What is claimed is:

CLAIMS

1. A power generation plant, comprising a salinity gradient power unit with a high salinity feed, a low salinity feed, and a mixed water output; said high salinity feed comprising rehydrated high salinity output from a zero liquid discharge desalination plant; said mixed water output is directed into a body of water.

2. The power generation plant of claim 1, wherein the salinity of the mixed water output does not exceed the salinity of the body of water by more than 3%.

3. The power generation plant of claim 1, wherein the salinity and density of the mixed water output is less than the salinity and density of the body of water.

4. The power generation plant of claim 1, wherein the low salinity feed is comprised of secondary effluent from a wastewater treatment plant.

5. The power generation plant of claim 1, wherein the low salinity feed is comprised of river water from an estuary.

6. The power generation plant of claim 1, wherein secondary effluent from a wastewater treatment plant is used to rehydrate the high salinity output.

7. The power generation plant of claim 1, wherein river water from an estuary is used to rehydrate the high salinity output.

8. The power generation plant of claim 1, wherein seawater is used to rehydrate the high salinity output.

9. The power generation plant of claim 1, wherein the concentrate stream from a desalination plant is used to rehydrate the high salinity output.

10. The power generation plant of claim 1, wherein said salinity gradient power unit further comprises a reverse electrodialysis unit.

11. The power generation plant of claim 1, wherein said salinity gradient power unit further comprises a pressure-retarded osmosis unit.

12. The power generation plant of claim 1, wherein said mixed water output is combined with said low salinity feed before entering said body of water.

13. A method of producing power comprising the steps of:

providing a salinity gradient power unit;

providing dehydrated high salinity output from a zero liquid discharge desalination plant;

providing secondary effluent from a waste water treatment plant;

rehydrating said dehydrated high salinity output;

feeding said salinity gradient power unit with said rehydrated high salinity output as a high salinity feed;

feeding said salinity gradient power unit with said secondary effluent from a waste water treatment plant as a low salinity feed;

generating an electrical current in said salinity gradient power unit;

producing a mixed water output that is directed into a body of water, the salinity of said mixed water output does not exceed the salinity of said body of water by more than 3%.

14. The method of claim 13, wherein the temperatures of said high salinity and low salinity feeds are increased.

15. The method of claim 13, wherein the salinity and density of said mixed water output is less than the salinity and density of said body of water.

16. The power generation plant of claim 13, wherein said gradient power unit comprises a reverse electrodialysis unit.

17. The power generation plant of claim 13, wherein said gradient power unit comprises a pressure-retarded osmosis unit.

18. A method of zero liquid discharge disposal comprising the steps of:

providing dehydrated high salinity output from a zero liquid discharge desalination plant;

providing a low salinity feed;

rehydrating said dehydrated high salinity output;

producing a mixed water output comprising said low salinity feed and rehydrated high salinity output; and

directing said mixed water output into a body of water, the salinity of said mixed water output does not exceed the salinity of said body of water by more than 3%.

19. The method of claim 16, wherein said low salinity feed is comprised of river water.

20. The method of claim 16, wherein said low salinity feed is comprised of secondary effluent from a wastewater treatment plant.

CLAIMS

What is claimed is:

1. A method of generating power comprising:
i) providing dehydrated high salinity output (DHSO) from a zero liquid discharge (ZLD) desalination plant and rehydrating said DHSO to form a rehydrated high salinity feedwater (RHSF) having a salinity content of between about 150,000-300,000 ppm;

ii) providing a low salinity feedwater comprising effluent from a wastewater treatment plant said low salinity feedwater having a salinity content of about 500-2,000 ppm;

iii) feeding said RHSF from i) to a salinity gradient power unit (SGPU) as a high salinity feed to said SGPU;

iv) feeding said low salinity feedwater from ii) to a SGPU as a low salinity feed to said SGPU;

v) generating electrical power in said SGPU;

vi) producing a mixed water output from said SGPU; and

vii) discharging said mixed water output into a body of water whereby the salinity of said mixed water output does not exceed the salinity of said body of water by more than 3%.

2. The method as recited in claim 1 wherein said low salinity feedwater from ii) is used to rehydrate said DHSO.

3. The method as recited in claim 1 wherein said SGPU is a reverse electrodialysis unit.

4. The method as recited in claim 1 wherein said SGPU is a pressure-retarded osmosis unit.

5. The method as recited in claim 1 wherein said mixed water output is mixed with said low salinity feedwater before being discharged into said body of water.