



Management of **dairy effluent**

2008 DairyGains Victorian Guidelines



Management of
dairy effluent

2008 DairyGains Victorian Guidelines

DairyGains funder



action
Salinity & Water
AUSTRALIA

DairyGains partnership



Victorian Farmers Federation
United Dairyfarmers of Victoria



Department of
Primary Industries



DairyGains project management



Published by: Department of Primary Industries on behalf of DairyGains
DPI Kyabram, 120 Cooma Rd, Kyabram, Victoria, Australia
May 2008
© The State of Victoria, 2008

This publication is copyright. No part may be reproduced by any process except in accordance with the provisions of the *Copyright Act 1968*.

Authorised by: Australian Dairy Farmers Limited
Level 2, Swann House, 22 William Street, Melbourne, Victoria 3000

Printed by: Paterson Press
1-9 Doonside Street, Richmond, Victoria 3121

ISBN: 978-1-74199-555-8

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Foreword.....	ii
Scope.....	iii
Purpose.....	iii
Part 1: Legislative Requirements and Industry Expectations	
Environment Protection Authority	4
Local Government.....	5
Rural Water Authorities.....	5
Catchment Management Authorities.....	5
Industry Considerations	5
Part 2: Management Guidelines	
Dairy Effluent Systems.....	6
Water Management	7
Solids Separation and Stockpiling.....	7
Roadsides, Underpasses, Laneways and Crossings.....	8
Pond Management.....	9
Reuse and Application.....	10
Monitoring and Record Keeping	11
Occupational Health and Safety.....	12
Animal Health.....	13
Odour	14
Noise	14
Weed and Seeds.....	15
Fly and Vermin.....	15
Part 3: Farm Plans	
Contingency Planning.....	16
Other Farm Plans.....	17
Part 4: Upgrades and New Developments	
Upgrades and New Developments	18
Glossary of Terms.....	20
Further Information	21
Guidelines Working Group.....	21
Acknowledgements.....	22

Foreword

DairyGains (Dairy, Government and Industry Nutrient Strategy) is an on-farm dairy effluent project with the key aims of improving the management of effluent, sustaining management into the long term, minimising environmental impacts and increasing nutrient efficiency.

These guidelines were developed under the auspices of DairyGains to unify information on dairy effluent management.

DairyGains is a partnership of the United Dairyfarmers of Victoria (UDV), Australian Dairy Products Federation (ADPF), the Victorian Department of Primary Industries (DPI) and Environment Protection Authority Victoria (EPA). Australian Dairy Farmers (ADF) manages the project on behalf of the UDV.

Allan Burgess
President
Australian Dairy Farmers

On-farm management of dairy effluent and the following re-use of this valuable nutrient source is an important undertaking for all dairy farmers across Australia. These DairyGains effluent management guidelines will enable Victorian dairy farmers to be aware of recommended management practices and environmental responsibilities.

Australian Dairy Farmers is pleased to be involved in this worthwhile effluent management project.

Doug Chant
President
United Dairyfarmers of Victoria

The United Dairyfarmers of Victoria (UDV) is proud to present to the Victorian dairy community these industry endorsed effluent guidelines. Considerable work has been done by DairyGains, DPI and EPA into examining all aspects of dairy effluent management issues and communicating this in a clear and effective manner.

The UDV believes these guidelines are an important tool for farmers, industry service providers and government agencies in understanding best practice for on-farm dairy effluent management.

These guidelines have been developed by the dairy industry in conjunction with the Victorian State Government as an acknowledgment of its commitment to the environment and the sustainability of the industry in Victoria.

Scope

These guidelines are intended to provide dairy farmers and service providers in Victoria with a clear and concise overview of their environmental management requirements and industry expectations in regards to effluent management.

The information in these guidelines is a collation of the **existing** environmental requirements and examples of best management practises that apply to both established and new dairy farms.

The guidelines focus on the outcomes expected from legislative requirements and industry, and provide practical examples in each section on how this can be achieved. This focus takes into account that each farm is unique with different individual circumstances such as physical, financial and management preferences.

All farms should achieve the objectives but how they achieve this is up to the individual. Farmers are encouraged to look at all options or strategies in order to meet the objectives taking into account what is best for their farm.

The guidelines do not provide technical information. These guidelines should be used in conjunction with the Effluent and Manure Management Database for the Australian Dairy Industry (refer to Further Information page).

