EPA Methane challenge Blowdown workshop

Steve Martz – Manager, Gas Planning

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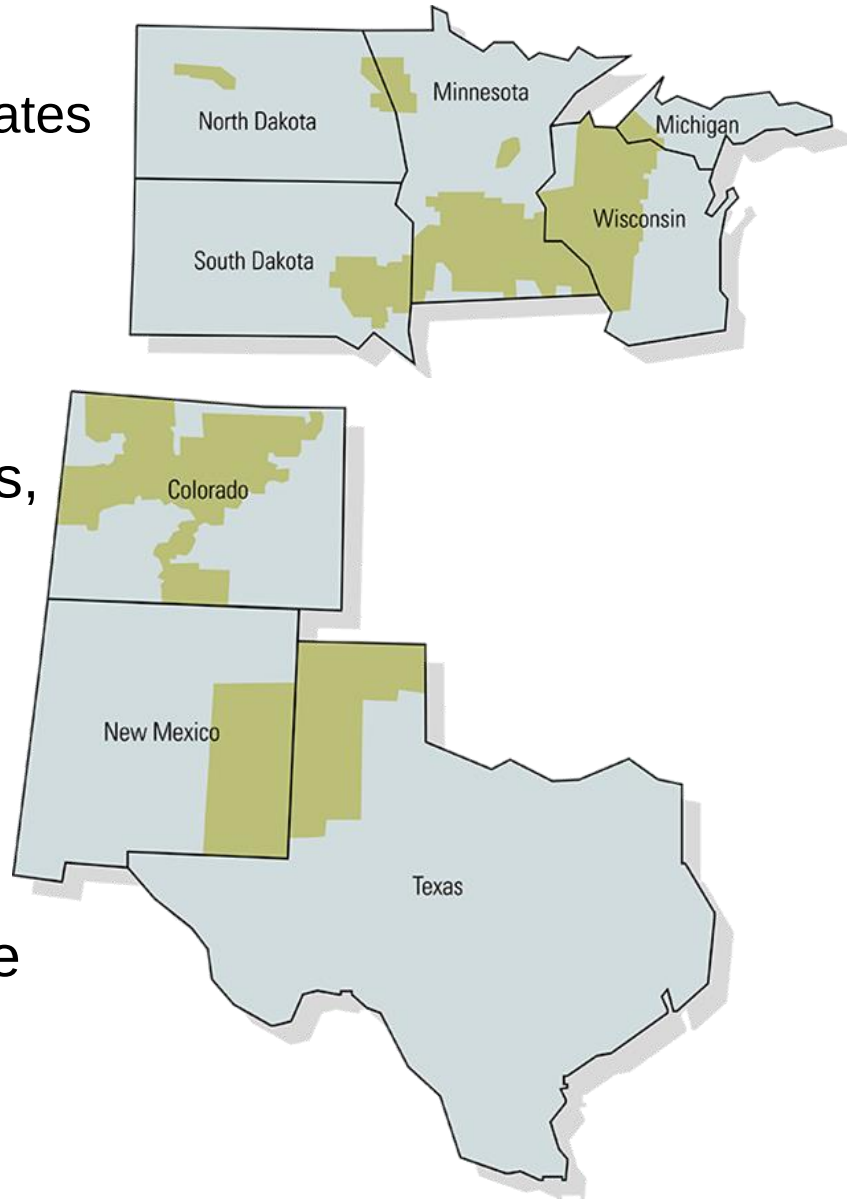
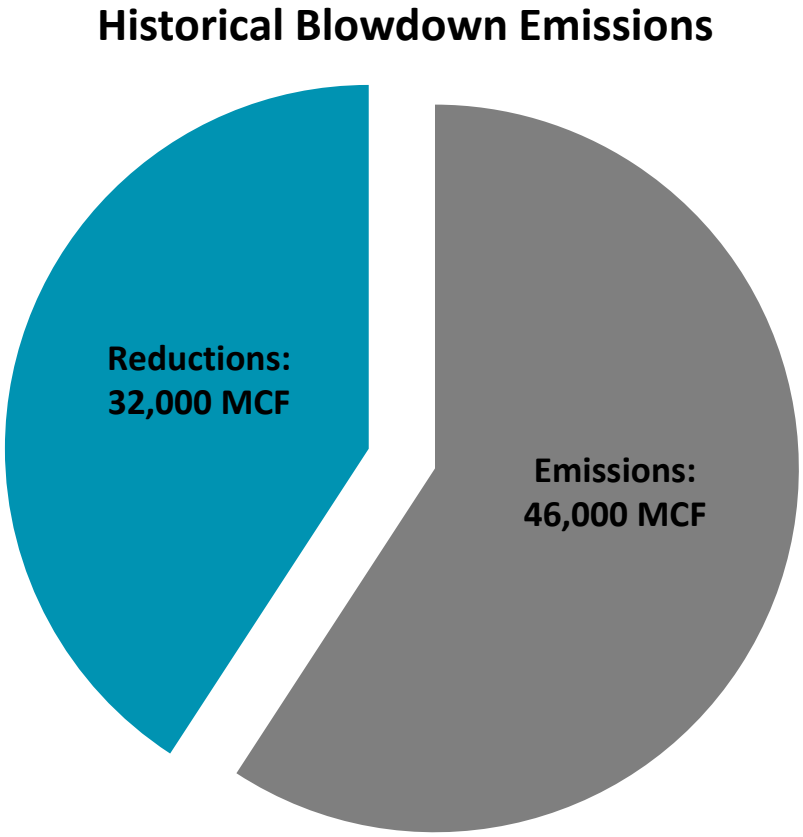
Xcel Energy – Overview

