



Regional Directions for Irrigation Development: Regional Irrigation Development Guidelines

Northern Victoria

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Foreword

Irrigation accounts for more than 75% of water use in Victoria. It generates substantial economic, social and regional benefits. The Victorian Government's White Paper 'Securing Our Water Future Together' states the Government's aspiration for irrigation is for it to become increasingly productive with minimal environmental impact. To ensure that irrigation development proceeds in a sustainable manner, it must be assessed against Regional Irrigation Development Guidelines.

Regional Irrigation Development Guidelines will comprise four key documents: Regional Directions for Irrigation Development; Agency Operational Procedures; Memorandum of Understanding and Irrigation Development Information Pack.

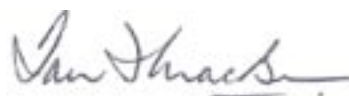
This document, the Regional Directions for Irrigation Development, is based on experience and use of the 'Irrigation Development Approval Process Guidelines' adopted by Goulburn-Murray Water and applied in the North Central, Goulburn Broken and North East catchment regions, first introduced in 1998. The Regional Directions for Irrigation Development take into account water-use licences and higher standards for irrigation development and will guide irrigation development approval in the North East, Goulburn Broken and North Central Catchment Management Authority regions.

Further, the Regional Directions for Irrigation Development will support and where practicable refer to other legislation that informs irrigation development - namely the Water Act and the Waters of Victoria State Environment Protection Policy.

Regional Irrigation Development Guidelines will minimise risk associated with applying water to land and impact of irrigation on natural and built assets. Much of the Regional Irrigation Development Guidelines are about risk management and indeed the approval process is founded on a multi-level risk assessment process.

The Regional Irrigation Development Guidelines will ensure improved water-use efficiency through application of higher standards while also providing for protection and enhancement of biodiversity and heritage values.

This document sets the framework, principles and conditions under which irrigation development will be approved. Process and methodology developed to support the Regional Directions for Irrigation Development may vary from catchment to catchment and will be underpinned by Agency Operational Procedures and Memorandum of Understanding. The successful delivery of the Guidelines will rely on a catchment partnership approach between key agency partners including Catchment Management Authorities, Department of Sustainability and Environment, Department of Primary Industries, Rural Water Corporation, local government and the community.



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I. Key Purpose

I.1 Statewide Advisory Note for Irrigation Development Guidelines

The key purpose of the Statewide Advisory Note for Irrigation Development Guidelines is to minimise the adverse side effects of irrigation on the Victorian natural resource base and third parties. Conditions reflecting these standards will be required for irrigation developments.

In the case of the redevelopment of existing operations, which do not trigger the Regional Irrigation Development Guidelines approval process, it is not feasible to expect a proponent to meet higher irrigation standards. In fact a requirement to do so could act as an impediment for irrigation farm redevelopment and associated improvements. Rather continuous improvement towards best practice is expected.

I.2 Regional Irrigation Development Guidelines

Catchment Management Authorities have been asked by the Minister for Water to develop Regional Irrigation Development Guidelines. Their key purpose is to complement the Statewide Advisory Note for Irrigation Development Guidelines and provide consistency, accountability and clarity to approving irrigation development at a regional level.

The Regional Irrigation Development Guidelines will comprise and be implemented through the establishment of four aligned documents:

- i) Catchment Management Authority and Rural Water Corporation approved **Regional Directions for Irrigation Development**: this document provides the head of power and authority for agencies to administer the Regional Irrigation Development Guidelines.
- ii) **A Memorandum of Understanding**: signed by Department of Primary Industries, Department of Sustainability and Environment, Rural Water Corporation and the relevant Catchment Management Authority detailing the responsibilities, processes and commitments required of all government agencies to efficiently and effectively administer the Regional Irrigation Development Guidelines.
- iii) **Agency Operational Procedures**: individual mutually agreed detailed processes and procedures for each agency based on a multi-level risk based approach.
- iv) **Irrigation Development Information Pack**: a clear and concise document for the proponent, detailing the requirements and approval processes necessary for irrigation development.



2. Legislative Basis of Regional Irrigation Development Guidelines

This document, the Regional Directions for Irrigation Development, details processes by which conditions are set for ‘water-use licences’ (granted under Section 64 of the Water Act 1989) and ‘works licences’ (issued under Section 67).