Purpose

Meeting the objectives in these guidelines will assist you in complying with environmental legislation, industry and community expectation as well as potentially improving the productivity and profitability of your farm.

A well-managed effluent system is a valuable resource as it saves labour, reduces fertiliser costs, increases soil fertility, adds organic matter and provides valuable nutrients and moisture to crops and pastures.

A poorly managed effluent system has the potential to be detrimental to the environment, community and the productivity of a farm. It can lead to increased labour, maintenance, nutrient overload, invasive weeds, soil structure decline and loss of nutrients. Effluent in waterways will lead to degraded water quality, excessive algae growth, affect stock water supplies and has the potential to transfer disease.

The purpose of this guideline is to:

- Assist dairy farmers make informed and practical decisions in relation to dairy effluent management while taking into consideration farm productivity and environmental requirements.
- Inform and raise awareness of industry expectations and obligations for dairy effluent management.
- Establish clear standards and protocols for industry operators and service providers.
- Demonstrate that the dairy industry has an ongoing commitment to the environment.

Part 1: Legislative Requirements and Industry Expectations

Many agencies have an interest in how effluent is managed on farms. Outlined here are the responsibilities of various agencies in relation to effluent management as well as the expectations of the dairy industry.

Environment Protection Authority

The Environment Protection Authority (EPA) administers and enforces the *Environment Protection Act 1970* as well as various regulations and policies.

It is important to note that the environment protection framework in Victoria places the onus of environment protection on those that manage the land and water resources.

Farmers should be doing the following in regards to dairy effluent management in order to comply with the objectives of the Environment Protection Act and associated policies:

- All effluent from the dairy, feedpads, standoff areas, underpasses and tracks must be contained and reused (most commonly spread back on pastures and crop).
- Effluent must not enter surface waters (including billabongs, canals, springs, swamps, natural or artificial channels, lakes, lagoons, creeks and rivers).
- Runoff containing effluent must not leave the property boundary.
- Effluent must not enter ground waters either directly or through infiltration (for example seepage from ponds).
- Effluent must not contaminate land (discharging effluent onto the same small area over time will cause nutrient overload and contaminate land).
- Offensive odours must not impact beyond property boundaries.

Relevant legislation:

- *Environment Protection Act 1970*
- *State Environment Protection Policy (Waters of Victoria) 2003*
- *State Environment Protection Policy (Groundwaters of Victoria) 1997*
- *State Environment Protection Policy (Prevention and Management of Contamination of Land) 2002*

State environment protection policies are available at www.epa.vic.gov.au

Failure to meet these obligations will result in the EPA implementing the enforcement policy, which has consequences ranging from a warning, through improvement notices to fines or court action.

Improving on farm productivity whilst minimising the environmental impacts is paramount for the Victorian dairy industry.



Local Government

Local councils are responsible for managing the Victorian planning provisions. As requirements may vary across the state, please contact your local council planning department to find out the requirements in your area before commencing any works (for example planning, building or earthworks).

Local councils may require permits to be issued prior to construction of ponds and other infrastructure. Councils may also have defined use overlays for certain areas including environmental, landscape, floodway, inundation, public acquisition, land management and cultural heritage overlays.

Noise, vehicle activity and effluent spraying may also fall under council environmental health regulations.

Rural Water Authorities

Rural water authorities may have regulations that affect construction sites or the areas of reuse of effluent and should be consulted prior to conducting these activities.

Farms in potable water supply catchments should always consult the responsible catchment manager prior to new or changed effluent systems and management routines. In irrigation areas, water authorities may have specific conditions such as a minimum buffer distance between irrigation and drainage infrastructure and any pond construction or effluent conveyance.

Catchment Management Authorities

CMAs are responsible for waterway management, regional catchment strategies and regional river health strategies. Any works on waterways must be approved by the CMA.

Contact your CMA if you have questions about the classification of waterways, drains or wetlands on your farm.

- Effluent ponds must not be constructed on a waterway.

Industry Considerations

Dairy Farm Food Safety Programs and Quality Assurance

Dairy farm licence conditions are overseen by Dairy Food Safety Victoria. These conditions require an audit of the Food Safety Program (FSP) to be completed at least once every two years. Some milk companies incorporate the food safety program into a broader Quality Assurance (QA) program.

Farmers should be aware that implementation of a FSP or QA program does not ensure compliance or best practice for dairy effluent management.

All those involved in the design, installation and management of an effluent system are required to ensure legislative requirements are met. Farmers and service providers (contractors, consultants, designers) must ensure they are appropriately skilled and have up to date knowledge on requirements.

