

# INNOVATION PROFILE



## BUSINESS SNAPSHOT

### OWNERS

Dave & Rikki Allen

### PROPERTY NAME

Nullogoola Station

### PROPERTY LOCATION

45km west of Cobar, NSW

### SIZE OF PROPERTY

16,006 hectares

### BRIEF ENTERPRISE DESCRIPTION

Grazing sheep

### NUMBER OF PEOPLE WORKING IN THE BUSINESS

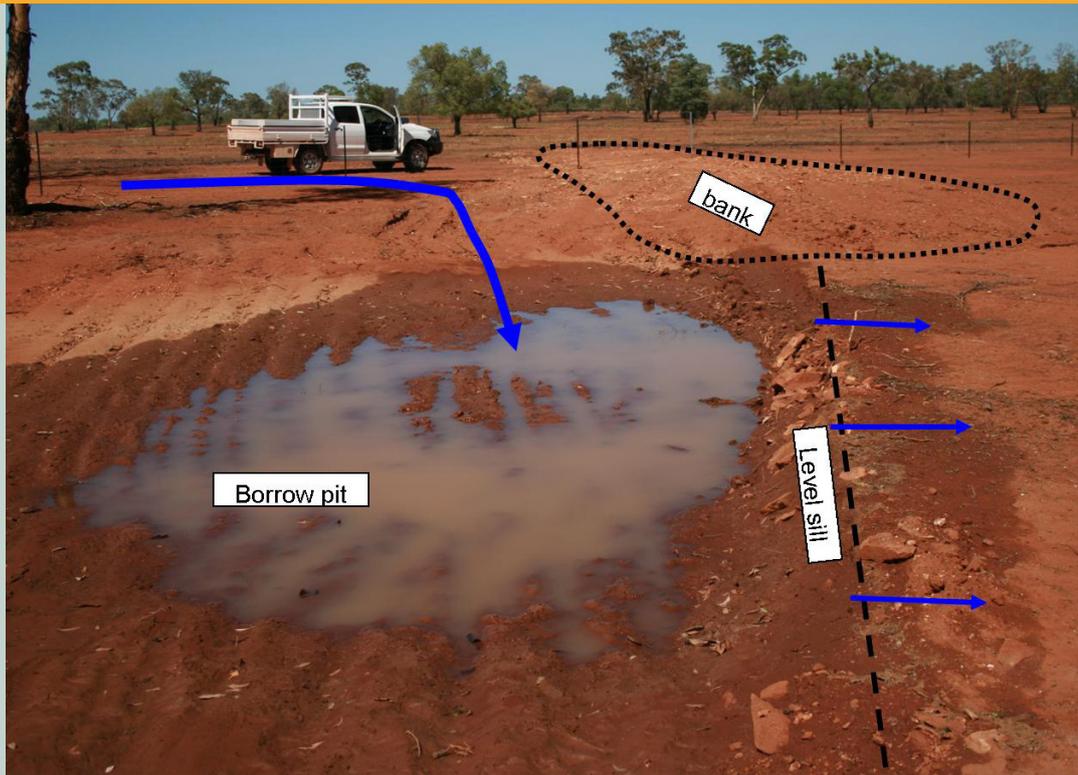
2 full time equivalents

### AVERAGE ANNUAL RAINFALL

400mm

### WHY THIS IS A PASTORAL ZONE INNOVATION

Erosion in the pastoral zone creates gullies and can make the land hard to use for grazing, difficult to drive across and erodes fence lines. Erosion control structures along tracks and fence lines protect the infrastructure from erosion damage as well as re-instating the natural water flow.



## Erosion control along tracks and fence lines

Dave and Rikki Allen have owned Nullogoola since 2010 and recognised that the infrastructure was too poor to run sheep on. The property needed an upgrade so they focused on improving fences and increasing the productivity of the land.

The erosion issue is large as there are hundreds of kilometres of tracks, roads, fence lines, pipelines and powerlines across Nullogoola Station. Water flow is interrupted by infrastructure and causes washouts and gullies.

This innovation is a new way of erosion control that addresses all of the common issues. Ongoing maintenance of fence lines is reduced, washouts don't occur and they aren't creating erosion elsewhere.