2.1 Water-Use Licence

A water-use licence is an authority, with conditions, to use water for the purposes of irrigation on the land specified in the licence. The primary purpose of water-use licences is to minimise the impacts of water-use upon other persons and the natural resource base.

2.2 Works Licence

Under Section 67, a person may apply to the Minister for Water to issue a licence to construct, alter, operate, remove or decommission a bore or any works on a waterway (including the River Murray), including works to deviate (temporarily or permanently) a waterway.

2.3 Other Legislation

In most cases, the Water Act is the governing legislation, however, where reclaimed water is used for irrigation the Waters of Victoria State Environment Protection Policy will take precedence in accordance with Environmental Protection Authority requirements.

3. Where and when do Regional Irrigation Development Guidelines apply?

Regional Irrigation Development Guidelines apply to the Goulburn Broken, North Central and North East Catchment Management Authority regions. In developing the Regional Irrigation Development Guidelines, Catchment Management Authorities have worked in partnership to develop a suite of consistent guidelines to manage irrigation development across northern Victoria.

As at 1 July 2007 all regulated surface water Section 51 Diversion Licences and Water Rights in irrigation districts will be unbundled to a water-use licence, which is granted under Section 64 of the Water Act. At this time, groundwater and unregulated surface water diversion licences will remain bundled as Section 51 “Take and Use Licences”.

In summary, the Regional Irrigation Development Guidelines apply to:

Regulated Surface Water (Unbundled)	Unregulated Surface Water and/or Groundwater (Bundled)
* Water-Use Licence	* Works Licence
* Works Licence	

Note: At the time of preparing Regional Irrigation Development Guidelines, there were no ‘policies for managing Section 51 Take and Use Licences’. These policies are under development and when available, will be reviewed and incorporated into Regional Irrigation Development Guidelines as appropriate.

3.1 Water-Use Licence

Regional Irrigation Development Guidelines apply to applications for, or variations to, water-use licences for irrigation purposes where the proposed irrigation development:

1. Will occur on land for which there has never been a water-use licence.
2. Involves an increase in the annual use limit in an existing water-use licence.
3. Involves an increase in the area allowed to be irrigated in an existing water-use licence.

3.2 Works Licence

Regional Irrigation Development Guidelines apply for all Section 67 applications for a new works licence, or the renewal or varying of an existing works licence for irrigation purposes

3.3 When do the Regional Irrigation Development Guidelines not apply?

Regional Irrigation Development Guidelines do not apply:

- where a water-use licence is cancelled under Section 64S(2) of the Water Act because part of the land to which it refers is transferred to a different party – new licences may be issued for each part of the land without the imposition of any extra conditions, provided that each licence has an appropriate share of the previous annual use limit and the sum of the new annual use limits is no greater than the previous annual use limit.
- Where irrigation is to be extended to some new land but will be within the annual use limit of the existing licence – licences created by conversion in an irrigation district will apply to the whole of each property - extensions in land area that are judged by the Minister for Water to be minor can be covered by a licence variation without the imposition of any additional conditions.

- Where irrigation is to be intensified on some land already covered by a licence and an increase in the annual use limit in the licence is sought – there will be modifications, as are judged by the Minister for Water to be reasonable in the circumstances, bearing in mind the water-use objectives.



4. Principles

The key principles that have been applied in the development of the Regional Irrigation Development Guidelines include:

- The Regional Irrigation Development Guidelines should provide for certainty, clarity and ease of process for proponents, Government agency staff and Local Government
- The Regional Irrigation Development Guidelines should provide for the Government's irrigation water-use objectives to be met
- Irrigation development should only proceed on a sustainable basis
- Standards reflecting best irrigation practice should be met for new development
- The onus is on the proponent to demonstrate the impacts and potential impacts of the proposal, the means by which any impacts are to be mitigated and compliance with Regional Irrigation Development Guidelines
- Multi-staged risk based approach be used to ensure that an appropriate level of assessment is conducted to meet the risks identified
- Single entry point to process to assist proponents
- Single referral point of contact provided by agencies to provide clarity on who is responsible at each stage of the process
- Issuing of works licences shall be aligned with this process as will approvals based on Native Vegetation, Heritage and Environmental Assessment and Local Government requirements
- Irrigation development approval process shall ensure the proposed development is compatible with Reconfiguration Plans
- Cost to proponent will vary and will reflect the level of assessment required to gain irrigation development approval
- The Regional Irrigation Development Guidelines will be subject to an agreed process of regular review and updating to enable a change in standards, focus and imperatives



5. Objectives of Regional Directions for Irrigation Development

The aim of this document is to provide the Minister for Water confidence in directions for Regional Irrigation Development Guidelines, alignment with water-use objectives and demonstrate a risk-based approach to approving irrigation development.