Part 2: Management Guidelines

These guidelines address the key areas involved in effluent management on dairy farms in Victoria. The recommended management practices outlined in these guidelines are not a complete list, explore practices relevant to your farm.

Objectives

Meeting the objectives in this document will assist you in complying with legislative and industry expectations. All farms should meet the objectives.

Recommended Management Practices

These are examples of practices which will assist in meeting the objectives. Objectives may be met using other practices than those listed in this guideline. Explore options to suit your situation.

Dairy Effluent Systems

Dairy effluent systems are designed to capture effluent from animal holding areas (for example dairy, feedpads, underpasses and calf sheds) and return it to pastures or crops on the farm. Nutrients can then be utilised for fodder production and kept from contaminating water or land.

Effluent systems are made up of many components, all of which need to be considered and applied in the farming system so that effluent management objectives are met. Systems will vary and contain different components depending on farm considerations (for example soil type, topography, climate and water) and preferred management.

The most common systems fall into two main categories, storage and reuse or direct application. Storage and reuse systems allow effluent to be stored and applied at low risk times to maximise production potential and minimise environmental risk. Direct application systems involve daily application of effluent which may be suitable in some areas depending on soil type, rainfall and farm management practices.

Overall Dairy Effluent System Objectives

- Capture all effluent generated from controlled areas such as sheds, feedpads and other areas where stock are held for extended periods of time, and effectively convey it to an appropriate management system.
- Manage your effluent system in a way that the effluent can be reused to effectively utilise the water and nutrients on crops and pasture.
- Manage all effluent in a manner that does not pollute groundwater, surface water or create offsite odours.
- Design and manage your effluent system to suit your site-specific requirements, for example, labour, topography, soils and maintenance.
- Review and modify your effluent system when farm circumstances change (for example herd expansions or changes in infrastructure).
- Ensure runoff containing effluent does not leave the boundary of a property.



All runoff containing effluent must be collected and reused.

Water Management

Objective

- To minimise water use and the generation of waste water.

Recommended Management Practices

- Divert platecooler water and stormwater (not containing effluent) away from the effluent stream to minimise the need for additional storage.
- Dry scrape intensively used areas to break up solids prior to using floodwash, hydrants or hosing systems.
- Where possible utilise effluent recycled from pond(s) for washdown of yards, feedpads and stock containment areas.

Platecooler water entering the effluent stream can double storage requirements.

Recycling effluent for washdown can cut water use in the dairy by half.



Conduct regular audits to determine farm water requirements. Utilise recycled water where possible.

Solids Separation and Stockpiling

Objectives

- Separate solids and debris from the effluent stream to minimise impact on pumps, pipes and storages and to minimise overflows and blockages.
- Separate solids to enable more effective handling and use of liquids and solids.
- Store solids in a manner that does not impact on groundwater, surface water or create offsite odours.
- Store solids in a manner that can be utilised for pasture and crop production.



Traps and sumps should be cleaned and maintained regularly to ensure the effective separation of liquids and solids.

Part 2: Management Guidelines

Separating solids increases options for reuse.

Solids Separation and Stockpiling cont.

Recommended Management Practices

- Direct drainage from dairy sheds, feedpads and yarding areas to a central location to collect and remove solids.
- Regularly clean solids traps, weeping walls, filters and screens associated with solid and liquid separation to ensure continual flow and prevent overflows and blockages.
- Establish an appropriate stockpile area close to a separation system to enable drainage from the drying stockpile to be contained and reused.
- Composting stockpiles should be regularly turned to ensure aeration. Information on composting guidelines is available from EPA regional offices.
- Periodically sample and test stockpile to accurately assess the nutrient levels to determine application rates.

Effluent must remain within the property boundary.

Roadsides, Underpasses, Laneways and Crossings

Objective

- Manage roads, underpasses, laneways and bridge crossings to ensure that effluent does not pollute groundwater, surface waters or surrounding land.

Recommended Management Practices

- Scrape and remove manure deposits from roadways, roadsides, laneways and bridge crossings to ensure any manure or runoff generated is controlled and reused.
- Manage effluent from underpasses to prevent discharge to waterways.
- Divert runoff from tracks to grassed areas at regular intervals to trap sediment and encourage infiltration.

Regularly maintain intensively used stock routes to ensure any manure or runoff generated is controlled and reused.



Pond Management

Objective

- Maintain and manage ponds to ensure adequate storage of effluent during the wet months or when application is not suitable.

