



# Projects 2010-11

## Cork Dairies Obi Obi Creek Laneways Rehabilitation



*Northern laneway on Cork Dairies – Obi Obi Creek in background*

## ON MAINTENANCE REPORT

Project No. 1011-009

## **ON MAINTENANCE REPORT**

This document reports on the implementation phase of the project. It measures the outputs in comparison to the original Project Plan, identifying any shortfalls in outputs which may affect the project outcomes or conversely identifies any additional activities that exceed the Project Plan.

The On Maintenance Report also documents the ‘handing over’ of the project to the landholder, with the project entering the monitoring phase, which in the case of this project continues for a further two years. An important part of the On Maintenance Report is the evaluation of the Implementation phase of the project identifying any issues or concerns encountered and how these were dealt with or resolved. This is particularly important for the evolution of best practice management and methods.

## **BACKGROUND**

Dairy properties are characterised by intensive animal husbandry and land management. Considered to be high risk to water quality, their impacts on the environment and watercourses are complex and proportional to the location in the catchment.

Dairy properties are generally:

- Subject to intensive grazing – usually following the cell grazing method
- Large properties that have substantial lengths of waterways
- Due to the nature of milk quotas are unable to de-stock during the low pasture growth, dry, cool periods of the year
- Reliant on the heavy application of fertiliser
- Have high livestock movement throughout the property
- Often on moderate to steep slopes
- Require good access to water – either numerous natural or off stream watering points
- Milking sheds require large volumes of water to maintain clean and sanitary facilities resulting in large and potentially complex effluent disposal
- Can require high use of chemicals (pesticides, veterinary) for livestock health
- High use of herbicides to manage property weeds and maximise pasture/forage
- Dairying industry inflexible and currently low pricing structure results in less farm income with less priority given to ‘unnecessary’ property management (environmental considerations)
- Labour costs increasing without corresponding milk price increases impacting on farm management

The Cork Dairies property was identified (Baker, 2011) as a high risk to catchment water quality due to its herd size (280 milkers plus juveniles and dry cows), proximity to Obi Obi Creek (with approximately 2 km of frontage), partial riparian fencing and lack of effective buffers and dairy effluent management, (no disinfection and likely discharge to waterways in high rainfall events).<sup>1</sup>

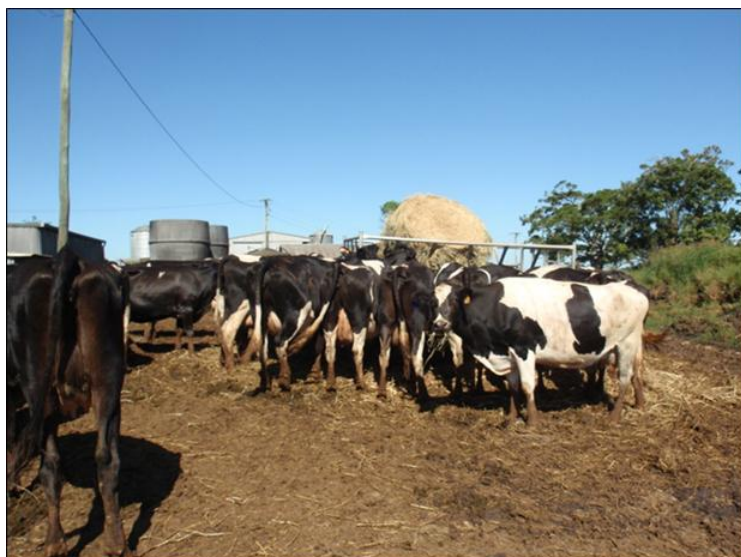
Cork Dairies is the largest dairy property in the Lake Baroon catchment milking 280 cows - down from 300 twelve months ago due to milk quota reductions by National Foods. This has substantially impacted on profitability with at least two other dairy farms in the catchment recently ceasing operations.

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<sup>1</sup> Baker, D. 2011 Sanitary Survey of Somerset and Obi Obi Catchments, ALS Global

An estimated 80% of sediment and 35% of nitrogen in the waterways in South East Queensland come from non-urban diffuse loads. Modern agricultural activities have been identified as a major source of diffuse pollutants into waterways. Land management practices, such as stocking rates, grazing pressures, land clearing and the application of fertilisers have significant impacts on pasture and land condition. These practices can result in erosion processes, decreased infiltration of soils, and excess nutrient and sediment run-off, all of which impact on local water quality.

Providing incentives for landholders to change management practices is a clear strategy to improve water quality<sup>2</sup>.