5.1 Water-Use Objectives

There are five specific matters listed in the legislation for which the Minister for Water can set Water-Use Objectives. They are:

- Managing groundwater infiltration
- Managing disposal of drainage
- Minimising salinity
- Protecting biodiversity
- Minimising cumulative effects of water use

5.1.1 Managing groundwater infiltration

In placing conditions on water-use licences in order to manage groundwater infiltration, the delegated Authority must aim to: *Limit infiltration to groundwater systems arising from irrigation so as to minimise or avoid waterlogging, land salinisation, water salinisation and groundwater pollution.*

Groundwater infiltration is the dominant driver of land and water salinisation within irrigation districts. To address this, water-use licences will establish annual use limits per hectare of irrigated land. In setting the annual use limits consideration must be given to crop requirements, drainage systems and drainage re-use, and the need for vertical drainage to flush salt accumulation.

5.1.2 Managing disposal of drainage

In placing conditions on water-use licences in order to manage the disposal of drainage, the delegated Authority must aim to: *Control the disposal of drainage from irrigation so as to minimise or avoid waterlogging, salinising or eutrophying waterways, wetlands, native vegetation, native animal habitats, groundwater and other persons' property.*

Where a development is not part of a coordinated drainage scheme, the Government requires the proponent to take individual responsibility for ensuring that any drainage water produced does not damage the natural resource base. In such cases the water-use licence will specify conditions relating to drainage disposal and measures to mitigate environmental impacts. The Government will support an audit and compliance initiative to ensure those licence conditions in regards to drainage and environmental protection are met. Proponents will be fully responsible for the cost of remedial works if conditions have not been met, and in the case that environmental impacts are found, remedial actions taken.

Where there is approval for the development to be incorporated into a coordinated drainage scheme, it is the proponent's responsibility to ensure that drainage water is disposed via the coordinated drainage scheme.

The water-use licence may specify drainage contingencies, monitoring and reporting requirements and remedial actions.

5.1.3 Minimising salinity

In placing conditions on water-use licences in order to minimise salinity, the delegated Authority must aim to: *Ensure that licence-holders are responsible for the full costs of any necessary offsetting works where limits on groundwater infiltration and controls on drainage disposal are not sufficient to manage identified risks to land or water salinisation.*

The Government aims to ensure that where salinisation of waterways cannot be avoided, the proponent will be responsible for meeting the cost of offsetting works. Where there is a reasonable probability that an irrigation development will result in material salinisation of a waterway, the development will either not be able to proceed or the proponent will be required to meet the costs of any offsetting works.

5.1.4 Protecting biodiversity

In placing conditions on water-use licences in order to protect biodiversity, the delegated Authority must aim to: *Set corrective action thresholds and corrective action procedures where limits on groundwater infiltration and controls on drainage disposal are not sufficient to manage identified risks, associated with water use, to specific wetlands, native vegetation stands, or native animal habitats.*

The Government aims to bring about protection and enhancement in biodiversity including a net gain in the extent and quality of native vegetation. Irrigation development is required to comply with Victoria's Biodiversity Strategy and the Native Vegetation Management Framework. The Regional Irrigation Development Guidelines will provide a link to procedures and policies relevant to the protection and enhancement of native vegetation and to the broader protection of fauna, threatened species and wetlands. The Regional Irrigation Development Guidelines should provide a process to facilitate and ensure compliance with these requirements.

Irrigation developments can pose a direct and on-going risk to wetlands, remnant vegetation, fauna, and threatened species through clearance, salinisation, waterlogging and water quality issues. In these instances, the Rural Water Corporation in consultation with the Catchment Management Authority, Department of Sustainability and Environment and local government may write specific conditions into a water-use licence in due course.

