

*Elmosa Offshore Intake systems vs. v-wire screens*

**Table 2: Cost comparison between the InvisiHead and the Wedge-Wire Screen Intakes**

SN	Parameter	InvisiHead	Wedge-wire screen intake
1	Costs per installed cubic meter per hour	\$270 for smaller systems to \$66 for larger ones	\$1112 for smaller systems to \$198 for larger ones
2	Total cost: Capital + O&M	A 4.4m InvisiHead to supply 1.73 m <sup>3</sup> /s and costs \$200,000 – No O&M costs are associated. The IH is O&M-free	A wedge wire screen to provide same quantity and quality of water would cost \$551,000 plus and annual O&M costs of \$68,000*
3	Costs per a cubic meter produced	2.73 billion m3 per the 50 year structure useful life costing \$0.00012/m3	In 20 yrs.-the expected useful life- the screens will supply <90 million m3 costing \$0.043/m <sup>3</sup>
4	O&M costs or cost saving over the useful life	It saves \$68,000 per year. It pays back its capital in 35 months after commissioning and saves over 3 million over its operating life	\$68,000 per year will be spent on O&M or in 20 years a total of \$1,360,000 will go for O&M
5	Costs of the seawater intake pumps installed in the onshore intake basin	To cover costs of pumps required to pump 100% of the plant capacity.	To cover pumps required to pump 100% of the plant capacity plus backwash and flushing water quantities.
6	Costs to cover backwash screen air compressors	No costs are involved since no backwash is required.	Added since back wash is an integral part of the system.
7	basin screen backwash blowers	No costs are involved since no basin screen backwash is required.	Added since back wash is an integral part of the system
8	Costs to cover offshore screen backwash burst air compressors	No costs involved since no offshore screen backwash is required.	Added since back wash is an integral part of the system.
9	Air compressors, air purging	No costs are involved since no air purging is required.	Added since air purging is an integral part of the system.
10	Backwash equalizing basin blowers	No costs are involved since no screens are required.	Added since screening is an integral part of the system
11	Offshore screen	No costs are involved since no offshore screens are required.	Added since screening is an integral part of the system.
12	Trash racks	No costs are involved since no screening is required.	Added since screening is an integral part of the system.
13	Control systems, sensors and alarms	No costs are involved since no screening is required.	Added since screening is an integral part of the system.
14	Costs of the complete Elmosa offshore seawater intake system	They include the costs of the offshore portion (the passive InvisiHead) the pipeline, the passive onshore intake basin, and the seawater pumps. The pipeline costs are less due to the smaller pipes required for the operation. The costs of the intake basin are less due to its smaller size. The costs of seawater pumps are less due to the lesser capacity required for system operation.	The costs of the wedge wire screen intake system include the costs of the active wedge wire screen intake head, the pipelines, and the screening and filtration equipment installed in the onshore intake basin. Extra costs are required for a larger pipeline, a large intake basin, and backwash, flushing, and air purging equipment including compressors, air supply pipes, and pumps, and computer monitoring systems to operate the backwash and cleanup systems when pressure drop threshold is reached.
15	Energy costs	The only costs involved are those involved with the seawater intake pump operation	Higher costs are involved in the operation of the seawater intake pumps, backwash and flushing pumps, blowers, compressors, etc.

**Table 3: Capital Costs vs. Capacity**

Capacity m <sup>3</sup> /s (1,000gpm)*	1.26(20)	2.5(40)	3.8(60)	5(80)	6.3(100)	7.6(120)	8.8(140)	10(160)
InvisiHead, \$1,000	284	441,000	730	897	1,186	1,512,	1,626	1,873
Wedge Wire Screens, \$1,000	1,200	2,000	3,000	3,800	4,750	5,800	6,800	7,600

**Table 4: Total Annual O&M Costs vs. Capacity**

Capacity, 1,000 gpm*	20	40	60	80	100	120	140	160
InvisiHead, \$	0	0	0	0	0	0	0	0
Wedge Wire Screens, \$	50,000	54,000	61,000	66,000	65,000	68,000	70,000	71,000

\*US EPA § 316(b) Phase II Final Rule – TDD - Chapter 1: Technology Cost Modules



**Elmosa Seawater Intake and Outfall Systems**

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