*Left: The Cork Dairies herd.*

## **PURPOSE & OBJECTIVES**

Cleaner dairy production not only protects the environment but also reduces operating costs, streamlines processes, boosts productivity, and improves sustainability. Maintaining a profitable business in dairy farming is becoming increasingly challenging, with Dairy Deregulation in 2000 and the recent National Foods 30% quota reduction. Most on-farm decisions are made to improve production, however when developing farm infrastructure, significant environmental (and water quality) gains can also be achieved through good design.

Poorly designed or constructed laneways are prone to erosion and pose health risks for the dairy herd. Mud from boggy laneways must be washed from cows before milking, therefore extended wet periods imposes extra labour (and water) burdens. Boggy laneways increases the time taken (and energy expended) to travel between the paddock and dairy (for cows and vehicles). Poor access to grazing pastures, particularly during wet periods, limits efficient pasture use which can have a detrimental effect on run-off (overgrazed paddocks increases nutrient and sediment run-off). Carefully designed laneways are shaped with strategic cross drainage (whoa-boys) to shed water to the sides (onto pasture) rather than directly down the laneway.

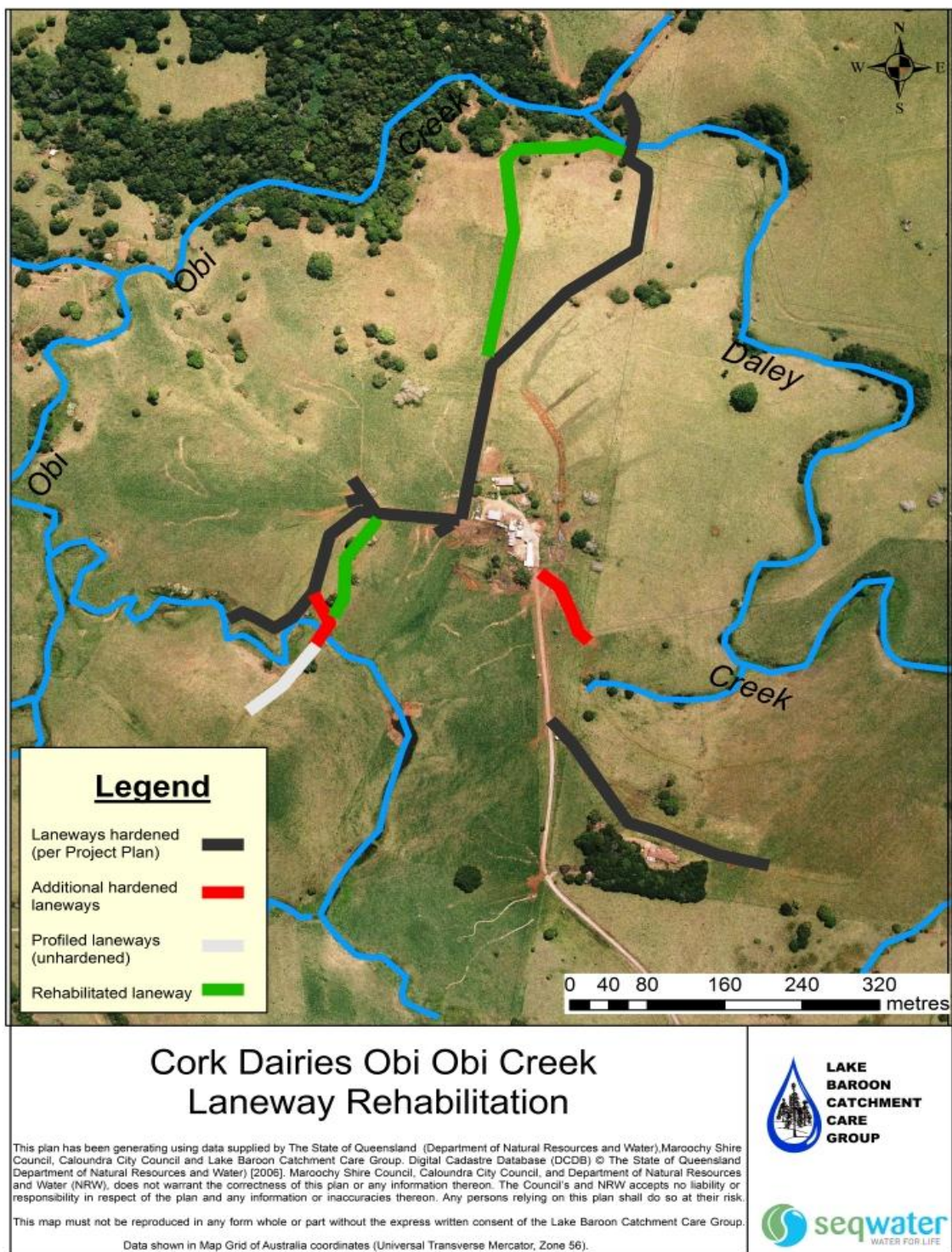
The farm environment is greatly improved by hardening laneways, not only because erosion is minimised but also cows tend to move faster between paddock and dairy resulting in less manure deposited on laneways, lessening the risk of nutrients directly entering drainage lines and watercourses.

