



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

IDMP Guidelines - Readers' Note

This document is part of a larger publication. The remaining parts and full version of the publication can be found at:

<http://www.dpi.nsw.gov.au/agriculture/resources/water-irrigation/irrigation/idmp>

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Section 4. Soil, water and climate

Outcomes

An analysis of soil, water and climate to determine the area's suitability for irrigation:

- » *soil moisture availability for plant growth*
- » *water available for irrigation, and its quality*
- » *how climate affects the farm's irrigation requirements*

Report for section 4

4.1 Survey method for irrigated soils

Either say which **default method*** of soil survey has been used, or justify the soil survey method used and the number of sampling sites chosen.

* The **default methods** for irrigated survey are:

- » electromagnetic surveys, with representative soil sampling
- » landscape assessment, with representative soil sampling
- » for horticulture: soils sampled on a 75 × 75 m grid
- » for broadacre crops: soils sampled on a 200 × 200 m grid
- » for supply storage and channels: electromagnetic surveys, with representative soil sampling

Sampling should allow major soil type boundaries to be identified and mapped.

4.2 Soil profiles

Provide a full profile description for the soil pit or pits for each major soil type. Match these descriptions to the soil map.

- » Each major soil type should have at least one soil pit.
- » The soil pit should be at least 1.2–1.5 metres deep, or to bedrock, or to at least 0.3 metres below the rootzone of the current or proposed crop.

The profile description should cover the soil and its irrigation characteristics, including any locally specific aspects:

- » its classification, texture and structure (including restrictive layers)
- » depth of each soil layer ('horizon')
- » electrical conductivity (EC) of each soil layer
- » depth of the rootzone
- » slaking and dispersion (from the Emerson aggregate test)
- » estimate of total available water and surface infiltration rates
- » estimated readily available water for current or proposed crops
- » any seasonal or permanent groundwater

Note any treatments for physical and chemical soil deterioration and soil erosion.

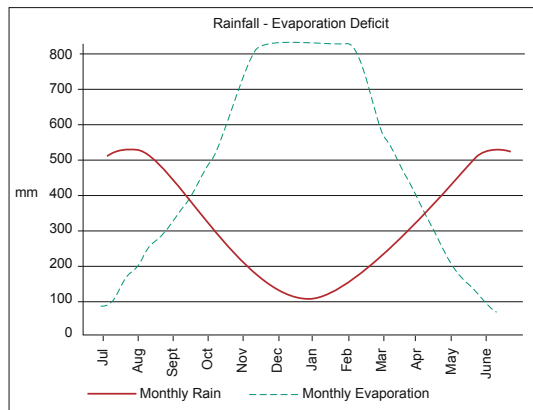
4.3 Water report: quantity

Note the amount of water available from each source, including dams, bores, regulated or unregulated streams, town water, effluent ponds, and harvestable rights.

List all water licences, volumes and conditions of use (here or in section 2.6).

Note any limits on supply including reliability, rosters or low flow restrictions, water-sharing plans and access conditions, and bore/well/spearpoint yields.

- » For bores, wells and spearpoints, give a detailed history of use or pump test/water recovery data.



4.4 Water quality

Describe the water quality for each irrigation source. Depending on the source, water analysis results will include:

- » salinity (EC)
- » pH
- » total dissolved solids (TDS)
- » chloride
- » sodium adsorption ratio (SAR)
- » calcium carbonates

Irrigation Officers may recommend other tests on water quality, depending on the region.

4.5 Climate report

Detail the 50th and 90th percentile distribution of rainfall, monthly and daily mean evaporation, and daily evapotranspiration (ET). Record climatic limitations to crop growth (frost periods, degree days, storm, hail).

Estimate the average monthly and annual effective rainfall.

Analyse the influence of local climatic conditions on irrigation management, crop production, and irrigation requirements.

