



Dairy Effluent: Applying Dairy Shed Effluent to Land

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Ultimately, all dairy shed and feedpad facility effluent management systems will need to have the ability to apply the effluent to land to remove the accumulating salts and return nutrients to where they are most needed.

Two management options

There are two main options for managing dairy effluent from facility point sources on your farm. They are:

- Applying effluent directly to land from the dairy yard or feedpad provided that there is minimal risk of pollution (Figure 1).
- Storing effluent during wet weather or when runoff may occur, and then applying it to land during periods when runoff is less likely. (Figure 2).

On irrigated farms where the primary method for applying the effluent to land relies on mixing the effluent with irrigation water, the actual period of effluent storage may need to be extended to the period between the end of an irrigation season and the start of the next season.

Direct application

This system works by draining effluent off the yard to a single collection point (a sump). The effluent is then transported via pipes or channels to a suitable area of the farm and spread on a daily basis.

Effluent can be applied to pasture using either:

- keyline drains,
- flood irrigation (only during the irrigation season),
- manual shift sprinklers, pivot or lateral spray irrigation,
- manure carts or slurry tankers

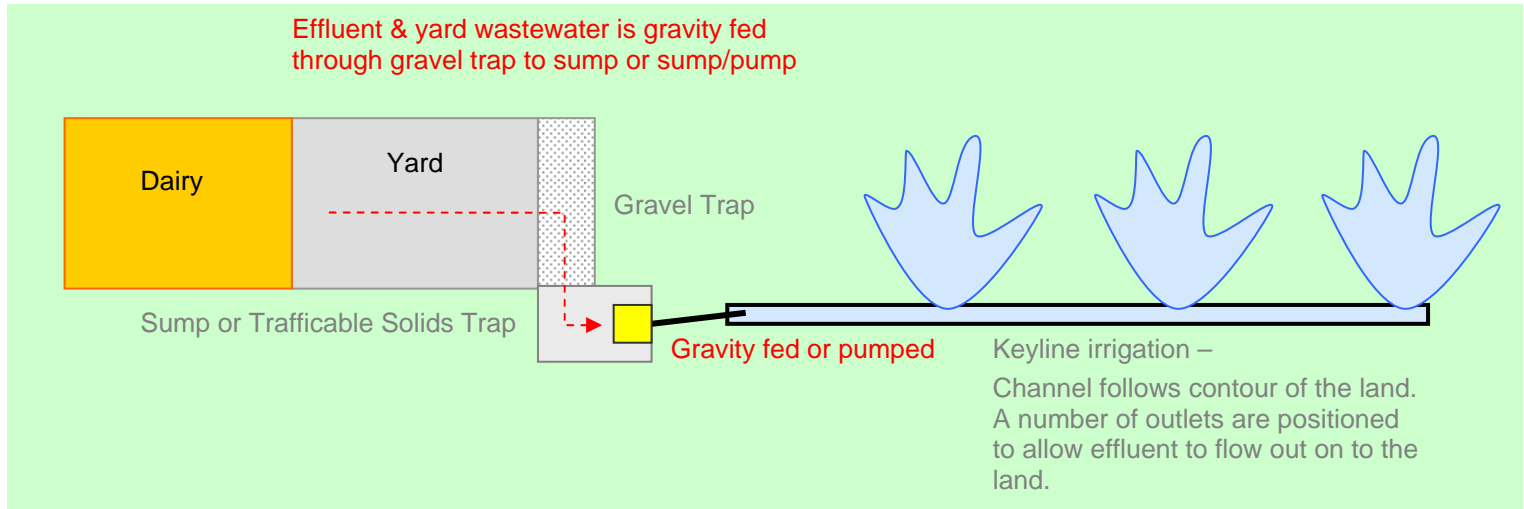
- travelling irrigators.

When applying effluent directly to land it should be managed in such a way that the water and nutrients are absorbed by the plants and soil. This will mean there is a reduced likelihood of runoff that could contaminate surface waters, ground water, neighbouring properties or community drainage schemes.

