Manuherikia Catchment - Budget Descriptions

Capital cost background

There have been three proposed dam options presented. The capital costs for each option are currently based off the pre-feasibility estimates and will be updated once revised costs for the three options are completed by Golders in September 2014.

The funding model for the capital costs is based on 50% equity funding by farmers and 50% debt funding by the irrigation scheme, with this debt serviced and principle repaid through annual water charges over a 35 year period. There are a significant number of cost options depending on what race the landowners currently take water from.

Option 1)

This involves strengthening the existing Falls Dam and raising it by a further **5 metres**, which would provide greater reliability to the existing water users.

Our models are based on a proposed initial cost to farmers of $1248/ha, with an ongoing annual cost of $168/ha. This option would improve the reliability of water for current users, however, it wouldn't bring any further land under irrigation.

Option 2)

The **15m option** would involve building a new dam, which would be 15 meters taller than the current dam height. This option would improve the reliability for current users and bring in some more land for irrigation. The capital costs for new water users have been estimated at $3436/ha initially, with an ongoing charge of $364/ha.

Option 3)

The final option is to build a new dam **27 metres** higher than the existing falls dam. This option would open up a whole new area for water with high reliability. Due to the economies of scale of this option, the costs would be less than the 15m option for new users, at $2734/ha initially with ongoing cost at $288/ha.

Farm systems budgets

Financial analysis has been based on a farming system with an effective area of 400ha. This is analysing the farming systems under existing flood irrigation, compared to their potential under more efficient forms of irrigation. The irrigation and infrastructure costs which will be incurred through the change in farming systems have also been considered. Due to farm layout, contour and existing infrastructure, each individual farm will have varying capital costs. While efforts have been made to make these models as relatable as possible, users should seek their own advice on how their farm could benefit from the potential changes.

Existing Flood Irrigated Sheep Farm

This farm is a flat to undulating property which utilises wild flood and boarder dike forms of irrigation. A sheep breeding system is operated which finishes all its own lambs to 17.5KgCW. The farm is stocked at an average of nine sheep per ha (10.4 SU/ha) grazing Romney ewes which lamb at 130% STS.

SHEEP BREEDING					
REVENUE	**No./ha avlb.**	**Price**	**Weight**	**$/ha**	**Total**
Lamb	3,540	$5.30	17.5	821	$328,335
Cull Ewes	426	$75.00		80	$31,950
Wool	15,180	$3.20		121	$48,576
GROSS FARM REVENUE				**1022**	**$408,861**
less Livestock purchases				21	$4,200
NET FARM INCOME				**1001**	**$400,461**
FARM WORKING EXPENSES					
			per SU	per ha	
Wages			4.00	42	$16,672
Animal Health			3.90	41	$16,256
Breeding			0.40	4	$1,667
Shed Expenses					
Electricity			1.80	19	$7,503
Feed			3.20	33	$13,338
Fertiliser			11.00	115	$45,849
Freight			1.17	12	$4,877
Seeds			1.70	18	$7,086
Shearing			4.00	42	$16,672
Weed and Pest			2.88	30	$12,004
Fuel			3.55	37	$14,797
Vehicle			2.37	25	$9,878
Repairs & Maint			5.20	54	$21,674
Rates			2.40	25	$10,000
Communication			0.48	5	$2,000
Insurance			1.25	13	$5,200
Acct, Legal,Cons			1.06	11	$4,400
Administration			0.77	8	$3,200
Depreciation			4.75	49	$19,798
Other			0.19	2	$800
Irrigation	Off Farm		5.76	60	$24,000
	On Farm		4.80	50	$20,000
FARM EXPENDITURE			**67**	**694**	**$277,672**
FARM SURPLUS			**29**	**307**	**$122,789**

Existing Flood Irrigated Dairy Support

This dairy support property operates on a similar land class to the sheep system outlined above. Every year, 680 calves are taken on in December and grazed right through for 18 months before leaving as in-calf heifers, before their second winter. The calves are initially grazed at $7/hd/week until the end of April, they then go onto an $11/hd/week grazing contract for the next 12 months and then increase to $15/hd/week for the 4 weeks of the following May. The following table shows the profit and loss on a per hectare basis.