Soil surveys for areas irrigated with enriched water, such as dairy effluent

If water is sourced from effluent streams, such as sewage treatment ponds or works or other enriched water sources, include an assessment of the soil's current:

- » nutrient status (phosphorus sorption capacity, available phosphorus, cation exchange capacity (CEC) and exchangeable cations)
- » sodicity
- » salinity (EC)
- » pH

Calculate the volume and availability of the supply.

Test effluent quality: this includes salinity (EC) and sodium hazard, pH, BOD₅ (for treatment pond systems), and effluent nutrient values (total Kjeldahl nitrogen, sodium, potassium, magnesium and calcium).

The nutrient status of the water source, the crop or the soil may limit effluent use.

Assess likelihood of seasonal variation and determine likely impacts of water quality on soils, crops and irrigation systems. Explain how these issues can best be addressed.

Plan/overlay/map for section 4

4.1 Survey for irrigated soils

EM31 soil survey (optional): EM31 survey map of irrigated area and any proposed irrigation areas.

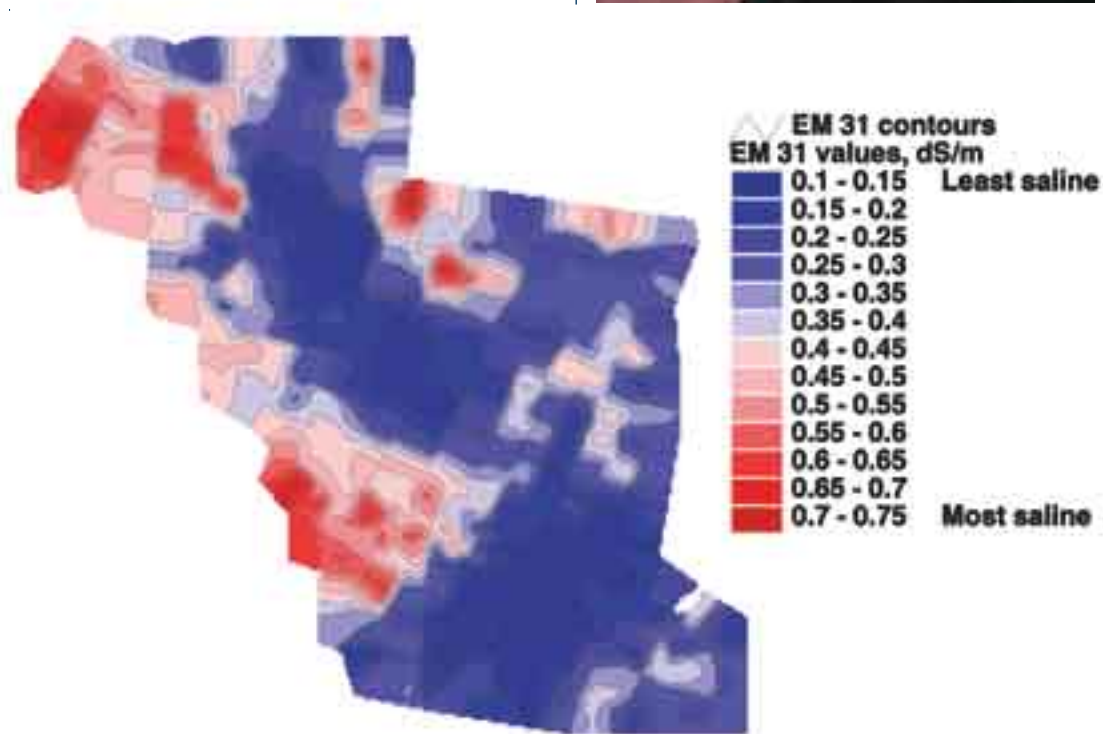
Property's soil variability and irrigation characteristics: show soil sampling sites.

4.2 Soil profiles

Map soil types and show their irrigation characteristics, including available water.

Show areas with similar management characteristics.

Show areas with shallow groundwater.



EM31 soil survey

Section 5. Irrigated cropping enterprises

Outcomes

Current and proposed cropping requirements and how the cropping system matches the available natural resources.

Report for section 5

5.1 Current and proposed crops

List current crops and crop areas.