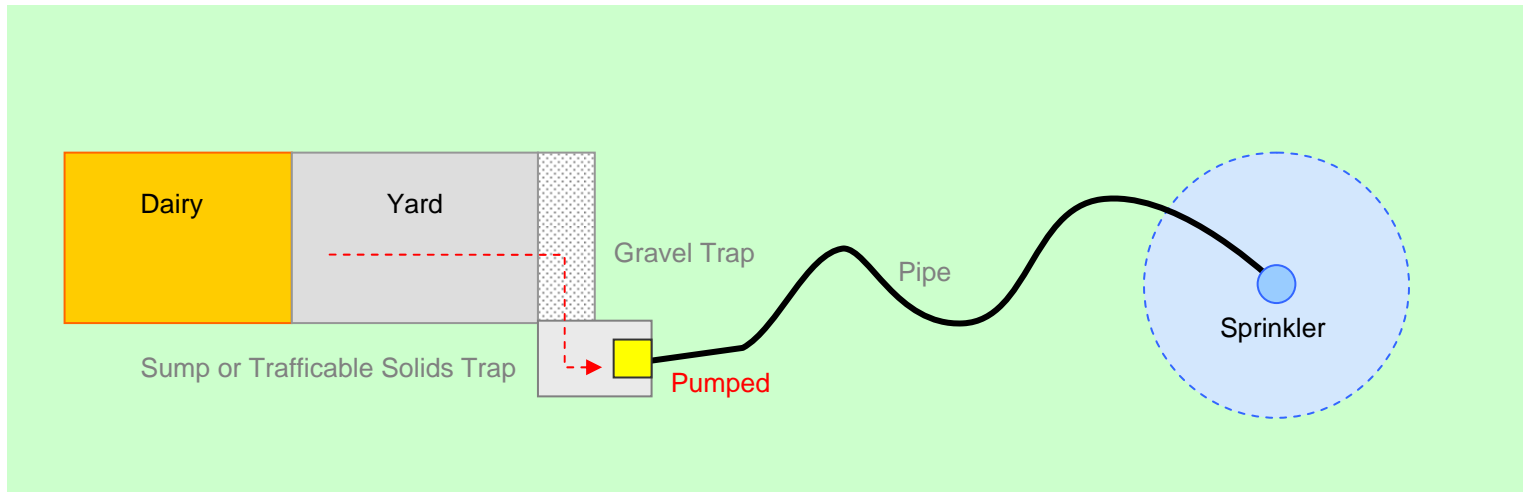
In applying effluent directly to land from the dairy yard or feedpad, consider the following points:

- As there is no constructed storage facility, **the effluent must still be contained within the boundary of your farm at all times.**
- Continually applying organic matter and solids to the same area increases the chance of clogging the soil pores and reducing infiltration.
- Direct application of raw effluent in a controlled manner will maximise the use of nutrients in the effluent, as some nutrients are lost during storage.
- Direct application of effluent to land provides the least opportunity for the control of any harmful diseases that may be present in the effluent. During storage the numbers of any harmful organisms are reduced but they are not necessarily totally destroyed.
- Without storage facilities there is very limited opportunity to manage the application of effluent to complement other farm management requirements. Applying effluent to waterlogged pastures will obviously be detrimental, and applying effluent to pastures at times that don't suit the grazing rotation will also be inappropriate. Direct application also provides little control over the volume of effluent applied.

