

FOUR ARROWS ETHANOL PTY LTD : Calculations for sizing aerobic pond/s

Aerobic ponds - V3

Surface Area

Milkers	herd size	7,200	head				
	time on yard	24	hrs/day				
	BOD ₅ loading	0.17	kg/animal/day				
	BOD ₅ loading	70%	pre wash				
	solids removed	0%	sedimentation ponds	Surface area of pond/s	4.90	ha	
heifers	herd size	11,000	head				
	time on yard	24	hrs/day				
	BOD ₅ loading	0.10	kg/animal/day				
	solids removed	0%	pre wash				
		40%	sedimentation ponds	Surface area of pond/s	8.80	ha	
				Total minimum surface area	13.70	ha	
					say	15.0	ha
					prefer	25.0	ha

Source Feedpad guidelines for the Goulburn Broken Catchment (authors RJ Wrigley & C Dillon)
Strategic Bovine Services

Aerobic ponds - V3

Notes

Must contain about 1000 ML
Water may be less than 3m deep
Aeration desirable throughout the year
Wave action more of a problem so need flatter internal batters

Bank

				Key				Dimensions - inside edge at top of bank			
crest width	8.0	m		depth	3.0	m		← pond 1 →		← pond 2 →	
height	3.5	m		base	2.5	m		Side A	700 m @ 100%	0 m @ 100%	
batters				batters				B	500 100%	0 100%	
in 1 in	5.0			A 1 in	3.0			C	700 100%	0 50%	
out 1 in	2.5			B 1 in	3.0			D	500 100%	0 100%	

Earth works

bank	73.9	m ³ /m	length	2400	m
key	34.5		X section	108.4	m ³ /m
	108.4	m ³ /m		260,250	m ³

Internal dimensions @ NSL

pond 1 long	665	m	Total area	
wide	465		310,450 m ²	
pond 2 long	-35		Depth <NSL	
wide	-35		0.84 m	

External dimensions @ NSL

pond 1 long	726	m	Total area	
wide	526		381,901 m ²	
pond 2 long	26			
wide	26			

Water stored @ 1.0 m freeboard
= 3.34 m deep

Above ground 824.0 ML
Below ground 260.3 ML
1084.3 ML

Note to enable borrow from the aerobic storage of 38,900 m³ for fill of same volume in anaerobic storage the floor of the aerobic storage would drop by 0.13m to 0.97m below NSL
Note depth of cut could be reduced further if the the bank width and internal batters are reduced with liner and geotech approval