List any alternative crops being considered.

List current property and regional crop performance benchmarks for current and proposed crops.

5.2 Rotations

Describe crop rotations.

5.3 Crop water requirements

Confirm that the quality and quantity of the available water are suitable for the current and proposed crops.

5.4 Special irrigation requirements

List the irrigation requirements for any specific crop quality or yields.

5.5 Soil suitability

Comment on the suitability of the soils for the current and proposed crops.

5.6 Water budgets

Prepare annual and monthly water budgets for the irrigated cropping program based on crop water requirements for each growth stage and on average and 90th percentile climatic data.

Plan/overlay/map for section 5

For permanent crops, map and identify crop types and varietal differences.

Identify paddocks for annual crops by name or number and match to your crop report.

If sourcing irrigation water from enriched water sources

Your budget will include use of effluent and the limits on this use (see sections 4.3 and 4.4).

Indicate how much or how often the effluent might be applied. (Effluent applications should match or be less than the water and nutrient requirements of the crop. For dairies, effluent volume and nutrient status depend on water use, herd confinement, and disposal system.)

Section 6. Irrigation system

Outcomes

An evaluation of the current irrigation system and current irrigation management practices and recommendations for improvement.

Report for section 6

6.1 Description of current irrigation system

Describe the current irrigation system, its main components and how it is used in crop production. Include its original design specifications (if available) and the specifications of any modifications and their purpose.

Outline its maintenance requirements and the maintenance schedule.

6.2 System evaluation

Evaluate the irrigation system and analyse its performance.

Report on the current system's performance against design specifications for the system and its components (if known).

For a pressure irrigation system, include evaluations of:

- » Pumps – note suction lift, shut-off head, operating pressure ranges and current pump efficiency.
- » Blocks (valves) – for each block, note the number of emitters/outlets and the operating pressure.

- » Emitters (for example, sprinklers) – provide emitter details (jet sizes), rated discharge and operating pressures.

Determine current operating pressure or discharge ranges, mean application rates and application uniformity.

- » Filters (where fitted) – report on effectiveness of filters, flow rates and water quality.

Provide pressure readings before and after the filters. Outline cleaning and backflushing procedures.

For a surface irrigation system, include evaluations of:

- » Pumps – note suction lift, shut-off head, operating pressure ranges and current pump efficiency.
- » Channels – describe freeboard, head loss through structures, condition of channels and command over fields.
- » Fields – determine infiltration depth, extent of waterlogging, irrigation duration for each field, the volume of water applied, and, for each field, its bay size, area and length.

6.3 Operating the system

Describe the current irrigation operation. Include the number of hours per block/field, the days to meet total farm crop water requirements, maximum daily pumping rates/times and practices, and the pumping costs per megalitre.

Describe the labour required to operate the irrigation system and any limits on available labour.

6.4 Maintenance and monitoring

Describe the current maintenance schedule.

Describe the crop water use monitoring program.

6.5 System performance and management

Assess the irrigation system's capacity to meet crop water needs.

Determine the water use efficiency of current irrigation management practices.

List recommended changes and improvements.

Plan/overlay/map for section 6

6.1 Current irrigation system

Map the current irrigation system, including water supply infrastructure, distribution and application systems.

6.2 System evaluation

For a pressure irrigation system, note storages, pumps, pipelines, hydrant locations, valve locations, spray locations (or irrigator runs), and filtration system (where fitted).