5.1.5 Minimising cumulative effects of water use

In placing conditions on water-use licences in order to minimise the cumulative effects of water use, the delegated Authority must aim to: *Ensure the combined impact of a series of individually acceptable increases in water use within defined boundaries is not greater than the sum of the individual impacts on other persons and the environment.*

The Government aims to ensure that the effect of small incremental decisions do not undermine its biodiversity, infiltration of groundwater, and drainage disposal water-use objectives.

The history of irrigation demonstrates that well managed, isolated, small-scale irrigation enterprises may cause little environmental damage. It also demonstrates that the larger-scale, more intensive irrigation, resulting from a cluster of such properties can pose significant threats to biodiversity protection, infiltration to groundwater and responsible drainage disposal.

The Government seeks to build review mechanisms into water-use licences to take account of these changing pressures. Therefore, the cumulative effect conditions of water-use licences will specify the trigger for conducting these reviews. The trigger may nominate the sum total of annual use limits that can be approved within a designated area without a review.

The review may also identify that because of the clustering of irrigation development, it is appropriate for a coordinated drainage scheme to be implemented.

6. Water-Use Licence Conditions

6.1 Standard Conditions for Existing and New Water-Use Licences

All water-use licences that are current on 1st July 2007 and all new water-use licences created after 1st July 2007 are subject to the following standard conditions to meet the set water-use objectives:

6.1.1 Managing groundwater infiltration

- Water used for the purposes of irrigation on the land specified in the licence must be measured through a meter approved by a Water Corporation unless the Water Corporation has granted an exemption in writing.
- Ponded irrigation (ie. rice) must not be carried out on the land specified in the licence without the addition of particular conditions governing the use of such an irrigation system.

6.1.2 Managing disposal of drainage

- Where irrigation results in drainage from the land specified in the licence, that drainage water must be disposed in ways that meet with the standards, terms and conditions adopted from time to time by the Water Corporation.

6.2 Additional conditions for Water-Use Licences subject to the Regional Irrigation Development Guidelines

Additional conditions apply for water-use licences subject to the Regional Irrigation Development Guidelines.

These additional conditions are included on an endorsed Irrigation and Drainage Plan, or in some catchments, a local government certified whole farm plan.

6.2.1 Managing groundwater infiltration

Conditions specific to each Catchment Management Authority are prescribed in Appendix 2.

6.2.2 Managing disposal of drainage

- Where irrigation results in drainage from the land specified in the licence, water may only be used for irrigation while that drainage water is disposed of in accordance with the arrangements specified in the endorsed irrigation and drainage plan and with any terms and conditions that apply to a drainage service that is employed.

6.2.3 Minimising salinity

- Where the endorsed irrigation and drainage plan identifies that the quality of the water being used for irrigation poses significant risk of salt accumulating in the irrigated soil, water may only be used for irrigation if its electrical conductivity lies within the range specified in the endorsed irrigation and drainage plan.
- Where the endorsed irrigation and drainage plan shows that all or part of the land being irrigated is within a 'salinity impact zone,' and where the Minister for Water, under Section 287A of the Water Act has given notice in writing requiring the owner to make a payment or payments towards the cost of works or measures to off-set any impact on river salinity, water may only be used for irrigation while the payments are being made as required in the notice.



6.2.4 Protecting biodiversity

- Where the endorsed irrigation and drainage plan identifies that the use of water for irrigation poses direct and ongoing risks to wetlands, native vegetation, or the habitat of native animals, water may only be used for irrigation while the licence holder meets the relevant monitoring and correctional requirements specified in the plan with regard to:
 - installing and maintaining the specified monitoring equipment;
 - following the specified data reading, recording, reporting and auditing requirements; and
 - carrying out the specified corrective action procedures, within the specified time, where a specified threshold for these is breached.