Recommended Management Practices

- Ensure levee banks and diversion drains are maintained to prevent the runoff from surrounding areas entering the ponds.
- Monitor and repair damaged pond walls and banks to prevent seepage and overflows.
- Empty ponds prior to the wet period to ensure adequate capacity to cope with inflows.
- Ponds used for recycling should regularly be emptied onto pastures and crops to remove accumulating salts.
- Regularly spray and remove weeds on or around the ponds (chemicals safe for waterways).
- Remove accumulating sludge and solids on a regular basis to avoid blockages when irrigating.
- Agitate ponds prior to application to mix accumulated nutrients and salts.
- Regularly desludge ponds to ensure adequate storage capacity.
- Ensure trees do not grow on pond banks or create shading on pond surface as this may affect bank stability and pond activity.
- Leave a small amount of effluent in ponds when cleaning to prevent drying and to maintain microbial populations.
- Unused ponds should be cleaned out and filled in to protect ground and surface waters from overflow or infiltration and to ensure stock and human safety.

Crusting on ponds may indicate the pond is undersized or poorly managed.



Ponds provide an ideal option to store effluent over the wetter months allowing a more strategic application during the irrigation season.

Part 2: Management Guidelines

An essential component of any effluent system is to return the effluent produced from animal holding areas (liquid, slurry or solid) back onto pasture or crops in a manner that will optimise production and not pollute groundwater, surface water or create offsite odours.

Sufficient areas of the property should be identified so that effluent application can be sustained to achieve good production while avoiding water logging, nutrient overload and nutrient rich runoff.

Spreading effluent over larger areas of the farm allows better utilisation of nutrients and minimises the risk of metabolic disorders.

Reuse and Application

Objectives

- To ensure no offsite discharge or impact to groundwater, surface water, land or air when applying effluent.
- Utilise effluent collected to gain maximum productivity benefits from the nutrients, organic matter and water.

Recommended Management Practices

- Apply effluent when pasture and crops are actively growing to avoid losses and maximise nutrient uptake and yields.
- Adjust effluent application rates to suit your soil types to avoid runoff and leaching below plant root zones.
- Minimise over watering of irrigation bays and ensure reuse systems are in place to capture any runoff containing effluent.
- Avoid application of effluent in wet weather or on waterlogged pastures due to an increased likelihood of runoff.
- Avoid sensitive areas such as waterways, drainage lines and property boundaries when applying effluent.
- Avoid and restrict spray drift from sprinklers and irrigators.
- Regularly relocate movable sprinklers and irrigators to distribute nutrients over a large area of the property.
- Schedule effluent application immediately after grazing when pastures are short and a pasture-withholding period can be incorporated into the farm paddock rotation (refer to Animal Health section).
- Monitor effluent areas with soil tests and modify fertiliser applications to match soil fertility targets.
- Periodically sample ponds to determine nutrient concentration and application rates.

Adjust fertiliser rates on paddocks which are regularly used for effluent applications in accordance with soil testing.



Monitoring and Record Keeping

Keeping written records of effluent management activities and incidents is an important part of managing an effluent system. Records make it easy to observe withholding periods after effluent application to paddocks and to track nutrient levels and soil conditions over time. Recording any incidents (for example overflows and burst pipes) and action taken to correct problems is vital, particularly if dealing with disputes and authorities.

Objective

- To maintain adequate records and details associated with dairy effluent.

Recommended Management Practices

- Maintain a farm diary or map specifically noting location, date and volume of effluent application on specific paddocks to ensure minimal disruption to grazing rotations.
- Conduct regular soil testing to monitor fertility levels within farm management areas or individual paddocks.
- Periodically sample ponds, containment storages and solid stockpiles prior to the irrigation season to accurately analyse nutrient composition to determine application rates and areas.
- Annually sample bore water and other water sources used to supply dairy and feedpad facilities as poorer quality supplies may adversely impact on effluent systems and application rates.
- Maintain a complaint and incident register recording dates, complainants, weather conditions and issues to address.
- Notify appropriate authorities if effluent discharges offsite so that offsite impacts can be quickly addressed.



Regularly sample effluent ponds to determine application rates.

Part 2: Management Guidelines

Farm safety and accident prevention should be the highest priority on the farm. Farm surrounds should be as safe as possible; for workers, children, visitors, livestock and pets. Dairy effluent systems can be hazardous to both humans and livestock.