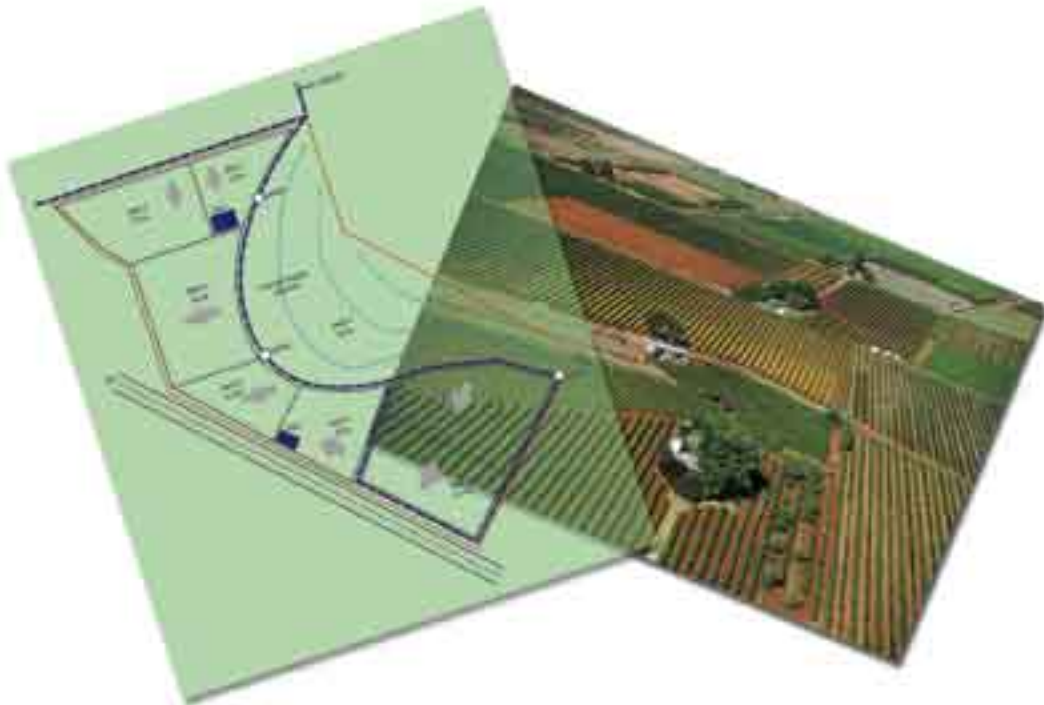
For a surface irrigation system, note channels, bay/paddock areas, outlets, control structures, drains, storages and pumps.

Provide levels:

- » for the top and bottom of bays/paddocks, supply and drainage lines
- » for command, where this is from a gravity supply

6.4 Maintenance and monitoring

Show location of soil moisture monitoring equipment and water meters, if used.



Section 7. Irrigation drainage, recycling and effluent systems

Outcomes

An evaluation of the current drainage, recycling and effluent systems (as appropriate) and current drainage management practices.

Report for section 7

7.1 Reuse and drainage strategies

Outline your management objectives for maximising water reuse and minimising drainage impacts on groundwater or streams and rivers.

7.2 Description of current drainage and recycling system

Describe the current drainage and recycling system, its main components and its use in minimising drainage impacts and recycling water for crop production.

Describe the subsurface and surface systems that maintain shallow groundwater at a level below the rootzone, the capacity of the system to remove drainage, tailwater, and stormwater from the crop rootzone or field, and the current efficiency of the system that recycles water for crop production.

Describe the system's design specifications (if available) and the specifications of any modifications and their purpose.

7.3 Evaluation of current drainage and recycling system

Report on the current system's performance against design specifications for the system and its components. The evaluation should identify the crop area protected by the drainage system and the area and volume that is captured by the reuse system.

7.4 Evaluation of effluent pond storage

Check that the specifications of the system cover all design criteria and standards for sizing and siting effluent storage or treatment ponds.

7.5 Management systems for drainage and recycling

Assess the adequacy of the drainage and recycling system's performance and management practices.

Discuss potential improvements in the drainage and recycling system.

List recommended changes and improvements.

List any management modifications required to enable the current system to protect environmentally sensitive areas and to improve stormwater management, irrigation run-off and recycling, and effluent recycling and reuse.

Plan/overlay/map for section 7

7.2 Current drainage and recycling system

(This may be included on the system overlay/plan/map, as long as the information is still clear.)

Map the current drainage and recycling system.

For a pressure irrigation system, the system may include tile drains, sumps, pumps, and storages or connections to a drainage scheme or licensed outfall.