DAIRY SUPPORT			
REVENUE			
Calves			**214**
R1yrs			**972**
R2 yrs			**102**
TOTAL REVENUE			**1,289**
FARM WORKING EXPENSES			
		per ha	
Wages		150	60,000
Animal Health		1	400
Breeding			-
Shed Expenses			-
Electricity		19	7,503
Feed			
Fertiliser		200	80,000
Freight		11	4,400
Seeds		31	12,400
Shearing			-
Weed and Pest		18	7,200
Fuel		33	13,200
Vehicle		25	9,878
Repairs & Maint		50	20,000
Rates		30	12,000
Communication		5	2,000
Insurance		11	4,400
Acct, Legal,Cons		11	4,400
Administration		8	3,200
Depreciation		49	19,798
Other		2	800
Irrigation	Off Farm	60	24,000
	On Farm	50	20,000
FARM EXPENDITURE			**764**
FARM SURPLUS			**525**

Existing Dryland Sheep Farm

The farm system outlined below is based on the farm having no irrigation, so the whole property is dryland. A half bred sheep system is operated which produces store lambs and mid micron wool. The farm is stocked at 4.4 sheep per hectare with the ewes lambing at 100%. Lambs are sold for $65/hd and wool is sold for $10/kg.

HALF BRED SHEEP DRYLAND					
			$/SU	**$ / Ha**	**Total**
REVENUE	No./ha avlb.	Price			
Lamb	1,168	65.00	45.6	189.80	75,920
Cull Ewes	214	80.00	10.3	42.78	17,114
Wool	7,388	10.00	44.4	184.69	73,876
GROSS FARM REVENUE				**417.27**	**166,910**
less Livestock purchases				3.65	
NET FARM INCOME			**99.4**	**413.62**	**165,450**
FARM WORKING EXPENSES					
			per SU	per ha	
Wages			4.00	16.64	6,655
Animal Health			3.90	16.22	6,488
Breeding			0.40	1.66	665
Shed Expenses				0.00	0
Electricity			1.80	7.49	2,995
Feed			3.20	13.31	5,324
Fertiliser			5.00	20.80	8,319
Freight			1.17	4.87	1,947
Seeds			1.70	7.07	2,828
Shearing			4.00	16.64	6,655
Weed and Pest			2.88	11.98	4,791
Fuel			3.55	14.77	5,906
Vehicle			2.37	9.86	3,943
Repairs & Maint			5.20	21.63	8,651
Rates			6.01	25.00	10,000
Communication			1.20	5.00	2,000
Insurance			3.13	13.00	5,200
Acct, Legal,Cons			2.64	11.00	4,400
Administration			3.00	8.00	3,200
Depreciation			4.75	19.76	
Other			0.48	2.00	800
Irrigation	Off Farm				
	On Farm				
FARM EXPENDITURE			**60.38**	**246.67**	**98,670**
FARM SURPLUS			**40.14**	**166.95**	**66,780**

Efficiently Spray Irrigated Sheep Farm Model

This model is an example of a farm system which could be operated on a 400ha property if it was developed to utilise efficient forms of irrigation, such as spray. It is based on a sheep breeding and finishing system in which the lambs bred on the property are finished to 19KgCW and sold for $5.30/KgCW. The farm is stocked at 17.1 sheep per ha with the ewes lambing at 140% STS. Half of the hoggets are mated which lamb at 90%. An extra 4000 trade lambs are finished on the excess summer pasture.