Effluent ponds can be very deep, with steep internal walls. It may even be difficult to locate the edge of the pond(s) and effluent containment areas due to excessive weed growth. The management of effluent also requires the regular use of a range of equipment and machinery, which requires operator training and regular maintenance programs.

WorkSafe Victoria oversees work place safety legislation and policy. Information on dairy farm safety and risk assessments is available from WorkSafe Victoria.

Occupational Health and Safety

Objective

- To provide a safe work environment and appropriate training for all staff, visitors and service providers.

Recommended Management Practices

- Identify and address potential risks and hazards associated with effluent systems and their management (for example, fencing and signage).
- Regularly maintain equipment.
- Implement training program for staff, contractors and visitors to inform them of potential dangers.

Ponds

- Control weeds and vegetative growth around pond and containment systems.
- Locate and clearly mark pond surfaces before moving machinery for desludging and maintenance activities.
- Pond agitation machinery should utilise wheel chocks or railing barriers to prevent vehicle movement.
- Avoid using recycled effluent inside milking sheds or vat-rooms due to potential contamination by bacteria, sediment, minerals and salts.
- Ensure appropriate fencing and signage is in place around ponds.

Equipment and Machinery

- Implement regular maintenance scheduling with appropriately trained personnel to ensure all equipment maintains operational performance.
- Promptly rectify equipment and machinery failures and breakdowns and put in place repair and maintenance programs.
- Ensure all guards and safety systems are in place on all machinery and equipment.
- Consider topography and areas around ponds when using slurry tankers and solid spreaders, as they are not suited to steep sloping country.

Ensure all hydraulic and power take off drive systems are disengaged before undertaking repairs.



Occupational Health and Safety CONT.

Confined Spaces

- Adhere to confined space regulations. Information available from WorkSafe Victoria.

Human Health

- Avoid unnecessary handling of effluent.
- Minimise spray drift from effluent equipment such as yard hydrants and sprinklers as they contain infectious material.
- Make sure you are up to date with any relevant inoculation (for example, Q fever).

Animal Health

The overall design and ongoing management of any effluent system is an integral part of managing the herd's welfare and performance. By ensuring effective cleaning processes within intensive areas and taking care with effluent applications, impacts on animal health can be avoided.

Objective

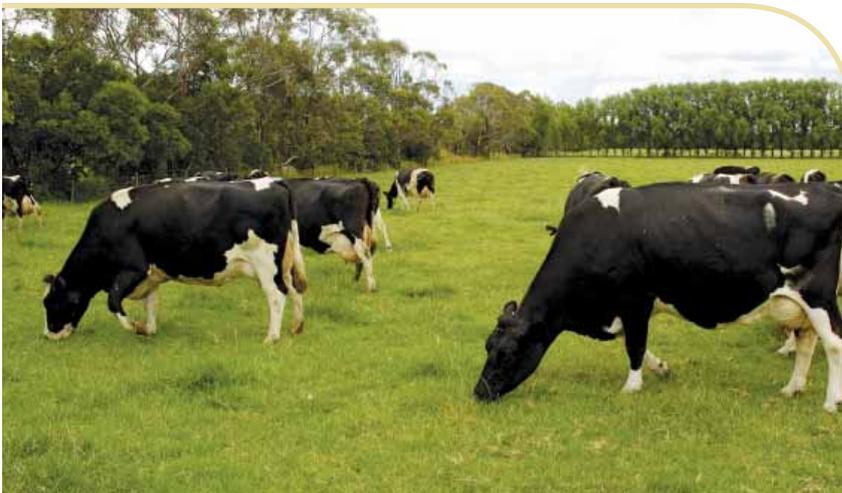
- Manage effluent to prevent and minimise potential infection and spread of disease.

Recommended Management Practices

- Don't allow any young stock (less than 12 months) to access land with effluent applied.
- To minimise health issues, avoid calving down cows on areas that have had significant applications of effluent.
- To avoid nitrate and palatability problems, withhold the milking stock for a minimum of 21 days from grazing paddocks that have been irrigated with effluent.
- Monitor effluent application areas for soil fertility targets to minimise potential herd health problems which may adversely affect production (for example, potassium levels).
- Provide stock with clean water from bores or tanks and avoid water that may have been contaminated by effluent.
- Ensure drainage networks from cattle grazed paddocks do not impact upon calf-rearing areas.

Effluent management equipment should be cleaned and disinfected between farms to reduce the spread of disease.

Exclude stock from around effluent ponds and drains to reduce the risk of spreading disease.



