KICKING THE HABIT

ONE COMPANY'S EFFORT TO MINIMIZE FRESH WATER USE IN SE NEW MEXICO

Kent Adams
Vice President – Drilling and Completions
BOPCO, L.P.

Who is BOPCO?

- Private Exploration and Production Company HQ'd in Fort Worth, TX
- Active Operator in NM since early 1950's

Who is BOPCO?

- Private Exploration and Production Company HQ'd in Fort Worth, TX
- Active Operator in NM since early 1950's
- 5th Largest Oil Producer in NM in 2013

New Mexico Oil & Gas Association

2013 vs **2012** Gross **OIL** Production in New Mexico by Operator (Production in barrels of crude oil)

	2013 Production	12 Rank	12 Production	Increase (Decrease)
1 COG Operating, LLC	16,047,077	1	15,545,685	501,392
2 Oxy USA	7,975,671	2	6,717,718	1,257,953
3 Devon Energy	7,529,558	5	5,620,230	1,909,328
4 Apache Corp.	6,876,367	3	5,950,629	925,738
5 BOPCO, LP	6,310,148	7	4,235,850	2,074,298
6 Cimarex Energy	6,121,135	4	5,837,649	283,486
7 Chevron USA	5,785,461	6	4,969,260	816,201
8 ConocoPhillips	4,449,575	8	4,173,928	275,647
9 Mewbourne Oil Co.	4,317,727	10	3,023,035	1,294,692
10 Yates Petroleum Corp.	3,704,348	9	3,168,829	535,519

Who is BOPCO?

- Private Exploration and Production Company HQ'd in Fort Worth, TX
- Active Operator in NM since early 1950's
- 5th Largest Oil Producer in NM in 2013
- Exceptional YOY Growth Since 2009 Achieved Through Utilization of HZ Drilling and Hydraulic Fracturing.

New Mexico Oil Production by Operator

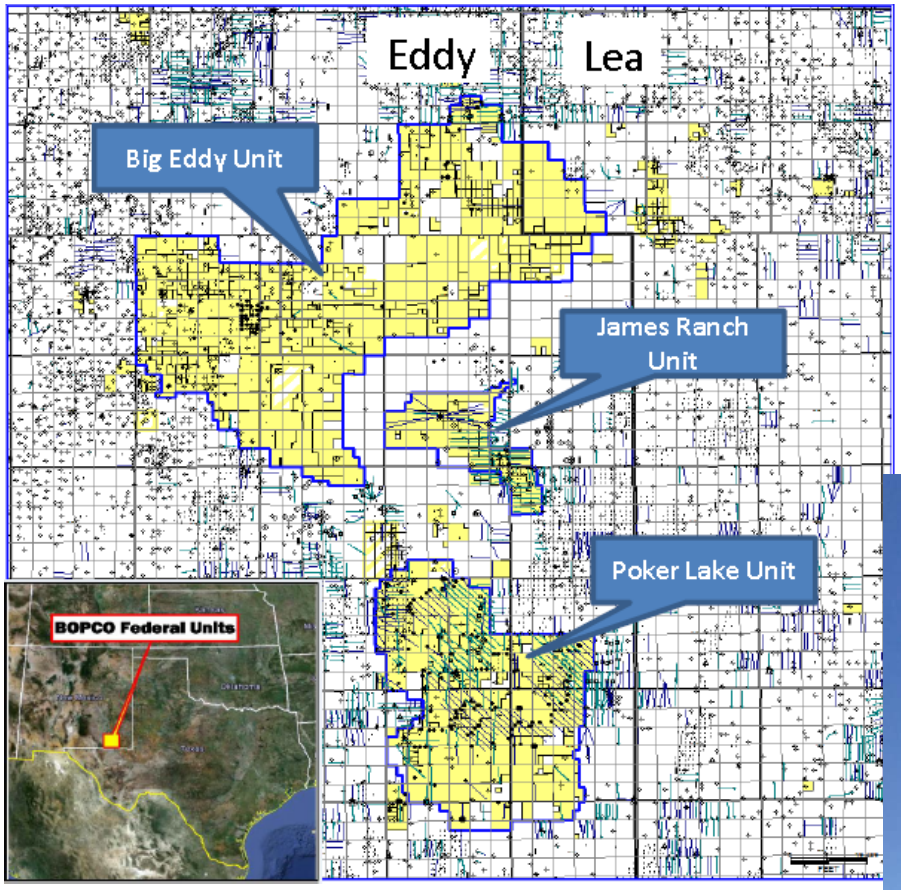
Rank	2009	2010	2011	2012	2013
1	Oxy	COG	COG	COG	COG
2	COG	Oxy	Oxy	Oxy	Oxy
3	Chevron	Chevron	Apache	Apache	Devon
4	ConocoPhillips	ConocoPhillips	Chevron	Cimarex	Apache
5	Apache	Apache	ConocoPhillips	Devon	***BOPCO***
6	Unknown	Cimarex	Cimarex	Chevron	Cimarex
7	Unknown	Devon	Devon	***BOPCO***	Chevron
8	Yates	XTO	***BOPCO***	ConocoPhillips	ConocoPhillips
9	XTO	Yates	Yates	Yates	Mewbourne
10	Devon	***BOPCO***	XTO	Mewbourne	Yates
11	Chesapeake	EOG	Mewbourne	EOG	EOG
12	Cimarex	Chesapeake	EOG	XTO	XTO
13	EOG	Mewbourne	Chesapeake	Burnett	Burnett
14	***BOPCO***	Burnett	DCP Midstream	Chesapeake	Legacy