		SHEEP BREEDING & FINISHING			
REVENUE	**Total Number**	**Price**	**Weight (Kgs)**	**$ / Ha**	**Total**
Own Bred Lambs	7353	$5.30	19.00	1,851	740,447
Traded Lambs	4000	$20.00		200	80,000
Cull Ewes	836	$75.00		157	62,730
Ewe Wool	5700	$3.50	4.50	224	89,775
Hoggets Wool	1140	$3.50	2.80	28	11,172
Lambs Wool (half shorn)	5677	$4.20	1.50	89	35,762
GROSS FARM REVENUE				**2,550**	**1,019,886**
less purchases				20	7,980
NET FARM INCOME				**2,530**	**1,011,906**
FARM WORKING EXPENSES					
			per SU	per ha	
Wages			9.00	178	71,290
Animal Health			4.00	79	31,684
Breeding			0.40	8	3,168
Shed Expenses				-	-
Electricity			3.50	69	27,724
Feed			5.00	99	39,606
Fertiliser			12.62	250	100,000
Freight			0.76	15	6,000
Seeds			2.80	55	22,179
Shearing			4.00	79	31,684
Weed and Pest			1.50	30	11,882
Fuel			3.00	59	23,763
Vehicle			2.40	48	19,011
Repairs & Maint			3.20	63	25,348
Rates			2.02	40	16,000
Communication			0.25	5	2,000
Insurance			0.76	15	6,000
Acct, Legal,Cons			0.56	11	4,400
Administration			0.56	11	4,400
Other			0.20	4	1,600
Total			**56.52**	**1,119**	**447,739**
Depreciation			5.05	100	40,000
Total			**61.57**	**1,219**	**487,739**
Irrigation	Off Farm		8.47	168	67,127
	On Farm		10.10	200	80,000
FARM EXPENDITURE			**80.15**	**1,587**	**634,866**
FARM SURPLUS				**943**	**377,040**

These two tables show the potential costs to convert the 400ha property from either the flood irrigated sheep or dryland sheep system. The cost of capital is based on 7%. The purchasing of the water shares is at the higher 27m price for the dryland model, because those farms do not presently hold any shares in the current irrigation companies.

Conversion Costs from Flood Irrigated sheep to spray irrigated sheep				
Item			**$ / ha**	**Total**
Clean Up			150	60,000
Irrigation System			4,500	1,800,000
Cow Shed			0	0
Electricity			250	100,000
Housing			0	0
Other Buildings			100	40,000
Fencing and Lanes			200	80,000
Stockwater			150	60,000
Fertiliser			200	80,000
Regrassing			300	120,000
Machinery			150	60,000
Net Livestock			810	324000
Gross Total			**6,810**	**2,724,000**
Water Shares			1248	499,265
Total			**8,058**	**3,223,265**
Debt Servicing Cost			564	225,629

Conversion Costs from Dry sheep to irrigated sheep				
			$ / ha	**Total**
Clean Up			200	80000
Irrigation System			4,500	1800000
Cow Shed			0	0
Electricity			250	100000
Housing			0	0
Other Buildings			100	40000
Fencing and Lanes			250	100000
Stockwater			200	80000
Fertiliser			300	120000
Regrassing			550	220000
Machinery			200	80000
Net Livestock			1272	508800
Gross Total			**7,822**	**3128800**
Water Shares			2734	1093793
Total			**10,556**	**4222593**
Debt Servicing Cost			739	295582

Efficiently Spray Irrigated Dairy Support Farm Model

This model is an example of a dairy support system which could be operated on a 400ha property if it was developed to utilise efficient forms of irrigation, such as spray. The farm is based on 80% of the land being utilised to raise young dairy heifers and the remaining 20% used to winter dairy cows. In December 1024 dairy calves are taken on and grazed through for 18 months. The calves are initially grazed at $7/hd/week until the end of April, they then go onto an $11/hd/week grazing contract for the next 12 months and then increase to $15/hd/week for the 4 weeks of the following May. The winter dairy cow policy involves taking on 1620 MA cows for nine weeks over the winter and grazing them at a rate of $28/week.