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<sup>2</sup> Department of Environment and Resource Management, *Development of a water quality metric for south east Queensland*, 2010



## IMPLEMENTATION



*Above: Planned activities and actual project outputs.*



## **LANEWAY REHABILITATION METHODS**



As per standard practice, laneways are profiled by grading, shaping the surface to provide a free-draining ‘crown’ and preparing the surface for the addition of the minimum amount of road base. Undulating surfaces use excessive volumes of road base resulting in an uneven layer of road base and significantly adds to the cost.



Road base is placed on the laneway surface at approximately 150 mm thick and compacted to a 100 mm surface with a vibrating roller. It is important that moisture levels are suitable to not only allow precise grading of laneway surfaces and spreading of the road base, but especially during the compaction process to achieve a hard, durable surface that resists erosion that does not damage livestock hooves.



Where long steep sections of laneway are unavoidable, ‘whoa-boys’ or diversion banks are placed at regular intervals across the laneway to direct flows way from the surface onto adjacent pasture. This prevents scouring of the laneway surface and also redirects manure deposited on the laneway onto grass where it can be filtered, rather than flowing directly to watercourses.

Due to the large herd size of the Cork property, the laneways were constructed at a width of four metres (rather than the standard three metres on smaller properties).

Rehabilitated laneways significantly reduce erosion – particularly during periods of heavy rainfall. Laneways contribute large volumes of sediment along with nutrients and potentially pathogens to adjacent waterways.



It is important when rehabilitated, livestock use the laneways. Fencing will be erected on all laneways (where required).

*Left: The laneway rehabilitation procedure.*

## **PLANNED ACTIVITIES**

### **NORTHERN LANEWAY**

The northern laneway is the longest laneway on the property connecting the dairy to the properties northern-most paddocks. Recently the neighbouring Thomas property on the Cork's northern boundary has been agisted to run juvenile and dry stock – further raising traffic on the laneway. Significantly this laneway crosses both Daley and Obi Obi Creeks – the focus of further works scheduled for late 2011-12.

The existing laneway traversed very steep slopes parallel to Obi Obi Creek and suffered from significant erosion and impacting on the adjacent waterway. Notwithstanding access and safety concerns, it was deemed more suitable to shift the laneway further to the east, following a gentle contour across the paddock, meeting up with the existing crossing over Daley Creek.

With the relocation of the laneway this has altered paddock layout and potentially access to water. Once the next stage of the project (crossing construction) is completed, off stream watering will need to be considered.



*Left: The northern laneway at the dairy before works. Note the severe erosion and the formation of rilling which directs run-off down the laneway further exacerbating erosion and results in run-off directly to the properties watercourses.*



*Left: The northern laneway following rehabilitation. This section was completed in September 2011. Grass growing on the laneway must be sprayed to avoid damage to the surface.*





*Left: The northern laneway prior to works. Poor drainage causing severe waterlogging. This section of laneway has been abandoned in favour of construction of a new laneway to the east following the contour and reducing the steepness of the laneway.*



*Left: The new section of laneway following the contour and minimising steepness. The northern laneway.*



*Left: Bottom section of northern laneway. Note Daley Creek in the centre of the photo. Grass needs to be managed on the laneway surface.*

## **WESTERN LANEWAY**

The western laneway services the paddocks to the west of the dairy. Significant erosion over several years has left this laneway severely degraded with a cattle trough undermined and where the laneway meets the concrete dairy apron a sharp and deep drop-off.

The western laneway, after splitting into four, continues in a southerly direction to service the south western paddocks, dropping steeply to another crossing over Obi Obi Creek. This section of the laneway has been abandoned in favour of a less steep gradient.



*Left: The western laneway prior to the project. The laneway has eroded to the point where it traps and holds water resulting in an excessively boggy surface.*



*Left: The western laneway profiled and hardening to create a free draining durable surface.*





*Above: Undermined livestock water trough in the western laneway prior to works.*



*Above: The western laneway rehabilitated. The dairy is in the background of the photo.*



*Left: Rehabilitated western laneway where it splits off into paddocks.*



*Above: The location of a new laneway to replace a steep, severely degraded section.*



*Above: New laneway.*

## **EASTERN LANEWAY**

The eastern laneway services the paddocks to the eastern side of the property. This laneway was less formal with livestock traversing a wide path across the slope – leaving many deep ruts.