New Mexico Oil & Gas Association

2013 vs **2012** Gross **OIL** Production in New Mexico by Operator (Production in barrels of crude oil)

		2013 Production	12 Rank	12 Production	Increase (Decrease)
1	COG Operating, LLC	16,047,077	1	15,545,685	501,392
2	Oxy USA	7,975,671	2	6,717,718	1,257,953
3	Devon Energy	7,529,558	5	5,620,230	1,909,328
4	Apache Corp.	6,876,367	3	5,950,629	925,738
5	BOPCO, LP	6,310,148	7	4,235,850	2,074,298
6	Cimarex Energy	6,121,135	4	5,837,649	283,486
7	Chevron USA	5,785,461	6	4,969,260	816,201
8	ConocoPhillips	4,449,575	8	4,173,928	275,647
9	Mewbourne Oil Co.	4,317,727	10	3,023,035	1,294,692
10	Yates Petroleum Corp.	3,704,348	9	3,168,829	535,519

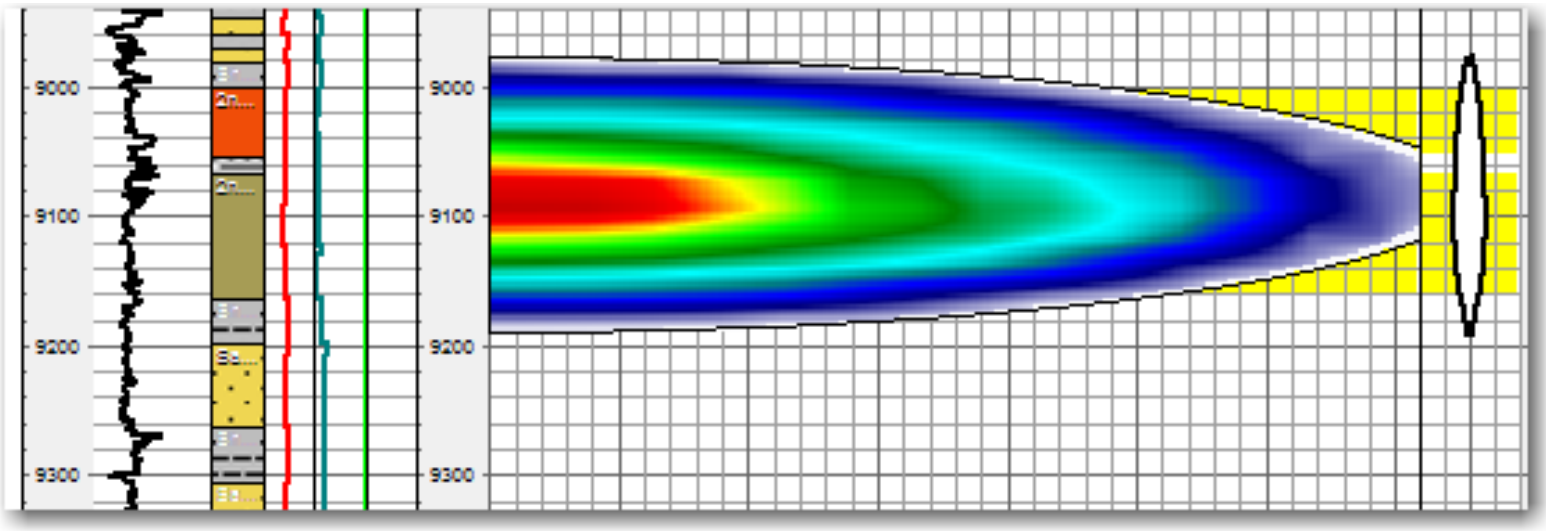
BOPCO New Mexico Acreage



- Three Large Units
- Mostly in Eddy County, NM
- Mostly Federal Acreage
- 200,000 Net Acres
- Contiguous

Historical Fresh Water Stimulation Design

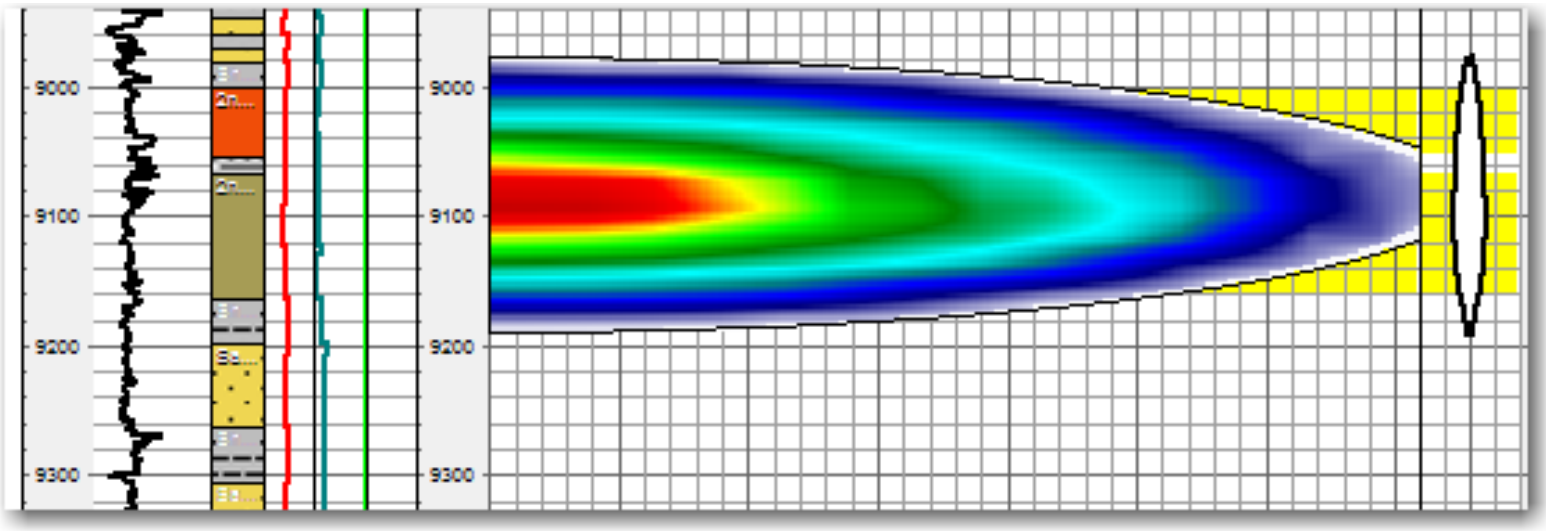
- Typically 50,000 to 100,000 bbls (2.1MM to 4.2 MM gal) used per well.
- Chemicals added to Gel and Crosslink the fluid.
- Proppant – 2 million to 5 million pounds of sand per well.



