

LA Desalination Project 2018, Membrane Bank Calculations, 1 BGD

Membrane Footprint Area Ratio 2.5 to 1
 Metric Membrane Flux 1.5 Liter/(sqm*hr*bar)
 Membrane DP 800 psi
 Membrane DP 55.2 bar
 English Membrane Flux 48.8 gal/(sqft*day)

System Membrane Fresh Water Flow 1000 MGD
 System Membrane Surface Area 20.5 million sqft
 Membrane Bank Inside Diameter 160 ft
 Individual Membrane height 50 ft
 Individual Membrane Wall Thickness 2 inches

| Membrane Outside Diameter (in) | Membrane Inner Pipe Diameter (in) | Individual Membrane OD Footprint (sqft) | Individual Membrane ID Footprint (sqft) | Individual Membrane Surface Area (sqft) | Total System Membranes Required | Total System Membrane Bank Footprint (sqft) | Membrane Inner Pipe Exit Velocity (ft/min) | Membrane Bank Outside Diameter (ft) |
|--------------------------------|-----------------------------------|---|---|---|---------------------------------|---|--|-------------------------------------|
| 8 | 4 | 0.3491 | 0.0873 | 104.7 | 195,878 | 170,936 | 5.43 | 493.2 |
| 8.5 | 4.5 | 0.3941 | 0.1104 | 111.3 | 184,356 | 181,620 | 4.56 | 506.8 |
| 9 | 5 | 0.4418 | 0.1364 | 117.8 | 174,114 | 192,303 | 3.91 | 520.0 |
| 9.5 | 5.5 | 0.4922 | 0.1650 | 124.4 | 164,950 | 202,987 | 3.41 | 533.0 |
| 10 | 6 | 0.5454 | 0.1964 | 130.9 | 156,702 | 213,670 | 3.02 | 545.6 |
| 10.5 | 6.5 | 0.6013 | 0.2304 | 137.4 | 149,240 | 224,354 | 2.70 | 557.9 |
| 11 | 7 | 0.6600 | 0.2673 | 144.0 | 142,457 | 235,037 | 2.44 | 570.0 |
| 11.5 | 7.5 | 0.7213 | 0.3068 | 150.5 | 136,263 | 245,721 | 2.22 | 581.8 |
| 12 | 8 | 0.7854 | 0.3491 | 157.1 | 130,585 | 256,404 | 2.04 | 593.3 |
| 12.5 | 8.5 | 0.8522 | 0.3941 | 163.6 | 125,362 | 267,088 | 1.88 | 604.7 |
| 13 | 9 | 0.9218 | 0.4418 | 170.2 | 120,540 | 277,771 | 1.74 | 615.8 |
| 13.5 | 9.5 | 0.9940 | 0.4922 | 176.7 | 116,076 | 288,455 | 1.62 | 626.8 |
| 14 | 10 | 1.0690 | 0.5454 | 183.3 | 111,930 | 299,138 | 1.52 | 637.6 |
| 14.5 | 10.5 | 1.1467 | 0.6013 | 189.8 | 108,071 | 309,822 | 1.43 | 648.1 |
| 15 | 11 | 1.2272 | 0.6600 | 196.4 | 104,468 | 320,505 | 1.35 | 658.5 |
| 15.5 | 11.5 | 1.3104 | 0.7213 | 202.9 | 101,098 | 331,189 | 1.27 | 668.8 |
| 16 | 12 | 1.3963 | 0.7854 | 209.4 | 97,939 | 341,872 | 1.21 | 678.9 |



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