7. Works Licence Standard Conditions

All works licences for irrigation purposes that are created after 1st July 2007 are subject to the following standard conditions:

7.1 Extraction share

- Water can only be taken through the works referred to in the works licence if in a period of rationing or other restriction, it is taken in accordance with the share of the flow represented by the specified extraction share.
- Where an approved siting, construction, operation and maintenance plan or “works plan” is recorded in the water register, water can only be taken through those works if it is not extracted faster than the maximum instantaneous rate, the maximum daily rate, the maximum weekly rate or the maximum monthly rates specified in the endorsed works plan.
 - Water taken through the works must be taken through a Water Corporation meter unless the delegated Water Corporation has granted an exemption in writing.
 - Meters used for the purpose of this licence are deemed to be the property of the Water Corporation.
 - The licence holder must at all times provide the Water Corporation with safe access to Water Corporation-owned meters for the purpose of reading, calibration or maintenance.
 - The licence holder must notify the Water Corporation within five business days if the Water Corporation meter ceases to function or operate properly.

7.2 Siting and construction standards

Where an approved siting construction operation and maintenance plan or works plan is recorded in the water register, water may only be taken through the works if they are sited and constructed in accordance with any endorsed works plan.

7.3 Alteration, removal and decommissioning

Works must not be altered, removed or decommissioned without a works licence that authorises alteration, removal or decommissioning.

7.4 Using waterways and wetlands to store or convey water

Where an endorsed works plan specifies that water may be stored in or conveyed through waterways or wetlands, water may only be taken through the works while the licence holder meets the relevant monitoring and correctional requirements specified in the endorsed works plan with regard to:

- i. installing and maintaining the specified monitoring equipment;
- ii. following the specified data reading, recording, reporting and auditing requirements; and
- iii. carrying out the specified corrective action procedures within the specified time, if the specified threshold for this is breached.

7.5 Preventing pollution

Water must not be taken through the works if the Water Corporation reasonably believes fuel, or lubricant, or any other matter used in connection with works and appliances associated with the licence, is at risk of entering the waterway, or aquifer, or into the riparian or riverine environment.

The licence holder must, if required by the Water Corporation, construct and maintain bund walls around any hydrocarbon fuel driven engine, motor, fuel storage, or chemical storage used in connection with works and appliances associated with this licence in accordance with the timeframe, specifications, guidelines or standards specified by the Water Corporation.

8. Cost-share

The proponent will meet reasonable costs incurred by agencies in accordance with the Essential Services Commission determination. Agencies will detail in Agency Operational Procedures their procedures and agreed cost structure for implementing cost recovery processes and monitoring the level of cost imposed.

9. Roles and Responsibilities in Approving Irrigation Development

The roles and responsibilities of the key agencies/ organisations in the operation of the Regional Irrigation Development Guidelines are provided as a guide with some roles being interchangeable between the agencies in a regional context.

9.1 Minister for Water

- Defines water-use objectives that may be addressed through a Water-Use Licence.
- Sets a consultative process for reviewing water-use licence conditions.

9.2 Department of Sustainability and Environment

1. Advises the Minister on water trade issues including Regional Irrigation Development Guidelines.
2. Is the referral authority at regional level for advising local government on native flora and fauna issues.
3. Enforces compliance with Works Licence conditions in relation to its statutory obligations.
4. Directly manages crown land and authorises use or activities on that land, generally by use of a licence. This includes forests, stream frontages, unused roads and other crown reserves.
5. Indirectly manages crown land by authorising other parties or agencies, for example Parks Vic, to manage that land on behalf of the crown.

* No works should be undertaken on crown land without the express written permission of the Department of Sustainability and Environment.

9.3 Catchment Management Authority

- Develops and recommends Regional Irrigation Development Guidelines for Catchment Management Authority and Rural Water Corporation Board approval.

- Has overall responsibility for overseeing implementation of the Regional Irrigation Development Guidelines and advises the Minister for Water accordingly.
- Has coordination responsibility for implementing the Regional Irrigation Development Guidelines but may recommend that this be undertaken by Department of Primary Industries (via Irrigation Development Coordinator).
- Audits compliance with the Regional Irrigation Development Guidelines and advises the Minister for Water accordingly.
- Coordinates funding submissions, through the annual investment process, to enable the provision of services to address irrigation developments.
- Provides a single referral contact for all Regional Irrigation Development Guideline related matters.

