Produced Water Project
San Juan Generating Station
ZeroNet Perspective
PNM Water Issues in the San Juan Basin…..

- San Juan Generating Station (SJGS) consumes 22,000 acre-feet of water per year (467,600 BPD or 13,640 gpm).
- SJGS needs a reliable source(s) of water to operate.
- There are continuing political pressures to use less water in New Mexico.
- SJGS is a long-term energy production site – it will be there 25 years from today.
- PNM has negotiated short-term and long-term water contracts to ensure supply.
- Endangered species in the San Juan River will reduce the reliability of water supply.
- If SJGS uses less water through conservation and obtains alternative supplies (e.g. produced water), more water will be available for others in the San Juan Basin.
Project Benefits.....

- Conserve river water for other beneficial uses in New Mexico.
- Reduce the diversion of water from the San Juan River for cooling at San Juan Generating Station.
- Enable the San Juan Generating Station to be more drought resistant.
- Reduce the volume of produced water that must be handled and injected by producers.
- Reduce produced water handling and injection costs.
- Establish an infrastructure to minimize produced water injection in the San Juan Basin.
- Establish area-wide opportunities to reduce produced water handling and injection costs.
Total Produced Water = 61,775 BPD

Each circle represents a production well or well cluster.

Fruitland Petroleum System

Produced Water Project – Extent of Production
New Mexico Oil Conservation Division, 2002

San Juan River
San Juan County
Rio Arriba County
Navajo Reservoir
Produced Water Project – Phases 1 & 2
PNM – San Juan Generating Station

- **Produced Water**
- **Treatment System**
- **Collection & Pre-Treatment**
- **32-mile Pipeline**
- **Bloomfield Area Produced Water**
- **1,890 AF/yr**
- **1,170 gpm**
- **40,000 BPD**

**San Juan Generating Station**

- **Process Wastewater**
  - **1,450 AF/yr**
  - **900 gpm**
  - **30,850 BPD**

- **Treated Water to General Plant Use**
  - **3,760 AF/yr**
  - **2,330 gpm**
  - **79,740 BPD**

- **Waste Brine to Evap Ponds**
  - **195 AF/yr**
  - **120 gpm**
  - **4,110 BPD**

**Phase 1**

- **1,450 AF/yr**
- **900 gpm**
- **30,850 BPD**

**Phase 2**

- **2,505 AF/yr**
- **1,550 gpm**
- **53,000 BPD**

**Close-In CBM Produced Water (Kirtland Area)**

- **615 AF/yr**
- **380 gpm**
- **13,000 BPD**

**Waste Brine to Evap Ponds**

- **1,450 AF/yr**
- **900 gpm**
- **30,850 BPD**

**Produced Water/Project Scope/PRRC ZeroNet PW Presentation**
Produced Water Project – Component Schematic – Phase 1

PNM – San Juan Generating Station

Pipeline

Produced Water Treatment System

- Process Wastewater 800 gpm
- Treated Water to General Plant Use 1,120 gpm
- Reactor-Clarifier Sludge to Scrubbers 15 tpd
- Waste Brine to Evap Ponds 60 gpm

San Juan Generating Station

BHP

Praxair

Richardson

Dugan

Producers

PNM

11 miles

615 AF/yr
380 gpm
13,000 BPD

800 gpm
352 gpm
60 gpm
15 tpd
1,120 gpm
Produced Water Project – Component Schematic – Phase 2

PNM – San Juan Generating Station

Bloomfield Area
Produced Water

Burlington Resources
PNM

Reclaimed Oil (trucked)

Produced Water Collection & Pre-Treatment

Lift Station

Charge Pumps

To SJGS
1,890 AF/yr
1,170 gpm
40,000 BPD

21 miles

Off-Spec Water to Disposal (trucked)

1,890 AF/yr
1,170 gpm
40,000 BPD
Produced Water Project – Component Schematic – Phases 1 & 2

PNM – San Juan Generating Station

1. Process Wastewater
2. Treated Water to General Plant Use
3. Reactor-Clarifier Sludge to Scrubbers
4. Waste Brine to Evap Ponds

BHP
Praxair
Richardson
Dugan
Lift Station
Charge Pumps
PNM
Producers

11 miles
21 miles

Bloomfield Area Produced Water
Burlington Resources
PNM

Reclaimed Oil (trucked)

Off-Spec Water to Disposal (trucked)

Phase 2
Phase 1
McGrath SWD
Total Produced Water = 42,934 BPD
High Volume Townships = 34,963 BPD

Produced Water Daily Volume (BPD) – All Producers
High Volume Townships (highlighted blue)
New Mexico Oil Conservation Division, 2002
Produced Water Treatment
Process Schematics
Receiving Tank(s) API Oil-Water Separator Transfer Tank and Pump Holding Tank(s) Filter Feed Pump Cartridge Filter(s)

Produced Water Receiving Skimmed Oil

To Injection Well Pump

SWD Flow Schematic
SJGS Produced Water Reuse
Produced Water Pretreatment – Oil Removal – 01
San Juan Generating Station

Produced Water

Produced Water Receiving Tanks (2)

O/W Gravity Separators (2-100%)

Skimmed Oil

Skimmed Oil

EB Feeder

Walnut Shell Filter

Skimmed Oil

Tank

Rinse from Walnut Shell Filter

B/W from Walnut Shell Filter

40,000 BPD
Produced Water

Sludge

Rinse from Walnut Shell Filter

Skimmed Oil

Tank

Skimmed Oil Tank
HERO System – Process Schematic
San Juan Generating Station
Wet Surface Air Cooler

1. Air is induced downward over tube bundles
2. Water flows downward along with the air
3. Heat from the process stream is released to the cascading water
4. Heat is transferred from the cascading water to the air stream via vaporization
5. Air stream forced to turn 180° providing maximum free water removal
6. Fans discharge air vertically at a high velocity preventing recirculation