some indicators (heavy metals, biochemical oxygen demand, suspended solids, turbidity and settleable solids) the attainment programme specifies the maximum licence conditions which are to apply in order to achieve the objec-

tives. Although in particular lakes more stringent conditions may apply, these discharge limits can be used as a guide for prospective discharges.

After declaration of the Policy by the State Government, the various guidelines and directives apply to all agencies involved in or affecting water quality management in the Policy area. Several of the guidelines will need to be implemented by authorities other than the EPA. For example, the provision of sewerage is administered by the Camperdown Sewerage Authority and the State Rivers and Water Supply Commission. Responsibility for erosion control rests primarily with the Soil Conservation Authority, land use provisions with land use planning agencies, street construction with local Government and so on.

Costs and benefits of the policy

The benefits of the Policy are to improve and maintain water quality in the Policy area in order to protect the recognised beneficial uses of the water. Non-implementation of the Policy will result in a poorer environment both in terms of the uses which can be made of the lakes and in terms of the aesthetic values attached to them.

The beneficial uses which are most at risk in the absence of the Policy are:

- Aquatic Ecosystems and Associated Wildlife (all lakes)
- Aesthetic Enjoyment, nature study and sightseeing—(all lakes)
- Swimming (Lakes Purrumbete, Bullen Merri and Corangamite)
- Agricultural Water Supply (Lake Purrumbete)
- Recreational Fishing (Lakes Purrumbete, Bullen Merri, Corangamite, Gnarpurt and Colongulac)
- Commercial Fishing (Lakes Purrumbete, Cundare Pool, Lakes Corangamite, Gnarpurt, Colongulac and Bookar)
- Wading and Boating (Lakes Purrumbete, Bullen Merri, Corangamite, Gnarpurt, Colongulac and Bookar).

The most significant costs envisaged for industry are as follows:

- Land application of all types of waste is seen as a significant Policy requirement although while there is sufficient water in Lake Colongulac, disposal of treated effluent can continue, in line with present licence conditions. Estimated annual costs to the factories of achieving a moderate level of protection range from \$142 000* to \$177 000 per annum for the Camperdown-Glenormiston Dairying Co. Ltd. factory to \$54 000 per annum for Meatpak (Victoria) Pty. Ltd. In the former instance, these costs could reduce returns to producers by 1 per cent (i.e. by 1.5c/kg of butterfat).
- Improvements in industry "housekeeping" and in the storage and handling of hazardous materials will be needed in order to reduce contaminated runoff.
- The contingency plans that are encouraged may require measures such as the construction of bunkers around places where hazardous materials are stores.

The consequences of the Policy for servicing authorities are largely a continuation of current practice:

- Efforts are required to ensure that all houses are connected to sewerage in areas where this is available.
- Authorities undertaking, supervising or approving construction, land development, drainage and servicing works would need to ensure that necessary methods for minimising sediment runoff are implemented.
- In siting and managing tips for municipal wastes, care must be taken that there is no contamination of groundwater and that any leachate generated can be contained and treated on site.

The consequences of the Policy for agriculture are also largely a continuation of current practice:

- Good farming practice with respect to fertiliser application, pesticide application and tillage and cropping techniques need to be consistently applied.
- Wastes from intensive animal farming and vegetable processing need to be disposed of by land application.
- Vegetated buffers in which stock access and cropping would be controlled are encouraged along lake foreshores and streams. This would apply particularly to locations where bank erosion problems already exist and to Crown Land where alternative land management was available.

The implications of the Policy for land use planning are:

- Controls on servicing of urban areas, rural/residential development. Guidelines for intensive agriculture and agriculture.
- The setting aside of buffer zones along lake foreshores and significant drainage lines.

The implementation of the Policy commits the State Government to expenditure for monitoring and implementation activities. This

expenditure is additional to the costs involved in providing services and in waste discharge licensing activities.

A monitoring programme for the catchment will cost approximately \$10 000 pa and another amount of up to \$10 000 pa could be envisaged for consultant projects and laboratory and equipment costs associated with special purpose studies and research.

While it is recognised that implementing the Policy involves significant costs and consequences for both the public and private sectors, costs should never be considered in isolation from benefits, which, in this case are beneficial uses that are of value not only to the existing population but to the generations still to come. In arriving at the Policy recommendations, special attention has been given to defining the importance that the various groups which comprise the community attach to goals for protection of the environment.

Local government, state government, rural, manufacturing and business interests, residents, recreation and sport conservation and historical and scientific interests were all separately consulted.

The evaluation revealed a general community consensus for all lakes except Lake Colongulac. This lake was studied in more detail than others and the consequences of waste discharges evaluated for the situation in dry years where the water level could drop. The economic impact of waste treatment costs on dairy farmers is given above as approximately 1.5c/kg butterfat which is about 1 per cent of typical farm income from milk. In the case of the abattoir, the costs are tolerable and would not significantly affect the operation. It is believed that the Policy provides a fair balance between protecting important goals and minimizing the impact.

* 1980 costs quoted throughout.