9.4 Rural Water Corporation

- Issues licences for new development in accordance with the Regional Irrigation Development Guidelines.
- Determines the availability of supply delivery capacity necessary for the development to proceed.
- Approves farm irrigation systems in accordance with the Regional Irrigation Development Guidelines.
- Collects, manages, and reports on new irrigation development levies relevant to land and water protection.
- Issues Section 64 Water-Use Licences and Section 67 Works Licences.
- Enforces compliance with licence conditions.
- Provides a single referral contact for all Regional Irrigation Development Guideline related matters.
- Endorses Irrigation and Drainage Plans.

9.5 Department of Primary Industries

- Provides impartial advice to private land managers on irrigation system selection.
- Provides a single referral contact for all Regional Irrigation Development Guideline related matters.

- Provides advice on water-use efficiency including whole farm planning, reuse systems and automated irrigation.
- Provides advice on best practice for protection and enhancement of biodiversity assets.
- Provides coordination and consideration of surface water management.

9.6 Irrigation Development Coordinator

- Provides a single point of contact for the proponent for Regional Irrigation Development Guidelines process.
- Ensures that the Regional Irrigation Development Guidelines are being consistently applied.
- Advise the proponent through the irrigation development approval process.
- Coordinates the involvement of the respective agencies in the approval process.
- Reports to the Catchment Management Authority on the implementation of the Regional Irrigation Development Guidelines.
- Liaises with other Irrigation Development Coordinators to coordinate a regular process to maintain consistent standards as Regional Irrigation Development Guidelines are periodically updated.

9.7 Local Government

- Assesses/issues planning permits associated with development including subdivisions, native vegetation removal, zoning, dams, roads and other issues.
- Enforces compliance of planning permit conditions.

9.8 Proponent

- The proponent is defined in these Guidelines as the owner of the land on which the proposed development is to occur, or a person/s who has been authorised by the landowner to undertake the development.
- The onus is on the proponent to demonstrate the impacts of the proposal, the means by which any impacts are to be mitigated and compliance with the Regional Irrigation Development Guidelines.

- Forwards all necessary documentation to the relevant organisation in relation to the proposed development.

10. Process for Approving Irrigation Development

A multi-stage risk based approach will be adopted to efficiently determine whether or not the Regional Irrigation Development Guidelines are initiated and if so, to determine the suitability of the proposed development at each stage of the assessment processes. The level of detail required in the risk assessments will reflect the complexity and potential impact of the development proposal on the environmental and cultural assets associated with the proponent's irrigation development proposal.

The generic process is outlined in Appendix 1.



11. Dispute Resolution

11.1 Agency

In the event that issues can not be resolved at an operational level they will be referred to an inter-Agency Committee.

11.2 Proponent

A proponent may appeal against an assessed outcome of the Regional Irrigation Development Guideline process directly to the relevant Catchment Management Authority.

It is important that the proponent has a course of appeal if they consider the conditions prescribed in the Regional Irrigation Development Guidelines to be unreasonable, or if they have a preferred alternative course of action to meet the water-use objectives. Division 8 Section 64AN of the Water (Resource Management) Act 2005 states that a person may apply to a tribunal for a review of the decision of the Minister for Water to refuse an application by the person for a water-use licence.

Any dispute should be approached and resolved in a cooperative and consultative manner.

It is likely that the proponent would appeal to the Water Corporation who has overall responsibility for approving the development and issuing the irrigation licence. The Water Corporation will notify the Catchment Management Authority and the Irrigation Development Coordinator.

The Water Corporation will interview the proponent and undertake a preliminary investigation including a review of the application of the Regional Irrigation Development Guidelines in consultation with the Catchment Management Authority and the Irrigation Development Coordinator.