Historical Fresh Water Stimulation Design

•Typically 50,000 to 100,000 bbls (2.1MM to 4.2 MM gal) used per well.
•Chemicals added to Gel and Crosslink the fluid.
•Proppant – 2 million to 5 million pounds of sand per well.

<u>Advantages</u>
•Predictable – Chemistry to generate gelled fluid is well known
•Ease of Storage & Transport – Spilling fresh water is not an environmental problem.

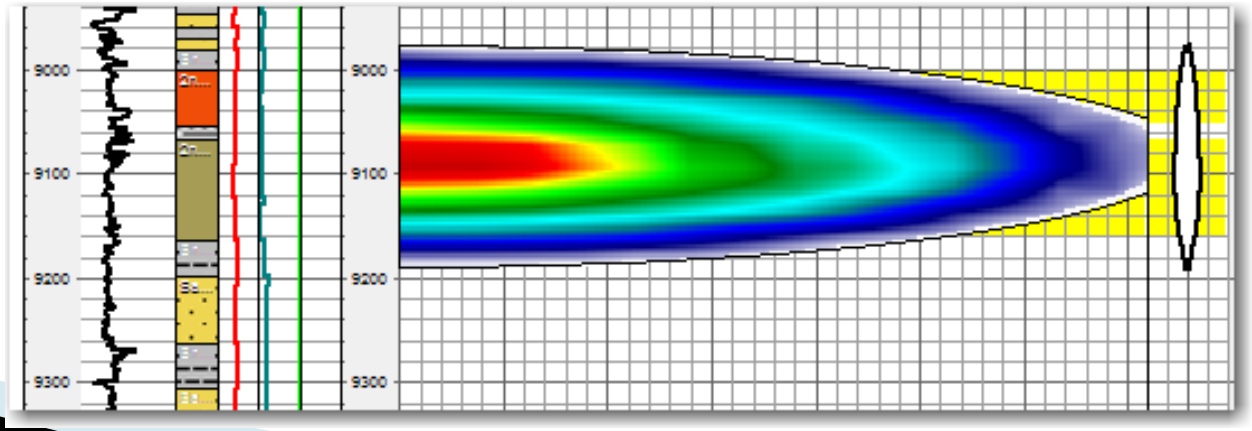


Historical Fresh Water Stimulation Design

•Typically 50,000 to 100,000 bbls (2.1MM to 4.2 MM gal) used per well.
•Chemicals added to Gel and Crosslink the fluid.
•Proppant – 2 million to 5 million pounds of sand per well.

Advantages
•Predictable – Chemistry to generate gelled fluid is well known
•Ease of Storage & Transport – Spilling fresh water is not an environmental problem.

Disadvantages
•SE New Mexico in Arid Desert Region.
•Cost/Competition for Use – Residential, Agriculture, Industrial (mining, O&G, etc)
•**Potentially Unreliable as a Long Term Source for a Stimulation Fluid**