a) Sump & keyline application



b) Sump, pump & sprinkler



c) Manure Tanker

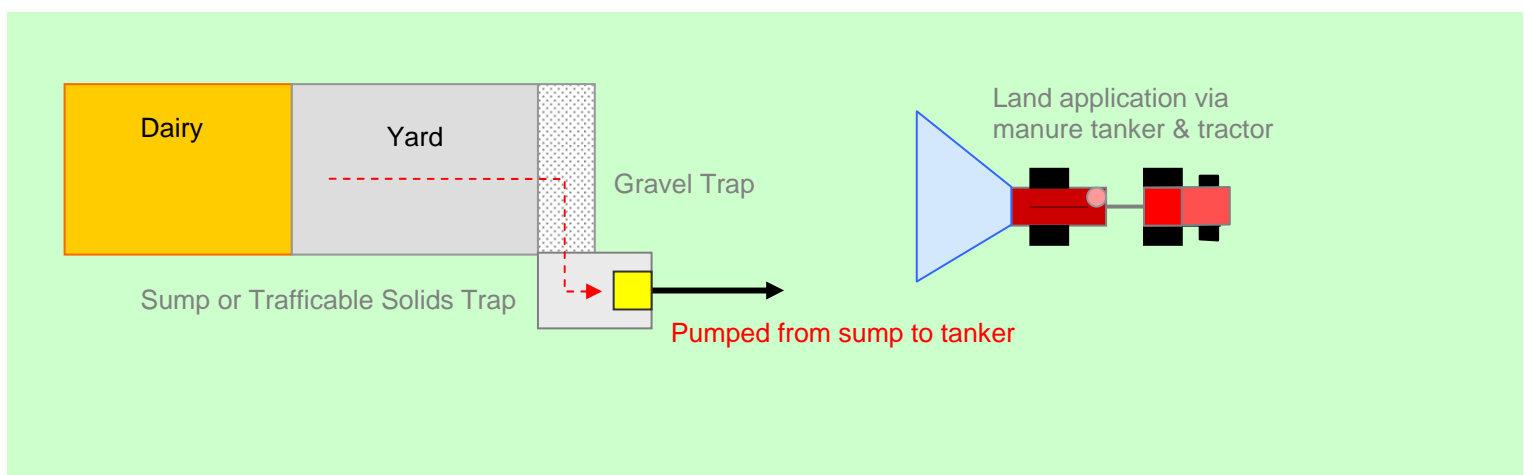


Figure. 1: Some methods of applying untreated effluent directly to land on a daily basis

Storage prior to application

The second option is to store effluent and apply it to land when conditions are suitable. This provides a greater level of control over runoff whilst minimising the risks of effluent leaving the farm boundary and is more likely to meet plant nutrient and water requirements. It also means that the application of effluent can be timed to meet the requirements of the receiving pasture or crop. The provision of storage allows the operator to schedule the application to fit in with the availability of labour rather than having to attend to the application of effluent on a daily basis.

The provision of storage in an effluent system gives the operator control over the amount of effluent applied and the timing of its application with respect to pasture rotations and disease control.

When applying stored effluent to land, consider the following points:

- The storage of effluent makes it easier to contain within the boundary of your farm. You must provide sufficient storage capacity to hold effluent generated during periods when land application is likely to result in pollution. See Agriculture Note AG0441 *Dairy effluent: Storage pond sizing*.
- When dairy effluent is stored, some of the solids will settle to the pond floor, which will increase the options available for the type of equipment and systems employed for applying the effluent to land. For example, stored effluent is less likely to cause blockages in pipelines, may be pumped using conventional pumps rather than manure pumps and reduces problems with pathogens.
- Improved disease control can be achieved through the storage of effluent and its strategic application to land during seasons of longer daylight hours.
- Whilst dairy effluent is rich in nutrients and can be used to build up soil fertility, **it is important to soil test regularly** to determine fertiliser application rates or if effluent is sufficient in maintaining the nutrient balance. The balance and levels of nitrogen, potassium and phosphorus vary greatly between dairy effluent and manufactured fertilisers.

The role of ponds is to provide storage and to modify the effluent to suit the equipment employed for reusing it on your pastures.

One pond or two ponds?

- A single pond will allow the solids to settle out and be partly broken down.
- A second pond will contain effluent free of solids and debris that can be easily pumped with a conventional pump. The effluent will also have much lower odour problems and the numbers of harmful bacteria will be reduced.

