Department of Agriculture and Food
GOVERNMENT OF WESTERN AUSTRALIA

Infonote RANGELANDS

COST OF REGENERATION AT LARRAWA

The costs below are based on on-ground works completed between 2009 and 2011. An area of approximately 20 ha was used for the demonstration. A diversification permit to carry out these activities cost $250.

Surveying

Surveying ponds was done manually, i.e. on foot with staff and a laser level. It took approximately 12 hours to survey 89 ponds. The cost of a professional to survey the area and mark out ponds is unknown; as surveying was completed by Ray Thompson (Central West Catchment Management Authority) at no charge. The cost to hire a laser level per day was $50.

Survey time could have been reduced if modern techniques such as a vehicle mounted receiver were used. However, due to the small scale of the demonstration area, the added expense of transporting such equipment to Larrawa could not be justified.

Cost to build water ponds and water spreader banks

Water ponds

Table 1 **Data collected for a 16G and 12G grader**

	16G	12G
Machine cost per hr (with operator & without fuel)	$175.00	$150.00
Diesel used per hour (litre)	22.5 L	22.5 L
Median cost to build pond per metre	$.32	$1.49
Approx. cost to build 210 m pond	$67.00	$312.90

Other

- Cost to construct a pond includes x2 rips along borrow area and x2 rips inside of pond.
- Cost of diesel was $1.48/litre.
- Ferry of 16G to Larrawa from Kununurra was $1000 each way (not included in above costs).
- Average pond length for 16G was 244 metres.
- Forage sorghum seed (Sweet Jumbo) cost $7.26/kg, approximately 2 kg used per ha.

The estimated cost to build two ponds on 1 hectare is:

- Surveying (not included).
- x2 ponds at $67 each.
- 2 kg of forage sorghum seed was $14.52.

Total cost is $148.52 per hectare (construction, ripping and seeding).

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Water spreader banks

Two water spreader banks were constructed during November 2011 with a 16G machine.

Table 2 **Summary of data collected from 16G, building x2**

Water spreader No.	Length (m)	Construct time (min.)	Cost to build ($)	Cost to build/metre ($)	Comment
1	270	135	465.75	1.73	Ripping (x2)
2	250	90	310.5	1.24	Ripping (x2)

Water spreader banks were surveyed on the boundary where the vegetated landscape stopped and scalds began. Water spreader banks at Larrawa were not designed to pond water but to slow down overland flow and spread water out before it reached the ponds further down slope. The cost to build a water spreader bank was approximately $1.49/m and the cost to build a water pond was $0.32/m. The higher cost of water spreader bank construction is due to bank dimensions (see Table 3). It is believed the average cost (time) to build a water spreader could have been significantly reduced if more water spreaders were built, resulting in more experience being gained. Water spreader banks have been built for $0.70/m in the Nyngan area of NSW.

Table 3 **Open pond and water spreader bank dimensions**

	Height	Bank base width
Open pond	60 cm	2 m
Water spreader	60 cm	3 m

Other techniques trialled

Opposed disc and crocodile plough

Both the opposed disc and crocodile plough were pulled by a 70 hp tractor. The opposed disc plough was used in 2009 to build water ponds. Ponds were surveyed along the contour line, designed to pond 5 cm of water, and were on average 30 m long and constructed to a height of 40 cm. Post the 2009/10 wet season (well above average), only a few ponds held water – the majority had blown out; too much water. It was concluded that the opposed disc plough was unsuitable for water pond construction at the demonstration site due to the higher grade slopes.

The crocodile plough was also trialled in 2009. The benefit of using the crocodile plough was that no surveying was required. An operator could simply hook-up and drive off. Due to the hard surface crust of the demonstration area (up to 15 cm) the crocodile plough was unable to delve into the soil and create a large enough divot. Ideally divots would have been the size of a rockmelon, however the crocodile plough only managed a small divot about the size of a cricket ball. Post the 2009/10 wet season, there was no difference in perennial or annual groundcover between the area that had been rehabilitated with the crocodile plough and the control area which was not rehabilitated. It is believed the crocodile plough could be more suited to softer soil types, for example, river frontage.

Key knowledge gained

- **A 16G was more economical than a 12G to build water ponds – won more dirt per pass.**
- **Banks built with the opposed disc plough were too small to be effective at ponding water.**
- **Surveying for ponds is best completed by a professional experienced in surveying ponds.**
- **An experienced machine operator is essential to get full value out of 'machine hire'.**