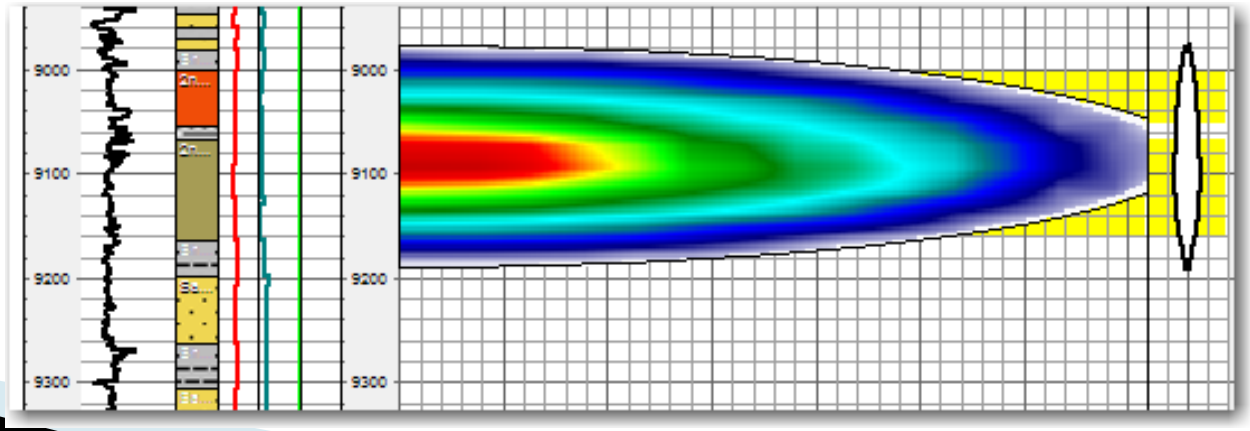
Historical Fresh Water Stimulation Design

•Typically 50,000 to 100,000 bbls (2.1MM to 4.2 MM gal) used per well.
•Chemicals added to Gel and Crosslink the fluid.
•Proppant – 2 million to 5 million pounds of sand per well.

Advantages
•Predictable – Chemistry to generate gelled fluid is well known
•Ease of Storage & Transport – Spilling fresh water is not an environmental problem.

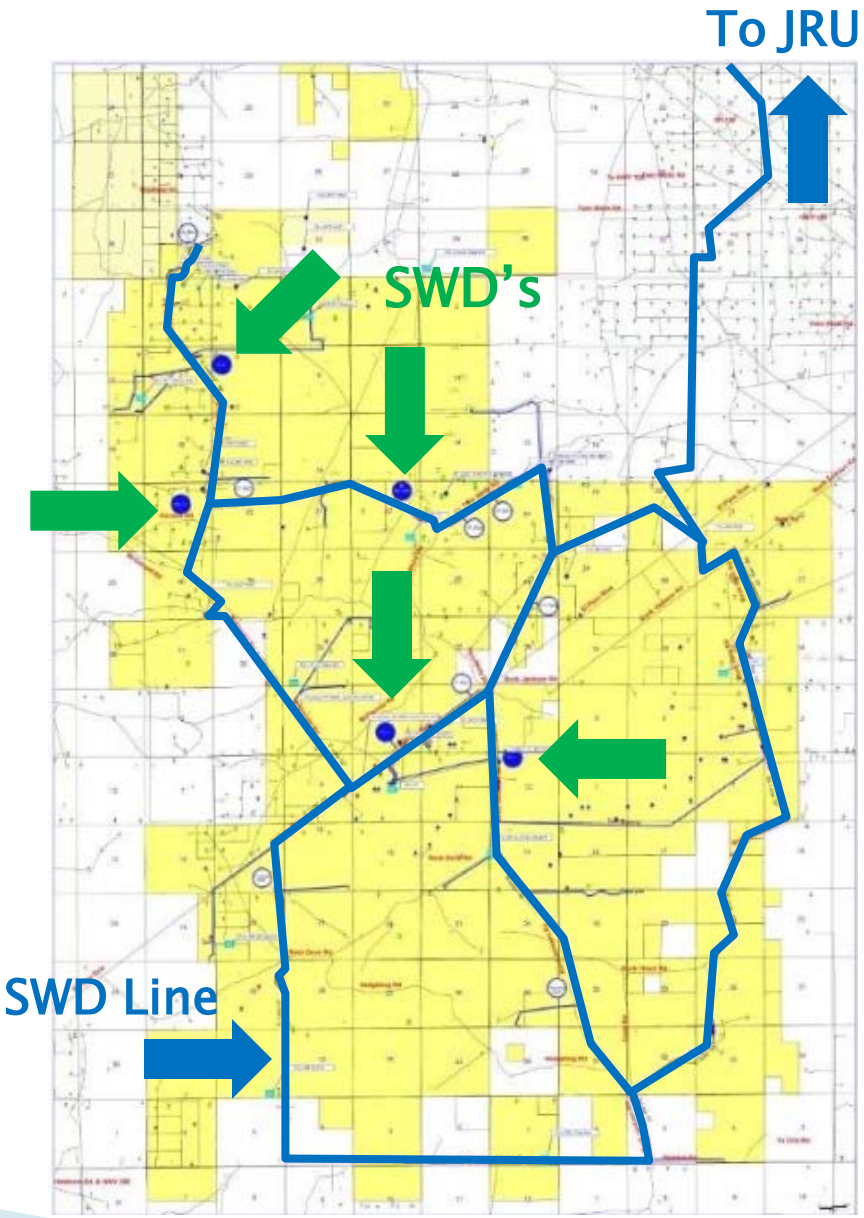
Disadvantages
•SE New Mexico in Arid Desert Region.
•Cost/Competition for Use – Residential, Agriculture, Industrial (mining, O&G, etc)
•**Potentially Unreliable as a Long Term Source for a Stimulation Fluid**