Establish a grazing management plan to ensure effluent applications don't compromise paddock rotations.

Part 2: Management Guidelines

Odour

Objective

- Manage effluent systems to reduce the risk of offensive odours impacting offsite.

Recommended Management Practices

- Consider wind direction when agitating, desludging or applying effluent sludge to pastures and crops.
- Establish and maintain suitable distances from neighbouring residences and property boundaries when applying or storing effluent.
- Avoid dumping large quantities of milk in the effluent system as it reduces pond performance and creates odours. Milk should be disposed of in accordance with a contingency plan.
- Reduce boggy and damp areas around yards and laneways with appropriate drainage and management practices.
- Remove spoilt and wasted feeds from intensive feeding areas and incorporate into manure stockpiles.

Noise

Objective

- Ensure noise from effluent management activities does not adversely impact upon neighbouring residences and community amenities.

Recommended Management Practices

- Correctly site equipment such as pumps away from sensitive areas such as neighbours and community amenities.
- Implement preventative maintenance programs on all plant and equipment to ensure noise levels are kept to a minimum.
- Conduct pond maintenance, desludging and pumping activities at times which will minimise impact on neighbours.

Establish appropriate buffer distances from neighbouring residences and property boundaries when spreading effluent on pastures and crops.



Weed and Seeds

Objective

- Prevent spread of undesirable weeds and seeds from stock containment, effluent storage and application areas.

Recommended Management Practices

- Use appropriate herbicide (safe for waterways) and practices to spray weeds growing around ponds, drainage, channel and stock camp areas.
- Apply effluent over a large area (rates calculated from soil and effluent testing) to prevent high nutrient levels and associated weed growth.
- Remove feed spoilage from around feedpad troughs and hay rings to minimise germination and spread.

Avoid continuous application of effluent on a small area as it promotes weed growth.

Fly and Vermin

Objective

- To put in place appropriate management activities to minimise fly and vermin populations associated with managing dairy effluent.

Recommended Management Practices

- Use appropriate baiting, trapping and spraying practices to control outbreaks.
- Reduce excessive weed and grass growth around ponds and feed storage areas.
- Maintain regular cleaning schedules to remove manure deposits around yarding and access ramps.
- Utilise appropriate herd health practices such as insecticide repellents.
- Avoid disposing of carcasses in and around pond areas, refer to EPA publication 660.1 (www.epa.vic.gov.au).
- Record and clearly erect signs at baiting and trapping stations.



Design and maintain all weather access for both stock and vehicles to and from dairy and feedpad facilities.

Part 3: Farm Plans

The development of farm plans can be a good way to identify issues, set priorities and plan how to address them on the farm.

A number of different plans may be used to address specific issues on your farm. These may include:

- **Contingency Plan** - Procedures and contact details for unexpected events, for example breakdowns and disease outbreaks.
- **Whole Farm Plan** - Focus on the overall management and layout of the entire property including improvements and infrastructure.
- **Environmental Management Plan** - Focus on general management of the whole farm taking into account the environment and associated risk.
- **Effluent Management Plan** - Technical design and management of effluent with a focus on effective use of nutrients.
- **Nutrient Management Plan** - Nutrient budgeting and mapping focusing on productive use of nutrients across the farm.

These farm plans can help you prioritise works, formulate a budget, stage developments, track and improve farm performance and plan for unexpected events.

Plans should be reviewed and updated regularly.

Contingency Planning

A contingency plan outlines procedures for when unexpected events occur such as machinery breakdowns, power failures and disease outbreaks. Contingency plans and procedures for emergency breakdowns are essential.

A contingency plan should contain procedures that can be put in place immediately when failures occur to minimise impact on farm operations as well as avoiding pollution to groundwater and surface waters. It is vital that all farm staff be familiar with contingency plans and procedures.

Objective

- To develop a contingency plan to ensure that effluent system failures and breakdowns do not impact on the operation of the farm or have any adverse effects on the environment.

Key Considerations

- Contingency plans should take into account things such as: floods, milk disposal, power disruptions, pump breakdowns, pond overflows, breaches and pump and pipe blockages.
- Plans should include contact details of service providers and relevant authorities.
- Plans should be accessible to all farm staff and clearly understood.
- Notify appropriate authorities immediately in the event effluent discharges into a waterway or leaves the property to enable authorities to assess impacts and if necessary notify down-stream users.
- Neighbours should be notified of any event that may impact on them.