The number of ponds incorporated into a system should be determined by the reuse planned for the effluent and the equipment that will be used. For example, if effluent is going to be used to wash the dairy yard then two ponds or even three ponds should be used, or if the effluent is to be moved long distances by a pump or by gravity in pipes it may be advantageous to have two ponds.

Alternatively a single pond may be the best system for an irrigation farm where the effluent can be released by gravity from a turkey nest storage into an irrigation channel for shandyng with flood irrigation water.

Key considerations

There are a number of key considerations to be mindful of when designing the effluent system for the dairy shed or feedpad and the application of effluent back to pastures or crops. Sensitive areas like neighbouring properties, waterways, main drains, differing soil types and calving paddocks need to be protected from the site of the effluent system and the planned sites for effluent application.

These key considerations during planning should not only take into account the direct impact of an effluent system but also the potential impacts over time. An example of this is where the pond's odour impacts the neighbouring property over time because of the wind direction.

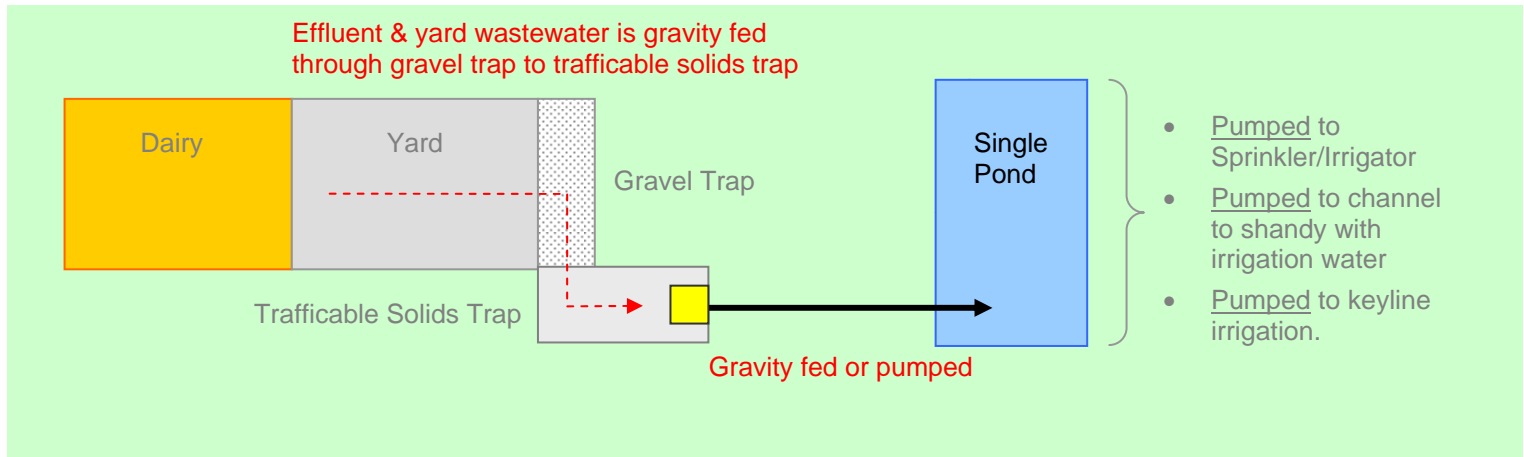
Planning

The design and planning of any effluent system should begin by establishing how and where the effluent will be applied to pastures or crops.

