CLAIMS

1. Method for producing freshwater through a reverse osmosis process in a submerged membrane system requiring a differential pressure over the membrane system, comprising at least one submerged, reverse osmosis unit (1), with an inlet (4) for water and an outlet (7) for fresh water, a riser device (2) extending from the outlet (7) of the submerged membrane system to at, above or below sea level and a system for providing a low pressure side for the reverse osmosis process,

c h a ra c t e ri z e d i n that the differential pressure is provided by introducing gas bubbles in the riser device (2) downstream the outlet (7) for fresh water in the riser device (2),

wherein introducing the gas bubbles is by electrolysis of water which is by means of at least two electrodes (13), closely spaced apart, wherein one of the at least two electrodes (13) used can be the riser device (2), and wherein the electrodes (13) are induced with electrical current in connection with an electrical power supply (12) for producing oxyhydrogen rich gas from the water inside the riser device (2), generating bubbles ascending in an upwards flow, reducing the weight of a water column in the riser device (2) and thereby reducing the pressure at the outlet (7) and also lifting produced water to a top end of the riser (2).

2. Method according to claim 1, by arranging the riser device (2) in a vertical position or at least in upwards inclined position.

3. Method according to claim 1 or 2, by introducing the gas bubbles as a flow of compressed gas supplied from the sea level through a supply line.

~~4. Method according to claim 1 or 2, by introducing the gas bubbles by electrolysis of water.~~

~~5. Method according to claim 4, by introducing the gas bubbles by means of at least two electrodes (13), closely spaced apart, where one of the at least two electrodes (13) used can be the riser device (2), and where the electrodes (13) are induced with electrical current in connection with an electrical power supply (12) for producing oxyhydrogen rich gas from the water inside the riser device (2), generating bubbles ascending in an upwards flow, reducing the weight of the water column in the riser (2) and thereby reducing the pressure at the outlet (7) and also lifting produced water to the top end of the riser (2).~~

~~6~~4. Method according to claim ~~5~~ 1 where~~in~~ the electrical power supply (12) applies a pulsed electrical signal to ignite an arc across the electrodes (13) in order to produce oxyhydrogen rich gas.

~~7~~5. Method according to any of the claims ~~3 -6~~ 1 to 3, wherein the gas bubbles, which are bubbles of gas~~,~~ and vapour ~~and other substances~~, together with the purified water are ascended to extraction in a tank or a separator (9, 14) above sea level, at sea level or at a subsurface level for use in different applications.

~~8~~6. Method according to any of the claims ~~3-6~~ 1 to 3, wherein the purified water is distributed to consumer and gases are distributed to further processing, recycling, and storage or to ~~the environments~~an environment when released from produced purified water when entering a tank or a separator above sea level, at sea level or at a subsurface level.

~~9~~7. Method according to claim 3, wherein compressed gas supplied from the sea level enters the riser device (2) with an amount giving a differential pressure across the reverse osmosis unit (1), equal or higher than the required pressure to overcome osmotic pressure.

~~10~~8. Method according to claim ~~5~~1, by inducing the electrical current at a level where~~in~~ the generated bubbles decreases the pressure in the riser device (2) downstream from point of bubble generating, giving a pressure difference across the reverse osmosis unit equal or higher than the required pressure to overcome osmotic pressure.

~~11~~9. Method according to any one of claim ~~2-6~~ 1 to 3, wherein a by-product of the reverse osmosis process, which may be brine or other contaminated water, is transported away from the submerged, reverse osmosis unit (1) by use of an upright second riser device (3) extending from the brine outlet where gas bubbles are introduced in the second riser device (3) in order to provide an upward flow.

~~12~~10. Method according to claim 1 , wherein the riser device (2) is extending at, above or below sea level at an elevation high enough for utilization of gravitation/difference in altitude in order to transport purified water to shore or a tanker or the like.

~~13~~11. A system for providing differential pressure for a reverse osmosis process producing freshwater in a submerged membrane system comprising at least one submerged, reverse osmosis unit (1) with an inlet (4) for water and an outlet (7) for fresh water, a riser device (2) extending from the outlet (7) of the submerged membrane

system to at, above or below sea level and a system for providing a low pressure side for the reverse osmosis process,

c h a ra c t e ri z e d i n that the system for providing the low pressure side comprises an arrangement for introducing gas bubbles into ~~a~~ the riser device (2) downstream the outlet (7) for freshwater from a reverse osmosis unit (1).

wherein the arrangement for introducing gas bubbles into the riser device (2) is either of a nozzle (6) for introducing a flow of compressed gas supplied from the surface into the riser device (2), an arrangement of at least two electrodes (13), closely spaced, wherein one of the at least two electrodes (13) used can be the riser device (2), in connection with an electrical power supply (12) for producing oxyhydrogen rich gas or an arrangement for electrolysis.

~~14~~12. System according to claim ~~13~~11, wherein the riser device is in fluid communication with a separator (9, 14) at, above or below sea level separating gas and freshwater arrived from the riser device (2).

~~15. System according to claim 13 or 14, wherein the arrangement for introducing gas bubbles into the riser device (2) is either of a nozzle (6) for introducing a flow of compressed gas supplied from the surface into the riser device (2), an arrangement of at least two electrodes (13), closely spaced, where one of the at least two electrodes (13) used can be the riser device (2), in connection with an electrical power supply (12) for producing oxyhydrogen rich gas or an arrangement for electrolysis.~~

~~16~~13. System according to one of the claims ~~13-15~~ 11 and 12, where in the arrangement for introducing gas bubbles into the riser device (2) may be arranged in at least two levels in the riser device (2) dispersed from downstream the outlet (7) of the submerged membrane system towards the sea level, and ~~where~~ the bubbles ~~may be~~are introduced at selected levels in the riser device (2) being introduced simultaneously at the at least two levels, or being introduced stepwise, starting from the level closes to the sea level, and subsequently introducing the bubbles level by level or at selected levels towards the outlet (7) of the submerged membrane system.

~~17~~14. System according to claim ~~16~~13, where in the bubbles being introduced ~~may~~ continue being produced at the selected levels in the riser device (2) and/or where in each of the at least two levels in the riser device (2) can be activated or deactivated for controlling the production of freshwater.