Alternative
•Produced Water – Plentiful, Natural By-Product of Oil & Gas Production
•Started Movement toward Utilizing Produced Water (PW) as a Stimulation Fluid in 2012



BOPCOs SWD Infrastructure

- Contiguous Acreage Ideal for Constructing and Utilizing Extensive Infrastructure
- Poker Lake Unit and James Ranch Unit Complete
- Approximatley 100,000 BWPD Available
- Work Ongoing in Big Eddy Unit

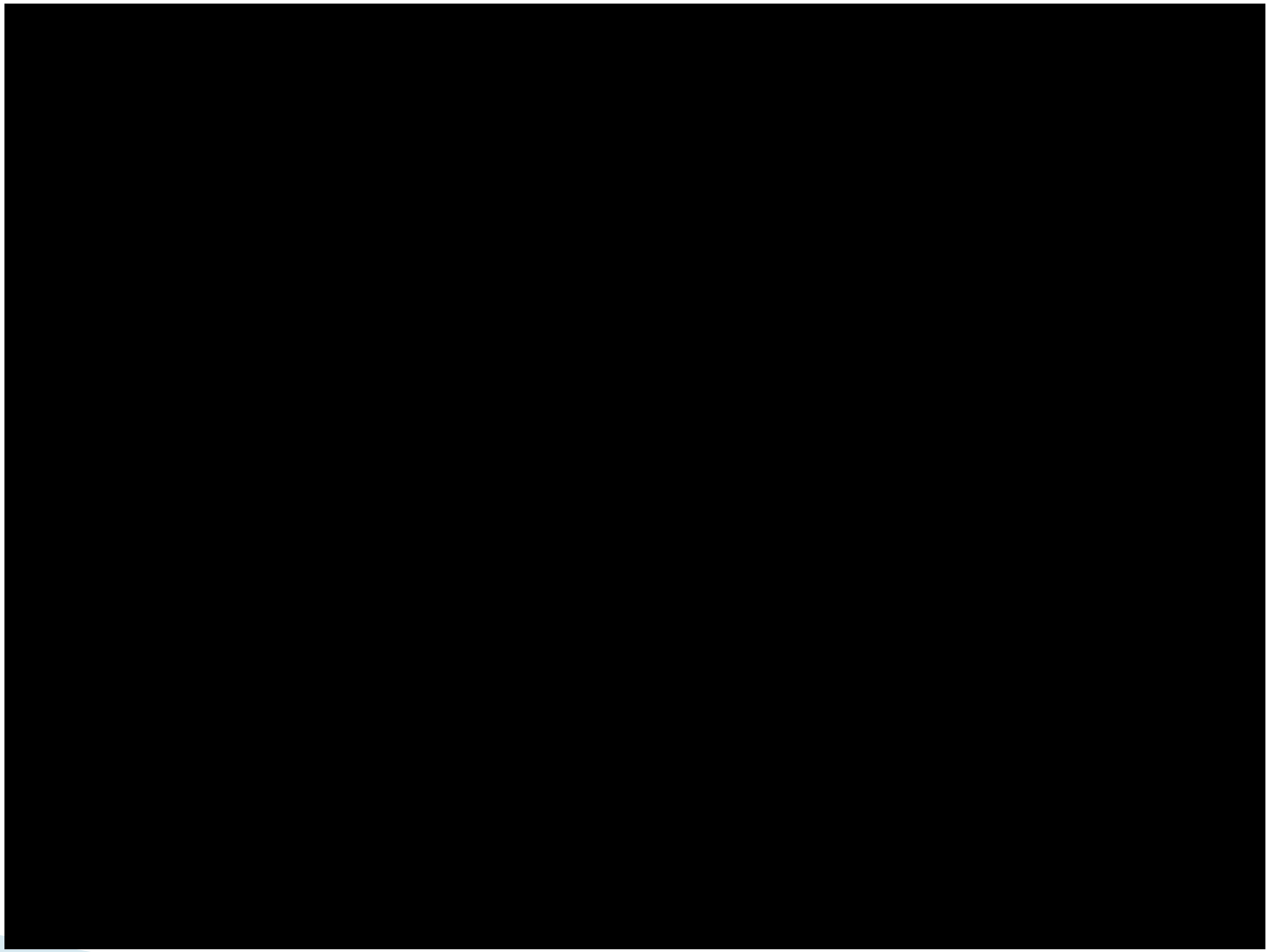


Challenges of Utilizing Produced Water

- Water is Highly Salt Saturated
- Consistency of PW in SWD System is Unpredictable
- Chemistry to Gel and Crosslink Produced Water is Immature
- Getting PW Where You Need it in the Quantities You Need is Logistically Difficult – Storage a Challenge
- Spilling PW on the Ground is Very Expensive to Clean Up

	Fresh Water	Produced Water
Specific Gravity	1.00	1.19
pH	7.9	5.9
Chlorides	640 ppm	174,000 ppm
Iron	0 ppm	550 ppm
Total Dissolved Solids	1320 ppm	265,000 ppm