Appropriate contingency plans and maintenance schedules are available in the DPI's agnote series on dairy effluent management.

Other Farm Plans

Farm plans are designed to address various aspects of the farm. Plans can focus on specific issues such as nutrient management or can encompass the whole farm.

Farm plans are often used to plan development and infrastructure changes and can be used to assist in overall management of the farm. Effluent management is a key component of any farm plan.

Plans may include: effluent management, risk management, environmental considerations, nutrient management, farm infrastructure, development and layout such as paddock subdivision, access, crops, shelter, water supply, habitat, pest/weed control, fire protection and labour.

Objective

- To ensure the effluent system and its management is incorporated into the farm planning process to optimise storage and application.

Key Considerations

- Develop farm plans that allow for expansion and modification of the existing system with long-term changes in farm management.
- Undertake appropriate environmental and farm investigations before developing the plan. For example, permeability tests, ground water location, nutrient fertility testing, pond sampling and analysis, soil profiling, and area of salinity.
- Ensure plans are developed by suitably trained service providers.
- Establish priorities to undertake stages of development without impacting on farm productivity.
- Regularly review and adjust plans to reflect current and future development and management practices.

Check with your local Catchment Management Authority to determine if incentives are available for the development of plans.



Farm plans should be tailored to suit the properties unique characteristics and management strategies.

Part 4: Upgrades and New Developments

Before commencing any work on the farm it is important to carefully plan changes. If you make changes to your farm (dairy upgrade, increase herd numbers or changed milking frequency) ensure that your effluent system is still suitable. You may need to upgrade or redesign your system.

Technical information for upgrades and new system design is available through the National Database for Dairy Effluent Management.

Site selection and design

Developing an effective dairy effluent system requires detailed planning taking into consideration the farm's individual characteristics such as soil profiles, topography, hydrology and climate. Systems should be integrated into existing and proposed farm infrastructure taking into account effluent reuse opportunities.

Choosing the most appropriate effluent system will depend on what is practical, easy to maintain, minimises risk to the environment (water, land and air) and has the potential to return the maximum benefits. The chosen system should enhance the long-term viability of the farm.

Systems must be designed to contain and manage the effluent stream from its generation to its application and reuse.

Objectives

- Design and site effluent systems so that all effluent generated from controlled areas such as sheds, feedpads, calf sheds and intensively stocked areas is captured and reused. All other runoff should be diverted from the system, unless calculated into the design.
- Design your effluent system in a way that the effluent can be reused to effectively utilise the water and nutrients on crops and pasture.
- Design and site effluent systems so that effluent does not pollute groundwater, surface water or leave the property.
- Design and site effluent systems to minimise offsite odours.
- Design and site the effluent system to ensure it is easily managed and maintained.

Key Considerations

- Consult appropriate authorities to ensure all legislative and planning requirements are met prior to development.
- Identify sensitive areas on the farm to ensure sufficient buffer distances are maintained during application of effluent.
- Consider yarding design principles, such as slope, dimensions, surfacing and nib walls, to optimise efficiencies in cattle flow and yard cleaning.
- When expanding the dairy or adding new infrastructure, review the system as a new or modified effluent system may be required.

Long-term planning enables investments to be made with confidence knowing existing or newly developed effluent system can accommodate the change.



Key Considerations (cont)

- Where possible integrate your effluent system into existing farm infrastructure.
- Ensure effluent system siting and design takes into consideration site specific requirements including climate, labour, safety, topography, soils, waterways and other sensitive environmental areas.
- Undertake appropriate soil and ground water investigations to determine the suitability of the selected site.
- Determine water and power requirements to ensure adequate access is available to maintain the system.
- Explore opportunities to utilise recycled effluent for yard cleaning to reduce storage requirements.
- All systems must have at least three days sump storage capacity to cater for pump failures and wet conditions.
- Install where possible rainfall diversion and tanks from roofs and yards to collect water for reuse.
- Where possible use gravity to move effluent around the farm.
- Consider designing the system to capture and store effluent during the wet months when runoff is likely.
- Identify storage site(s) to minimise potential environmental impacts.
- Determine the most appropriate application method based on site characteristics, management preferences and operating costs.
- Establish potential application areas for effluent based on soil characteristics, topography, nutrient requirements and ease of conveyance.
- System designs should incorporate Worksafe's occupational health and safety requirements.
- Ensure internal batter slopes on ponds are gradual enough to allow stock and people to exit if they fall in.
- Consider effluent management when siting cattle underpasses, feedpads and laneways.