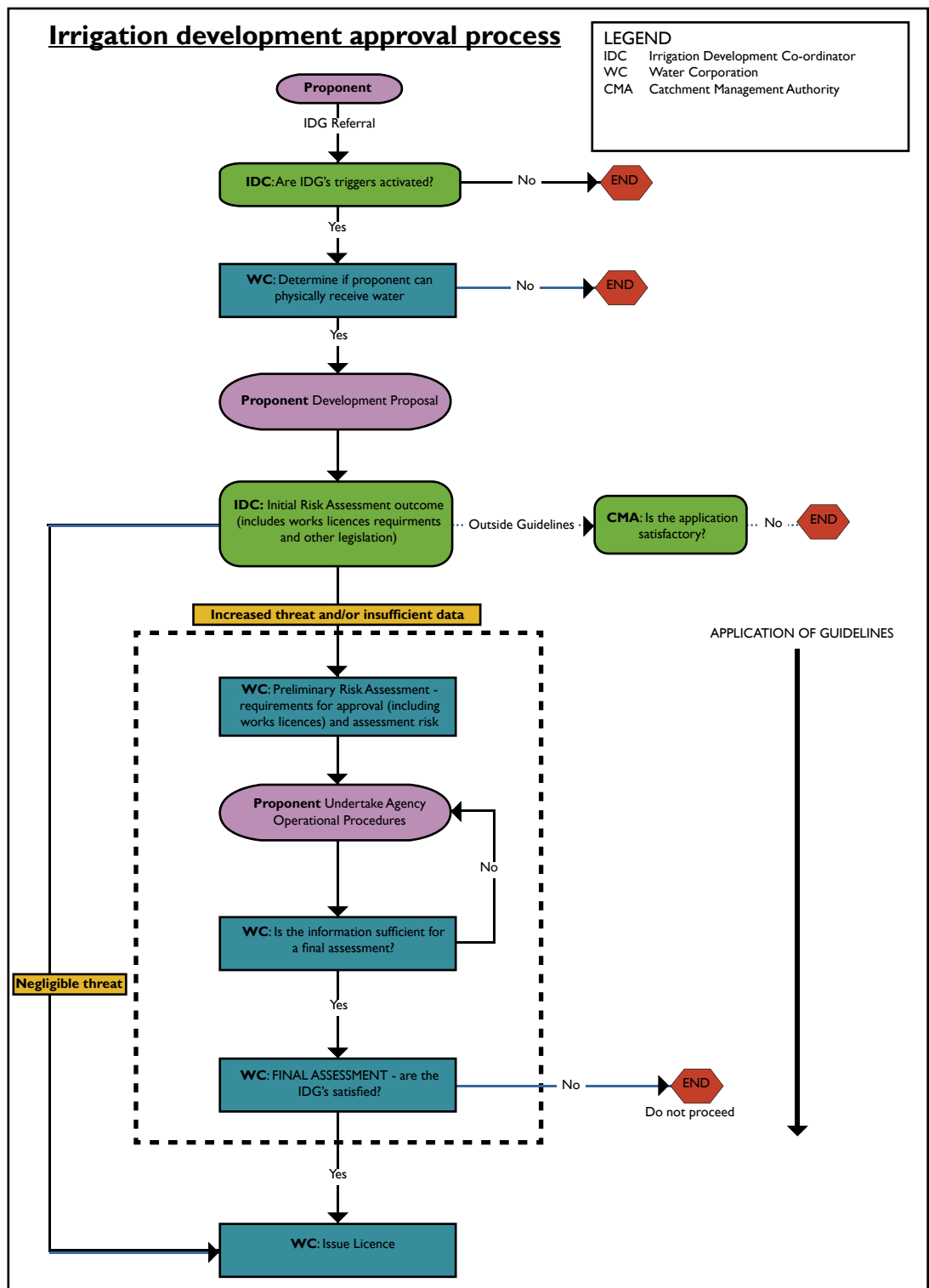
If the dispute is not satisfactorily resolved the proponent may appeal to a panel chaired by the Catchment Management Authority which includes a representative of the Water Services Committee, the Catchment Management Authority nominated representative and Department of Sustainability and Environment. The Water Corporation and Irrigation Development Coordinator will provide the panel with a report of their preliminary investigations and review of compliance with the Regional Irrigation Development Guidelines.

If the dispute still cannot be resolved then the proponent may take the dispute to a more formal and final resolution process eg. Victorian Civil Administrative Tribunal.



Appendix I

Irrigation development approval process



Appendix 2

Additional conditions for Water Use Licences (subject to the Regional Irrigation Development Guidelines: Maximum Application Rates)

The principles and methodology that have been followed in determining maximum application rates are consistent with those set out in “**Crop evapotranspiration – Guidelines for computing crop water requirements**”, FAO Irrigation and Drainage Paper 56.

The maximum application rates set out here take into account some regional considerations, notably variations in evapotranspiration and rainfall.