Crosslinked Produced Water Example



Economics of Fresh Water vs Produced Water

* – Jobs Assume 15 Stages to Complete Standard 1 Mile Horizontal Well

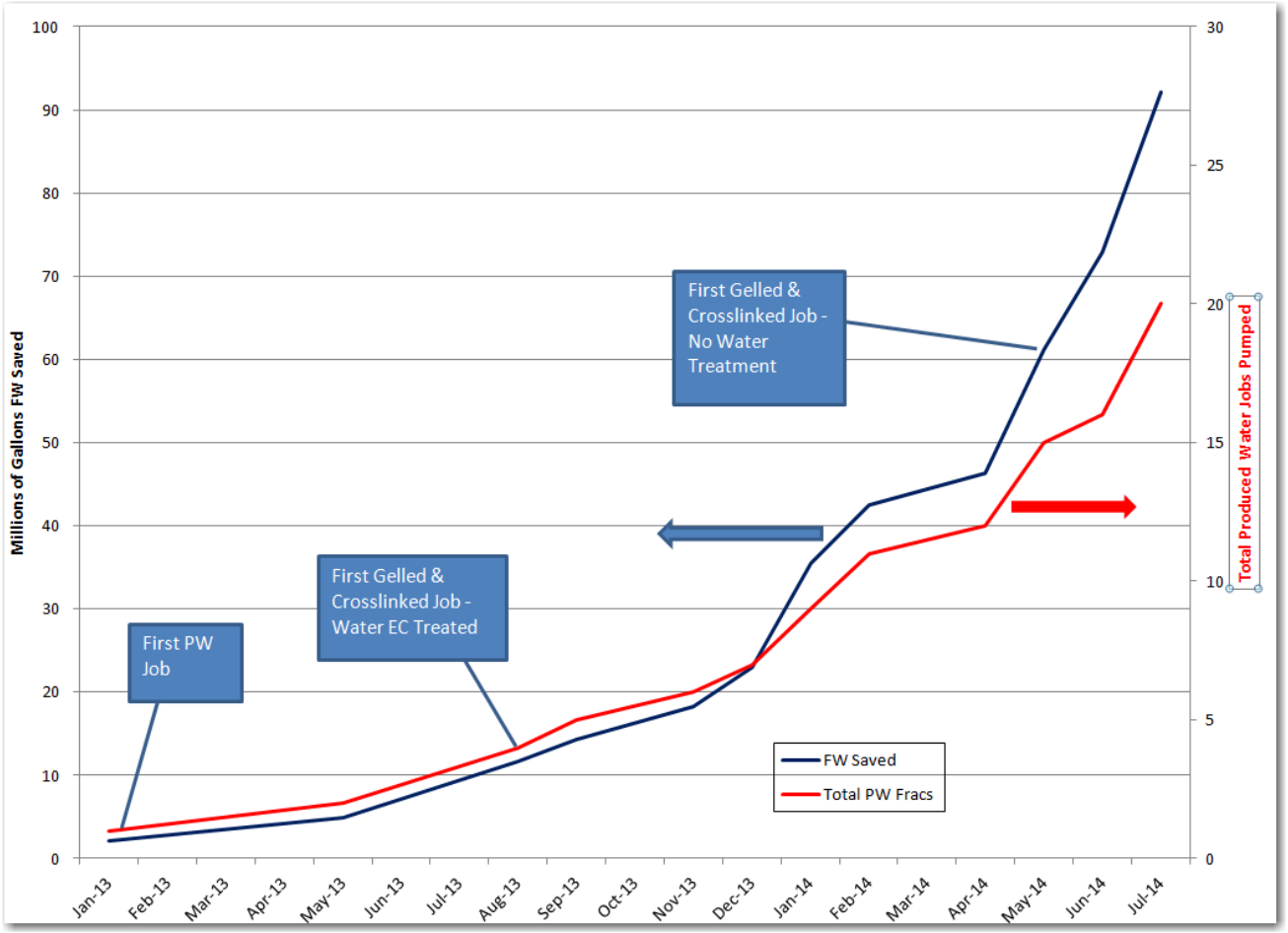
	FW Job	PW w/ EC	PW w/o Treatment
Water Cost	$250,000	$0	$0
Water Treatment	$0	$65,000	$22,500
Water Transport	$75,000	$285,000	$285,000
Pumping Cost	$1,300,000	$1,500,000	$1,500,000
Total Cost	$1,625,000	$1,850,000	$1,807,500

BOTTOM LINE

IT IS EXTREMELY CHALLENGING AND CURRENTLY COST NEUTRAL AT BEST TO UTILIZE PRODUCED WATER AS A STIMULATION FLUID.

BOPCO's Transition to Produced Water Stimulations

- **January 2013** – First PW Job Pumped in HZ Well
- **August 2013** – First Gelled & X-Linked PW Job Pumped – Water EC Treated to Remove Iron, TPH & TSS
- **May 2014** – First Gelled & XL Job Pumped with No Water Treatment
- **To Date** 20 Jobs Pumped Using 100% PW *Saving Approx 90 MM Gal of Fresh Water*
- **Currently** Utilize 100% Produced Water on ½ of BOPCO Acreage *Saving Approx 5 Million Gal Fresh Water per Job*



Continuing Optimization

- Logistics
  - Develop Infrastructure to Fully Utilize our Produced Water
  - Looking into Different Storage Options
  - Minimize Frac Tanks by Maximizing Delivery Rate
- Gel Chemistry – Fluid Stability
  - Water analysis
  - Breaker Tests
  - Chemical Usage
  - Temperature Evaluation
  - Scaling Tendency
- EH&S – Spill Prevention
  - Early detection of leaks
  - Use of containment alarms
  - Prompt Clean Up of Spills

KICKING THE HABIT

ONE COMPANIES EFFORT TO MINIMIZE FRESH WATER USE IN SE NEW MEXICO

QUESTIONS???