

Site Details				Notes												
Catchment Area 1	A _{C1}	350	m ²	Pond 5 water balance showing lairage washdown water and hardstand runoff. Modelling shows that dam evaporation factor for impaired water at this location is 1.15, however a conservative evaporation factor of 1 is used in this case. Weather data collected from SILO for grid point (-33.65, 117.50), for 1975-2024.												
Catchment Area 2	A _{C2}	0	m ²													
Catchment Area 3	A _{C3}	0	m ²													
Irrigation Area	A _I	0	m ²													
Wastewater Production	Q _D	32.86	m ³ /day	Pond volume is calculated on a 3-year cycle starting in May, with the first year containing a 1:20 ARI 48-hour storm event. Second and third years use weather data for an average year, with the pond drying out in year 3. 50 years of SILO data is additional safety net in the calculator given the reduction in rainfall over the past 20 years. A default 10% pond safety factor is applied to cater for any solids buildup in the pond. Catchment inflow from a summer storm event in January of the first year assumes a runoff coefficient of 1. All other catchment inflow to the pond consider the monthly runoff coefficient.												
Pond Depth Safety Factor	K _{PA}	10%	[-]													
Pond Area Safety Factor	K _{PD}	0%	[-]													
Pond Freeboard	F	0.20	m													
Dam Evaporation Factor	K _E	1.00	[-]													
Runoff Coefficient (Catchment 1)	K _{R1}	0.28	[-]													
Runoff Coefficient (Catchment 2)	K _{R2}	0.28	[-]													
Runoff Coefficient (Catchment 3)	K _{R3}	0.28	[-]													
Climate Data																
	Symbol	Formula	Units	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
Days in Month	D		days	31	30	31	31	30	31	30	31	31	28	31	30	365
Design Precipitation Rate (year 1)	P		mm/month	55	63	71	60	46	31	25	16	125	16	19	28	556
Design Precipitation Rate (year 2)	P		mm/month	55	63	71	60	46	31	25	16	18	16	19	28	556
Mean Pan Evaporation	E _P		mm/month	62	45	47	60	83	127	171	224	240	193	163	98	1512
Mean Irrigation Rate	E _T		mm/month	0	0	0	0	0	0	0	0	0	0	0	0	0
Average Winter Precipitation	P _W		mm/cycle	55	63	71	60	46	31							0
Wet Year Precipitation & Summer Storm	P _{W,max}		mm/cycle	55	63	71	60	46	31			107				0
Pond Balance																
Year 1 of 3 (wet year)				May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	
Precipitation	Q _P	A _P × (P/1000)	m ³ /month	644	736	835	708	540	359	293	191	1470	186	227	331	
Waste Inflow	Q _M	Q _D × D	m ³ /month	1019	986	1019	1019	986	1019	986	1019	1019	920	1019	986	
Total Catchment Inflow	Q _I	Σ(A _C × K _R × (P/1000))	m ³ /month	7	8	10	5	2	1	1	1	40	2	2	2	
Pond Evaporation	Q _E	K _E × (E _P /1000) × A _P	m ³ /month	728	525	547	701	975	1488	2008	2628	2816	2263	1907	1144	
Irrigation Outflow	Q _O	E _T × A _I	m ³ /month	0	0	0	0	0	0	0	0	0	0	0	0	
Total Pond Water	V _P	Q _P + Q _M +Q _I - Q _E – Q _O	m ³	942	2147	3463	4493	5046	4936	4208	2791	2503	1348	688	862	
Pond Depth	D _{POND}	V _P /A _P	m	0.08	0.18	0.30	0.38	0.43	0.42	0.36	0.24	0.21	0.11	0.06	0.07	
Year 2 of 3																
Precipitation	Q _P		m ³ /month	644	736	835	708	540	359	293	191	214	186	227	331	
Waste Inflow	Q _M		m ³ /month	1019	986	1019	1019	986	1019	986	1019	1019	920	1019	986	
Total Catchment Inflow	Q _I		m ³ /month	7	8	10	5	2	1	1	1	2	2	2	2	
Pond Evaporation	Q _E		m ³ /month	728	525	547	701	975	1488	2008	2628	2816	2263	1907	1144	
Irrigation Outflow	Q _O		m ³ /month	0	0	0	0	0	0	0	0	0	0	0	0	
Total Pond Water	V _P		m ³	1804	3009	4326	5355	5908	5799	5070	3653	2072	917	257	432	
Pond Depth	D _{POND}		m	0.15	0.26	0.37	0.46	0.50	0.49	0.43	0.31	0.18	0.08	0.02	0.04	
Year 3 of 3																
Precipitation	Q _P		m ³ /month	644	736	835	708	540	359	293	191	214	186	227	331	11783
Waste Inflow	Q _M		m ³ /month	1019	986	1019	1019	986	1019	986	1019	1019	920	1019	986	23986
Total Catchment Inflow	Q _I		m ³ /month	7	8	10	5	2	1	1	1	2	2	2	2	125
Pond Evaporation	Q _E		m ³ /month	728	525	547	701	975	1488	2008	2628	2816	2263	1907	1144	35462
Irrigation Outflow	Q _O		m ³ /month	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Pond Water	V _P		m ³	1373	2578	3895	4925	5477	5368	4639	3223	1642	487	0	175	432
Pond Depth	D _{POND}		m	0.12	0.22	0.33	0.42	0.47	0.46	0.40	0.27	0.14	0.04	0.00	0.01	
Outputs																
Minimum dimensions - excluding safety factors and freeboard.							Final Dimensions									
Minimum Pond Area	A _P	ΣQ _P + ΣQ _M + ΣQ _I -ΣQ _E - ΣQ _O = 0	11730	m ²	Required Pond Area				Area	A _P × (1+K _{PA})				11730	m ²	
Minimum Pond Depth	D _{POND,max}	Maximum value of D _{POND}	0.50	m	Pond Depth Including Freeboard				Depth	D _{POND,max} × (1+K _{PD}) + F				0.75	m	
Minimum Pond Volume	V _{P,max}	Maximum value of V _P	5908	m ³	Required Pond Volume				Volume	Area x Depth				6499	m ³	