Irrigated Dairy Support				
REVENUE				
			Total Price/ha	
Calves			**323**	129,024
R1yrs			**1,464**	585,728
R2yrs			**154**	61,440
Dairy Cow Wintering			**1,020**	408,000
TOTAL REVENUE			**2,960**	1,184,192
FARM WORKING EXPENSES				
			per ha	total
Wages			180	72,000
Animal Health			1	400
Breeding				-
Shed Expenses				-
Electricity			70	28,000
Feed			200	80,000
Fertiliser			250	100,000
Freight			15	6,000
Seeds			54	21,600
Winter Crop			220	88,000
Weed and Pest			35	14,000
Fuel			62	24,800
Vehicle			45	18,000
Repairs & Maint			60	24,000
Rates			40	16,000
Communication			5	2,000
Insurance			15	6,000
Acct, Legal,Cons			11	4,400
Administration			11	4,400
Other			4	1,600
Total			**1278**	**511200**
Depreciation			100	40,000
Total		**47%**	**1378**	**471200**
Irrigation	Off Farm		168	67,127
	On Farm		200	80,000
FARM EXPENDITURE			**1,746**	**698,327**
FARM SURPLUS			**1,215**	**485,865**

The table below shows the potential conversion costs of the 400ha property, from the existing system of flood irrigated dairy support, to spray irrigated dairy support. Cost of capital has been budgeted at 7%.

Conversion Costs from Dairy Support to Dairy Support				
Item			**$ / ha**	**Total**
Clean Up			350	140,000
Irrigation System			4,500	1,800,000
Cow Shed				0
Electricity			300	120,000
Housing				0
Other Buildings			150	60,000
Fencing and Lanes			200	80,000
Stockwater			350	140,000
Fertiliser			200	80,000
Regrassing			300	120,000
Machinery			250	100,000
Livestock				0
Gross Total			**6600**	**2,640,000**
Water Shares			1248	499,265
Total			**7,848**	**3,139,265**
Debt Serv. Cost on Conv.			549	219,749

Efficiently Spray Irrigated Dairy Farm Model

This model is an example of a dairy system which could be operated on a 400ha property if it was developed to utilise efficient forms of irrigation, such as spray. The farm is based on a stocking rate of 3.2 cows per ha producing 1315MS/ha. All young stock are grazed off and the cows are wintered off the property. An average milk price of $6.50/KgMS is used and farm working expenses accumulate to $4.63/KgMS.

Dairy Farming System			
REVENUE	1,315	per kgMS	$/ha
Milksolids		$6.50	8548
Cattle net of Purchases		0.35	460
Other		0.02	26
GROSS FARM REVENUE		**6.87**	**9035**
Livestock Purchases		0.02	26
NET FARM REVENUE		**6.85**	**9009**
FARM WORKING EXPENSES			
		per MS	per ha
Wages		0.75	986
Animal Health		0.20	263
Breeding		0.10	132
Shed Expenses		0.05	66
Electricity		0.18	237
Feed		1.33	1749
Fertiliser		0.50	658
Freight		0.05	66
Seeds		0.05	66
Shearing			0
Weed and Pest		0.03	39
Fuel		0.08	105
Vehicle		0.08	105
Repairs & Maint		0.35	460
Rates		0.04	53
Communication		0.02	26
Insurance		0.06	79
Acct, Legal,Cons		0.05	66
Administration		0.03	39
Other		0.06	79
Total		**4.01**	**5274**
Depreciation		0.34	450
Total		**4.35**	**5724**
Irrigation	Off Farm	0.13	168
	On Farm	0.15	200
FARM EXPENDITURE		**4.63**	**6091**
FARM SURPLUS		**2.22**	**2917**
less Debt Servicing		1.08	1414
NET FARM SURPLUS AFTER DEBT SERVICING		**1.14**	**1503**

These tables show the potential costs which would be incurred if the property was converted from either sheep breeding or dairy support. Livestock costs do vary between the two options since the sell down of the capital ewe flock in the sheep model would offset the purchase of the dairy cows.