Ponds must be constructed with materials that will prevent effluent from entering the groundwater. Sealing ponds with an impermeable layer of clay or a synthetic liner may be required.

Return topsoil following any earthworks around the pond, to encourage grass growth to stabilise banks and reduce cracking.



Explore intensive feeding options to determine the most appropriate system to maximise productivity, whilst minimising adverse impacts associated with high stocking areas.

Glossary of Terms

Best practice	Management practises which reflect best available knowledge, information and technologies. Best practice changes as new or updated information becomes available.
Community amenity	Areas that are used by the community and may be affected by effluent management.
Desludge	Removal of solid or slurry effluent from a pond, sump, drain or solids trap.
Impact	A detrimental or negative outcome or effect.
Infiltration	The downward movement of water or effluent through the ground into groundwater reserves.
Land contamination	Normal conditions of the land have been altered in a negative way that may affect productivity and biological health.
Levee bank	An earthen bank designed to confine or direct liquids and solids to or away from designated areas.
Nutrients	Elements such as phosphorus, potassium and nitrogen, are found in effluent and can be useful to agricultural production if applied as part of a planned approach but are harmful to water quality.
Outcomes	The expected or desired result.
Recycle	Use of water stored in effluent pond(s) for yard cleaning or other purposes.
Reuse	The application of solids or liquid effluent to land in a way that it is utilised for production.
Solids Separation	Separation of the solid and liquid components of effluent so they can be managed or utilised separately.
Slurry	Effluent in a form that is too thick to pump or spray and is unable to be handled as solid effluent. May be able to be pumped with specialist equipment.
Solid	Effluent in a solid form, that is, able to be moved mechanically (for example shovel or excavator), but unable to be pumped.
Stockpile	An area where solid effluent, feed wastage or bedding is stored before being spread on crops or pastures.
Surface waters	All waters except groundwater.
Waters	Includes any reservoir, tank, billabong, anabranch, canal, spring, swamp, natural or artificial channel, lake, lagoon, waterway, dam, tidal water, coastal water or groundwater.

Further Information

Effluent and Manure Management Database for the Australian Dairy Industry. (www.dairyingfortomorrow.com)

A technical information resource for effluent management and reuse. A nationally accepted resource to provide the basis for extension and education programs, technical information to support regulation on environmental protection and practical design for on farm effluent systems.

Department of Primary Industries Information - Notes Series Dairy Effluent Management (www.dpi.vic.gov.au)

A range of information notes on the technical design aspects for dairy effluent systems as well as application principles.

DairySAT (www.dairyingfortomorrow.com)

A self assessment tool assisting farmers to be pro-active in addressing environmental issues associated with their own farm .

Dairy Cattle Feedpad Guidelines for the Goulburn Broken Catchment (www.gbcma.vic.gov.au)

Fundamental guidelines assisting farmers undertake the development of dairy cattle feedpads.

WorkSafe Victoria – Dairy Safety: A Practical Guide (www.workcover.vic.gov.au)

Australian Dairy Farmers, DairyGains (www.australiandairyfarmers.com.au)

Environment Protection Authority

Information on EPA programs, Acts, State environment protection policies and guidelines can be found at www.epa.vic.gov.au

Guidelines Working Group

Department of Primary Industries Victoria

Scott McDonald
Ann McDowell
Barrie Bradshaw
Alex Goudy

Environment Protection Authority Victoria

Janine Price
David Mackenzie
Wayne Bath

Australian Dairy Farmers

Beverley Wallace

Heytesbury District Landcare Network

Dean Suckling

Dairy farmer, Woolsthorpe

Glenn Britnell

Acknowledgements

Rawdon Sthradher

FineFocus Video and Photography - Box Hill

Jeremy Beaumont

Layout and design - North Melbourne

Nicole Hunter

Communications planning, EPA

Rocky and Wendy Mardica

Dairy farmers, Labertouche

Alan and Edward Jefford

Dairy farmers, Darnum

Ron Paynter

Dairy farmer, Ellinbank

Barry and Megan Coster

Dairy farmers, Ripplebrook

Peter and Wilma Mackay

Poowong East

Department of Primary Industries

Ellinbank farm

Stephen Haughton

DPI Ellinbank

Sarah Hetherington

DPI Rutherglen

DairyGains project executive

The Guidelines Working Group would also wish to acknowledge those individuals and organisations that provided feedback during the industry consultation period.

