















# UPDATE ON THE EL PASO FULL RECOVERY DESALINATION PLANT March 2017

# Introduction to EWM



- Enviro Water Minerals Company (EWM) has created a revolutionary desalination solution that extracts the dissolved solids contained in a variety of salty water sources for beneficial use:
  - Waste brine contains marketable minerals, which EWM extracts to sell
  - Full resource recovery (no residual waste water)
- Coupling of revenue from mineral sales and sale of potable water makes business model feasible
- Intellectual Property Patent portfolio of 12 process patents

### REINVENTING DESALINATION



### **Example Sources**

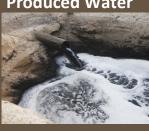
#### **Brackish Water**



Seawater



**Produced Water** 



# **Full Recovery Desalination**



- ✓ All contaminants separated into mineral products (zero discharge)
- ✓ Water yield = ~99%
- ✓ Is often cheapest new water supply option available

### **Example Production**

**Potable Water** 



**Agricultural Gypsum** 





**Bromide Rich Brine** 



**Caustic Solution** 



**Potash Liquid Fertilizer** 



**High-Purity Salt** 

























# FIRST SITE: EL PASO



EWM's first project in El Paso will commence commercial operations in Spring 2017

### Benefits to El Paso include:

- Enhanced yield from existing desalinization plant (<u>effectively</u> <u>99%)</u>
- Avoided concentrate disposal issues
- Preservation of brackish water aquifer life



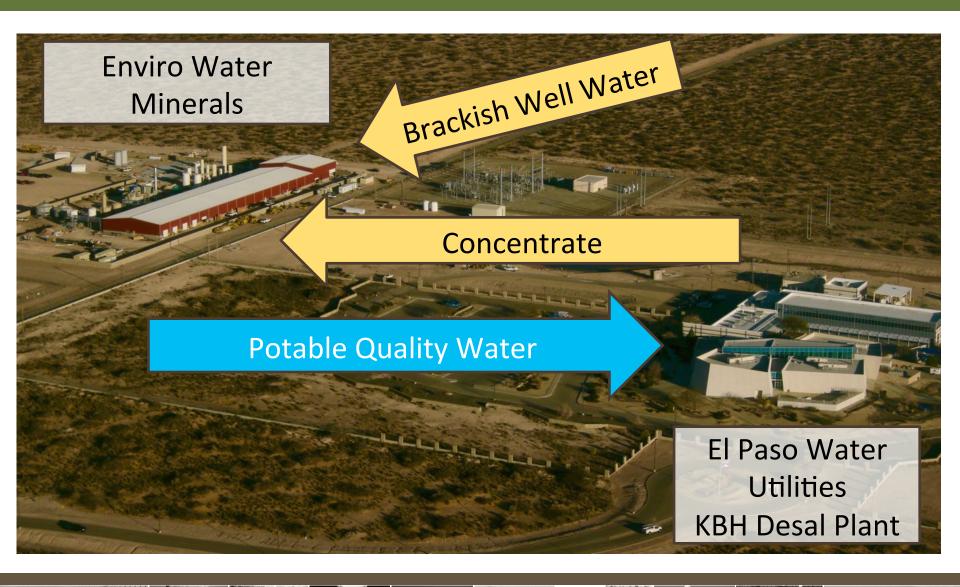






# **EWM** AND **EPWU**







### **EWM El Paso Plant**



Calcium Chloride Brine To Mineral Production

#### **EXISTING EPWU KAY BAILEY HUTCHISON DESALINATION PLANT BWRO** Desalination Disinfection, Blending and Distribution **Brackish Wells** Potable Water to El Paso 85% recovery 99% well water recovery with full brine flow to EWM Chlorine Potable Water 14% recovery Waste Brine to BWRO Brine 12,000 mg/l dissolved salts **Disposal Wells** ENVIRO WATER MINERALS EL PASO PLANT Heater Softener Nano-Filtration Electrodialysis Degasifier Air+CO2 80% recovery **Desalinated Water** 125% flow 93% Recovery (Basis Brine Feed) 90% recovery Hot Water 700 mg/l dissolved salts 100 F HCl Caustic Air Soft Dilute Acid\* from Sulfate and Sodium Chloride Brine Low Hardness Mineral Production **Bicarbonate** To Mineral Production Sulfate Free Free Brine Brine Calcium Sulfate Brine Magnesium Chloride, To Mineral Production



\* NSF 60 certified acid provides additional product water and silica desaturation

# **EWM PRODUCTION**



- Produce ~2.1 mgd potable-quality water from 1 mgd of raw brackish water + 1.25 mgd concentrate
  - Influent raw brackish water TDS: 2,500 mg/L
  - Influent concentrate TDS: 13,000 mg/L

### ■ Products:

- Potable-Quality Water (TDS<700 mg/L)</li>
- Caustic Soda (50% Concentration)
- Hydrochloric Acid (35% Concentration)
- Gypsum (high purity, 100% Soluble)
- Magnesium Hydroxide (98% Purity, 56% Solid)

# CONSTRUCTION UPDATE



- Broke Ground January 2016
- Commence commercial operations: Spring 2017



















# SITE PICS: NANO FILTRATION / RO







# SITE PICS: SETTLING





















# SITE PICS: ELECTRODIALYSIS







# **SITE PICS: ION EXCHANGE**





















# **OUTSIDE EQUIPMENT**



6.5 MW Natural Gas CHP



<u>Degassifier</u>

**Cooling Towers** 



**Evaporator** 



### **DESALINATION REINVENTED**



EWM's Full Recovery Desalination makes beneficial use of contaminants, eliminating costly and environmentally hazardous disposal issue

- All contaminants are separated into mineral products (zero liquid discharge)
- Water yield = ~99%
- Preserves finite aquifer resources
- Avoids disposal issues
- Often is cheapest new water supply option available
- Low CO2 footprint
- 12 Patents / patents pending



Winner of the Texas
Water Development
Board's 2017 Innovative
Water Supply Award for
the Technology Category