CONVERSION COSTS going from Dairy Support to Dairy		
Item	**MS**	**$ / ha**
Clean Up	0.38	500
Irrigation System	3.42	4,500
Cow Shed	3.04	4,000
Electricity	0.53	700
Housing	0.61	800
Other Buildings	0.06	75
Fencing and Lanes	0.38	500
Stockwater	0.30	400
Fertiliser	0.23	300
Regrassing	0.42	550
Machinery	0.57	750
Net Livestock	3.92	7,354
Gross Total	**15.53**	**20429**
Plus Water Shares (1 for 1 ha)	0.95	1248
Total	**16.48**	**21,677**
Debt Serv. Cost on Conv.	1.09	1430
Debt Serv. Cost on Water Shares	0.07	87
Total DS	**1.15**	**1517**

CONVERSION COSTS going from S&B to Dairy		
Item	**MS**	**$ / ha**
Clean Up	0.38	500
Irrigation System	3.42	4,500
Cow Shed	3.04	4,000
Electricity	0.53	700
Housing	0.61	800
Other Buildings	0.06	75
Fencing and Lanes	0.38	500
Stockwater	0.30	400
Fertiliser	0.23	300
Regrassing	0.42	550
Machinery	0.57	750
Net Livestock	3.92	5,874
Gross Total	**14.41**	**18949**
Plus Water	0.95	1248
Total	**15.36**	**20,197**
Debt Serv. Cost on Conv.	1.01	1326
Debt Serv. Cost on Water Shares	0.07	87
Total DS	**1.08**	**1414**

Summary Tables

The results for the budgets above have been summarised in the table below. It shows what the farm surplus would be for each of the new systems, under the two scenarios of the 5m dam or the 27m dam.

FINANCIAL SUMMARY								
	Existing Systems				New Systems			
	Mixed Arable	Sheep Breeding	Dairy Support	Dryland Half-Bred Sheep	Dairy	Mixed Arable	Sheep & Breeding Finishing	Dairy Support
Total Revenue	$1,726	$1,001	$1,289	$414	$9,009	$3,531	$2,530	$2,960
Farm expenses	$1,142	$584	$654	$247	$5,724	$2,055	$1,219	$1,378
FE as % TR	*66%*	*58%*	*51%*	*60%*	*64%*	*58%*	*48%*	*47%*
On Farm Irrigation Expense	110	110	110		$200	$200	$200	$200
Off Farm Irrigation Annual Cost 5m					$168	$168	$168	$168
Off Farm Irrigation Annual Cost 27m					$288	$288	$288	$288
Farm Surplus - Existing Systems	**$474**	**$307**	**$525**	**$167**				
Farm Surplus - 5m					**$2,917**	**$1,108**	**$943**	**$1,215**
Farm Surplus - 27m					**$2,797**	**$988**	**$822**	**$1,094**

This table shows the return which could be generated under different conversion scenarios. The 27m dam option would involve bringing in new users from dryland farming to an irrigated system. Therefore, it is assumed that the conversion of these properties would only be from the dryland half-bred sheep systems.

The marginal return is the increase in profit which the new system generates, over and above what the existing system did. The marginal capital is the capital which would be required to be invested, in order to convert to the new farming system. Therefore the return on marginal capital is the extra profit margin as a % of the extra capital invested.

Converting from Flood Irrigation to Spray Irrigation									
	Do Minimum (5m)					27m Option			
Existing System (Flood Irrigated or Dryland)	**Sheep Breeding**	**Dairy Support**	**Arable**	**Sheep Breeding**	**Dairy Support**	**Dryland Halfbred Sheep**			
New System (Spray Irrigated)	**Dairy**	**Dairy**	**Mixed Arable**	**Sheep & Breeding Finishing**	**Dairy Support**	**Dairy**	**Mixed Arable**	**Sheep & Breeding Finishing**	**Dairy Support**
Off Farm Capital Cost	$1,248	$1,248	$1,248	$1,248	$1,248	$2,734	$2,734	$2,734	$2,734
Marginal Return ($/ha)	$2,610	$2,393	$634	$636	$690	$2,630	$821	$655	$927
Marginal Capital ($/ha)	$20,197	21,677	$7,826	$8,058	$7,848	$21,683	$9,312	$9,544	$9,334
Return on Marginal Capital	**12.9%**	**11.0%**	**8.1%**	**7.9%**	**8.8%**	**12.1%**	**8.8%**	**6.9%**	**9.9%**