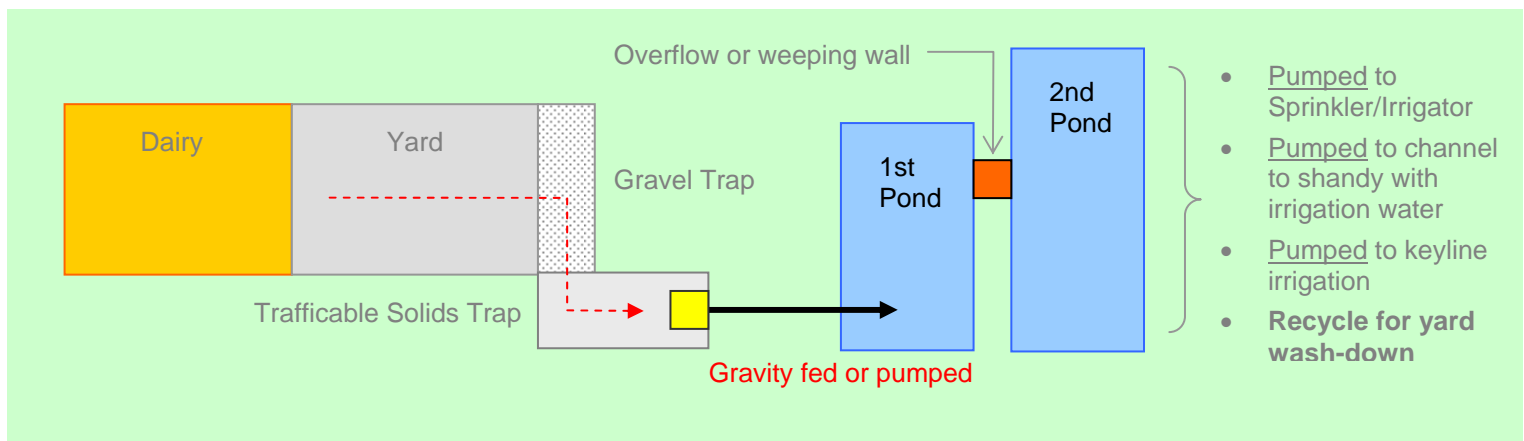
An effluent system should also be designed based on your management resources and limitations.

Contact your local DPI officer to assist with determining application options that best suit your dairy.

a) Single storage pond system



b) Two pond system



c) Turkey nest storage pond system

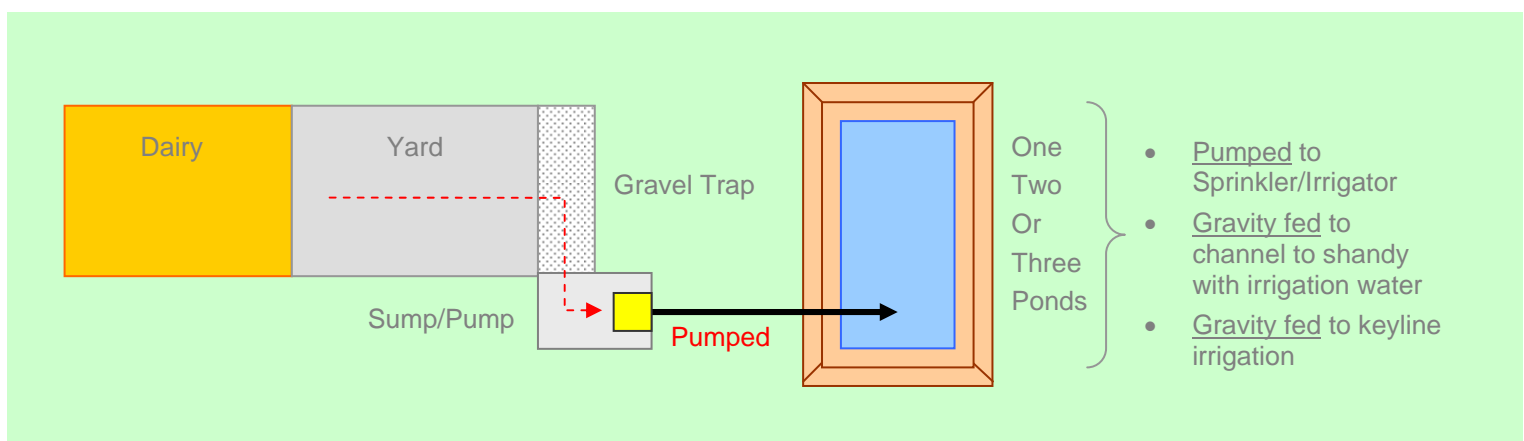


Figure 2: Some methods of treating and storing effluent prior to land application

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