Figure 1: A recently constructed area with bare ground, particularly in the borrow pit.

## WHAT WAS THE MOTIVATION TO CHANGE?

Previously when washouts occurred along fence lines the Allen's would hang logs or mesh under the fence to block holes. They graded the area by putting dirt into the washout; however, this would wash away in the next rain, still leaving gaps under the fence.

Hanging logs or mesh under fences to block washouts doesn't do anything to stop erosion. In these cases, erosion continues with the washouts getting bigger.

Most erosion controls along tracks are designed to protect the infrastructure without regard to how it impacts on the landscape. "V" drains are used to take water away from the fence line; however, that usually causes a gully at the bottom of the drain. Also, the water often flows past the inlet of these "V" drains, making them ineffective.

The new way of erosion control addresses all of the above issues. On-going maintenance of fence lines is reduced, washouts are reduced and they aren't creating erosion elsewhere.

When the Allen's are upgrading or replacing fences, they want to do it once and properly the first time. They don't want to keep coming back and repairing washouts along fences.

Dave attended an erosion control workshop held by the Western Catchment Management Authority in October 2011 and applied the techniques taught at that course.



## THE FINAL WORD

"It's worth it in the long run to take the time to protect the fences and tracks."

## HOW DOES THE INNOVATION WORK?

When the Allen's are constructing new fences or renew old fences, they look at areas that are prone to washouts and gullies. These are usually areas with gentle to steep slopes. They start at the top of the slope and construct the first erosion control structure and work down the slope, placing one every 100 – 200 metres.

1. A pit is dug with the downhill edge of the pit being level (ie. on the contour).
2. This edge is a level sill and is about 10 – 15m long.
3. The dirt from the pit is used to construct a bank across the fenceline, which intersects any water flows along the fence line.
4. This bank is sloping towards the pit at 0.2% slope so that the water from the fenceline is directed into the pit.
5. Once the pit is full, the water flows out on the level sill on a broad front. The natural water flow is re-instated and the energy has been taken out of the water.

## KEY FEATURES

The key feature of this innovation is that this new system catches all the water. It releases the water on a broad, level sill which reduces the energy of the water. The fence line is protected and no erosion occurs.

The innovative design and construction of the erosion control re-instates the natural water flows without causing further erosion in the process.

## WHAT ARE THE KEY BENEFITS?

Some key benefits that the Allen's have identified include the long-term time savings. While there is extra time required to initially construct the erosion control structures, it saves a lot of time down the track repairing holes under fences.

Dave and Rikki have been constructing these banks along any new fences since early 2012. They have seen the benefits of reduced maintenance and fewer washouts along the fence lines.

Bestprac acknowledges the contribution of Paul Theakston, Senior Land Services Officer, Rangelands Rehabilitation, and Dave and Rikki Allen in the development of this innovation profile.

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## KEY RESOURCES REQUIRED FOR THE INNOVATION

Dave and Rikki have a loader to construct the banks. They finish them off with the grader to make them smooth enough to drive over and easier to construct the fence over.

In addition, they use the staff from the Western Local Land Service for advice. Staff like Paul Theakston advises on where to place the banks, help in surveying them and supervise construction.

## POTENTIAL CAUTION

Hitting the dirt humps at speed can be dangerous. They are particularly hard to identify after vegetation grows back. After constructing the banks, Dave advises to put a sign or marker to warn people to drive carefully over them.

## WHAT COULD BE DONE DIFFERENTLY NEXT TIME?

In areas that are prone to erosion such as steep and long slopes, Dave would put more banks in and reduce the spacing at less than 100 metres.

Dave and Rikki would also put them in before they install or upgrade the fence lines.

## LOOKING FORWARD

From here, Dave and Rikki will continue to update the fencing infrastructure and place these erosion control structures along the fence lines. Furthermore, they are implementing a rotational grazing system which involves more fencing. This makes doing the fencing right the first time even more important.

## COST BENEFIT ANALYSIS

It takes longer to prepare fence lines and finish fencing; however, it reduces fences washing out and reduces erosion along the access track. There's also less maintenance in the long term.

Figure 2: The impact on a pastoral property 18 months after construction, with the borrow pit mostly rehabilitated.