Maximum Application Rates

The maximum application rates (in ML per hectare per year, where year is any 12-month period from 1 July to 30 June) are to be used in conjunction with irrigated areas (in hectares) to determine annual use limits.

These maximum application rates have been determined taking account of:

1. Annual crop irrigation requirements (including evapotranspiration and leaching);
2. Soil hydraulic conductivity;
3. Uniformity of water application / irrigation system efficiency; and
4. All sources of water used on the property (including groundwater and surface water).

Note: Where an irrigator can show, using the principles and methodology set out in the above publication, that because of local conditions, special crops, or an individual irrigation and drainage system - the application rate can safely be higher than the relevant one set out here, the Minister for Water may employ such higher application rate in determining the annual use limit.

Mallee region (downstream of Nyah pumps)

The maximum application rates in the following table are subject to note above.

Crop type	Maximum application rate
Wine grapes and dried vine fruits	9 ML/ha
Table grapes	12 ML/ha
Carrots (summer plus winter crop)	12 ML/ha
Almonds	14 ML/ha
Potatoes (summer plus winter crop)	15 ML/ha
Walnuts	15.5 ML/ha
Other	As agreed in writing by Department of Sustainability and Environment after consultation with relevant water authorities, and Mallee CMA.

Goulburn-Murray Water region (upstream of Nyah pumps)

Drainage class	Maximum water use, on suitable land
Off-farm drainage <i>and</i> drainage re-use <i>or</i> pressurised irrigation systems	• 10 ML/ha (11 ML/ha in the Loddon Murray Area north of Kangaroo Lake)
Either: off-farm drainage, or: drainage re-use	• 7.2 ML/ha
No off-farm drainage or drainage re-use	• 5 ML/ha

North East Catchment Management Authority Annual Use Limits

New Irrigation licence applications will attract a Maximum Irrigation Water Use Limit (MIWUL) expressed as ML/ha. This MIWUL is the maximum amount of water that will be allocated per hectare.

Irrigation within the North East Victorian region is used primarily to supplement rainfall. Both evaporation and rainfall vary significantly across the region, therefore MIWUL will be location and crop type specific throughout the region. The MIWUL aims to provide enough water to meet plant needs for eight out of ten years. The MIWUL will be calculated via the following steps:

- a. Obtain evaporation and rainfall data for a specific location dating back to 1950
- b. For each year calculate the Irrigation Requirement (IR)* for each month from October through to the end of April using the formula below.

$$IR = (\text{Evaporation} \times \text{crop factor}^*) \text{ minus (rainfall to a maximum of 40 mm per day).}$$

*The crop factor will vary depending on the crop type grown (The crop factor can be either the crop factor set out in FAO Irrigation and Drainage paper 56 or another reasonable crop factor approved by the Minister)

- c. Sum the positive months only for each year, to get an Annual Irrigation Requirement (AIR)
- d. Calculate the 80th percentile of these AIR over this period (ie providing enough water for 8 out of 10 years)
- e. Divide this by 100 (to express the results in ML/ha)

It is recognised there is a large range of soil types in the North East region and not all are suitable to the different types of irrigation systems. It is anticipated by limiting the water allowed per hectare irrigators will choose the most appropriate irrigation system to their soil type.

An indication of the MIWUL (ML/ha) for different pasture and crops at various location is provided in the following table. Crop factors of 0.8 for pasture 0.7 for fruit trees such as apples, and 0.5 for viticulture have been used.

Indication of maximum water use limits (ML/ha) for different crops at different North East locations

Crop type	Pasture/fodder crops	Fruit tree (eg apples)	Viticulture
Crop coefficient	0.8	0.7	0.5
Rutherglen	8.5	7.2	4.7
Corryong	5.3	4.3	2.5
Dederang	5.7	4.7	2.9
Whitfield	5.5	4.6	2.7
Mitta Mitta	5.3	4.3	2.5
Kiewa	6.9	5.8	3.7
Myrtleford	5.8	4.8	2.8

Since these figures are based on rainfall and evaporation rates from 1950 till the end of summer 2007 it is recommended these be reviewed in 5 years given the possible consequence of climate change.

Appendix 3

**Map: Catchment Management Authorities
(where the Regional Irrigation Development Guidelines apply)**