The formalisation of the laneway has significantly reduced ‘tracking’ – even with the fencing yet to be completed.



*Left: The eastern laneway from the dairy entry road prior to works. Note the poor drainage.*



*Left: Rehabilitated eastern laneway.*



## **ADDITIONAL ACTIVITIES**

### **OBI OBI CREEK CROSSING**

The property has extensive frontage to the Obi Obi Creek with an approximate length of two kilometres. The western laneway crosses the waterway. This crossing was upgraded with two 600 mm pipes and hardened surface. Further profiling of the laneway beyond the crossing was completed to improve access. These works were completed at the landholder's cost.



*Left: Rehabilitated crossing over the upper Obi Obi Creek.*

### **FURTHER LANEWAY HARDENING**

Over the life of the project (planning commenced in January 2011) a short laneway (100 metres) running from the dairy to a paddock to the east (unrelated to the 'Eastern laneway'), became degraded. This laneway was rehabilitated.



*Left: New laneway.*

## **PROBLEMS ENCOUNTERED**

The extremely wet summer of 2010-11 severely degraded the properties' laneways prompting the laneway rehabilitation project. Laneway rehabilitation can only be attempted in winter and spring when soil moisture is ideal and the threat of heavy and prolonged rainfall is unlikely.

Although commenced in August 2011 when conditions should have been ideal, unfavourable conditions persisted, hampering construction. Although rainfall was not excessive during the implementation period, the several attempts to complete works were disrupted leading to the abandonment of works for 2011. The following wet summer of 2011-12 meant the completion of activities was not possible until May 2012.

Further affecting the ability to complete the project was the loss of experienced operators from Sommer Bros Earthmoving to the North Queensland mines.

When profiling the eastern laneway, large 'floating' rocks were encountered which required individual removal. Fortunately the landholder's eight tonne excavator was utilised to remove these.

## **MONITORING**



*Above: Seqwater event monitoring trailer.*



*Above: Seqwater WQ scientist Andrew Smolders and LBCCG volunteer 'grab' sampling.*

The project has been regularly monitored through photo-points and regular visits before, during and following construction to ensure successful implementation.

The wet summer of 2011-12 caused minor damage to the incomplete laneways – particularly the northern laneway which did not have adequate 'whoa-boys' installed, allowing flows to scour a section at the bottom of a relatively steep slope.

Additional to LBCCG monitoring, Seqwater Water Quality scientists have been monitoring the Obi Obi Creek at the downstream end with an event monitoring trailer and a sonde as a control point upstream. Although this monitoring is primarily designed to gather baseline data before the construction of the crossings on the Obi and Daley Creeks (Cork Dairies Obi Obi Creek Riparian Restoration), the information collected can also be used to evaluate the improvements in water quality delivered by the project.

Monitoring will continue until the project ends in June 2014. All works will be monitored to ensure they are maintained and become an integral part of the properties' infrastructure, providing water quality benefits into the future.



## **WHAT HAVE WE LEARNED?**

Laneway hardening projects can only be successfully implemented when weather conditions permit. Ideal soil moisture is required to profile laneways and enable correct compaction of road base.

Setting inflexible time schedules should be avoided as completing laneways when conditions are not favourable can lead to infrastructure that performs poorly and has a short life span thereby wasting investment and resources, and damaging good client relationships.

Although the project could have been completed earlier by engaging a different contractor, LBCCG persisted with Sommer Bros Earthmoving as they have demonstrated in the past they produce high quality work at fair pricing. The owner of Sommer Bros Earthmoving owns a dairy farm in the neighbouring Mary River catchment and has hardened his laneways over several years, refining the method that produces a durable and cost effective surface. Additionally Sommer Bros Earthmoving operates the quarry that produces the ideal road base that is required to harden laneways.

## **NEXT STAGE**

With the laneway rehabilitation completed on the property, the next project is to construct two waterway crossings – a major crossing over Obi Obi Creek to replace a severely degraded livestock crossing, and a low level crossing over Daley Creek.

Additionally fencing will be erected to manage livestock access to the riparian zone of Obi Obi Creek and ensure livestock use the newly constructed crossing rather than randomly crossing the waterway as currently occurs.



*Left: 1.8 metre pipes purchased by the landholder to construct major waterway crossing on the Obi Obi Creek – in background.*

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