For a surface irrigation system, the system includes channels and diversion works, storages and pumps. Provide levels for the top and bottom of drainage lines.

For effluent systems, the system includes collection area, sullage pits, effluent ponds and effluent application system.

Mark location of groundwater monitoring equipment, if used.

Confirm that recycling/effluent storages are on sites that minimise seepage losses.



Section 8. Plan for action

Outcomes

An analysis of sections 1 to 7, recommendations for improvement or development of the system and management, and a schedule for revising the IDMP.

Report for section 8

8.1 Limitations and opportunities

Summarise the limitations and opportunities that have been identified in previous sections as affecting crop production and the effective, efficient use of water on your property.

8.2 Management changes

Provide details of changes to management in this section.

Outline how you will:

- 1 manage your water (quantity and quality) in average and dry years
- 2 monitor the irrigation and drainage system and enterprise performance

- 3 monitor the environmental impact of irrigation (for example, soil salinity and nutrients)
- 4 manage drainage to maximise reuse
- 5 minimise downstream pollution
- 6 schedule irrigations
- 7 maintain the irrigation and drainage system
- 8 meet your goals
- 9 meet community concerns from catchment and water management plans

Note who will do each of these tasks.

8.3 Action plan of proposed changes

For both management and system changes, outline your proposals for managing limitations and realising opportunities. List these changes and give a priority and a timetable for their implementation, perhaps using a table, as below:

Priority	Development change	Benefits WUE estimated	Timing	\$ cost	Other benefits/ comments

Assess each proposal for its benefits and costs, and refer to your assessment and your goals to rank each proposal. For works and management practices that will improve irrigation WUE, indicate how they will improve efficiency, and provide an estimate (as a volume or percentage) of how much water will be saved or better used.

In the 'comments' section, compare costs and benefits, particularly the cost of not developing the proposal or changing practices.

8.4 Schedule for revision

Provide details of when you will regularly review and revise the sections of the IDMP that give you objectives and targets for continuous improvement:

- » crop performance benchmarks (section 5.1)
- » water use efficiency and system capacity for crop water needs (section 6.5)
- » management objectives for water reuse and drainage (section 7.1)
- » system performance against design specifications (sections 6.2 and 7.3)
- » suggested system improvements (sections 6.5 and 7.5)
- » limitations and opportunities (section 8.1)

Plan/overlay/map for section 8

Show any proposed changes to infrastructure, landscape, natural features, crop area and the irrigation and drainage system.

Show how the proposed development connects to the current irrigation and drainage system and to the rest of the farm.

Map all proposed structures, controls, valves, and so on, and give details of the drainage and recycling system, including storage.

Show the location of proposed soil moisture and groundwater monitoring equipment.

Show locations for environmental monitoring.





Do I need to have my IDMP verified?

By preparing an IDMP you improve your knowledge of your irrigation business.

Having it reviewed by a NSW Agriculture Irrigation Officer will provide an impartial check on whether your IDMP is really helping you to manage your property effectively.

To have your IDMP reviewed, contact your local NSW Agriculture Irrigation Officer.

Contacts

Contact your local Irrigation Officer for advice on preparing an IDMP for your business.

Bega.....(02) 6492 1733

Dareton.....(03) 5027 4409

Deniliquin(03) 5881 9999

Dubbo(02) 6881 1270

Forbes(02) 6850 2922

Grafton(02) 6640 1600

Griffith(02) 6960 1300

Orange(02) 6391 3902

Tamworth(02) 6763 1100

Windsor.....(02) 4577 0600

Yanco.....(02) 6951 2611

or email waterwise@agric.nsw.gov.au

IDMP

Guidelines

These guidelines explain how to prepare an irrigation and drainage management plan.

Section 1: Owner's goals

Section 2: Property information, ownership details and location

Section 3: Infrastructure, topography and natural features

Section 4: Soil, water and climate

Section 5: Irrigated cropping enterprises

Section 6: Irrigation system

Section 7: Irrigation drainage, recycling and effluent systems

Section 8: Plan for action