- Gas & Electric Utility operating across 8 states
  - Minnesota, Wisconsin, Michigan, Colorado, North/South Dakota, New Mexico, & Texas
- Gas service to over 2 million customers, mostly Minnesota & Colorado
- 2,200 miles of transmission main, 34,000 miles of distribution main
- Largest generator of wind energy in the US



BMP Commitment - Pipeline Blowdown

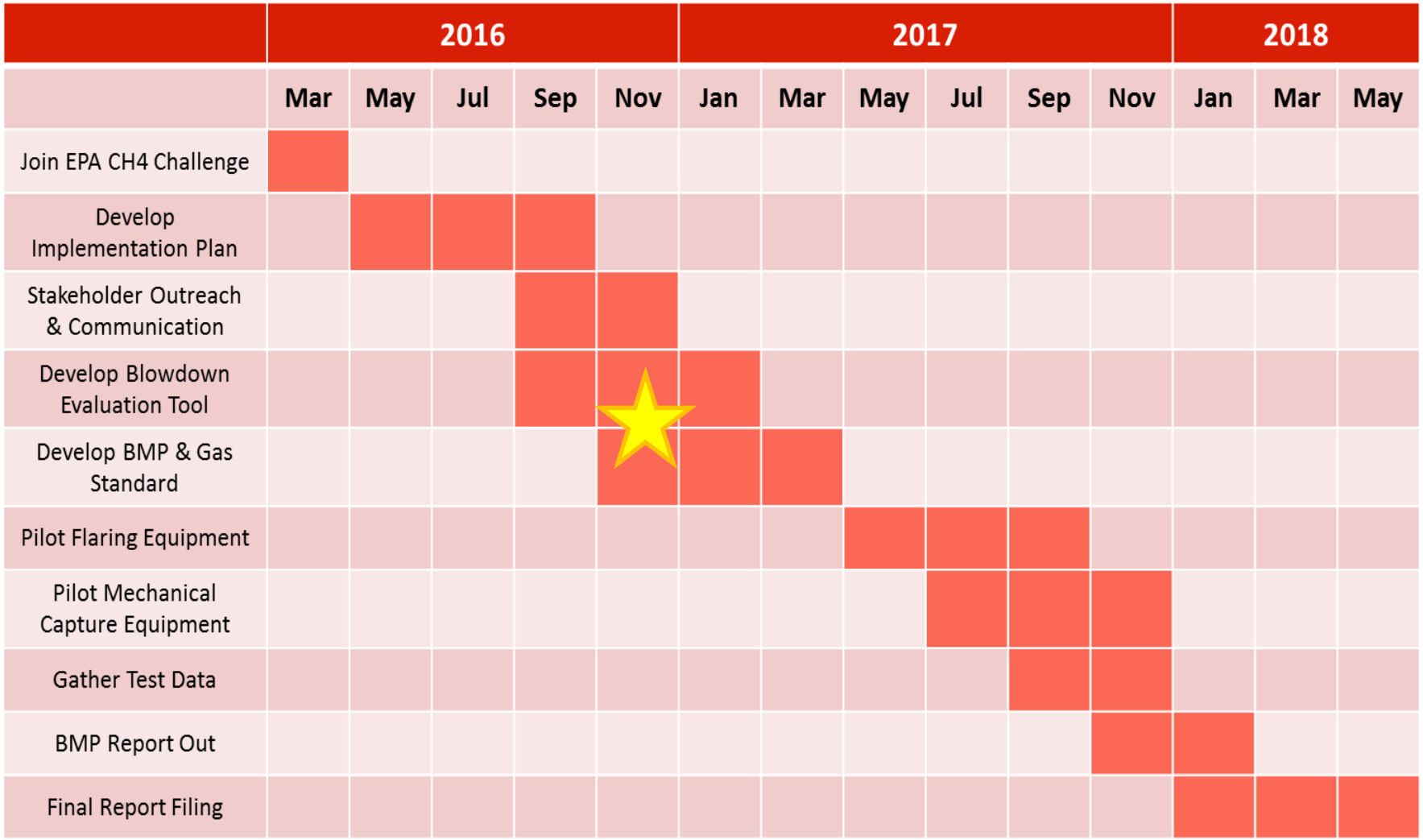
- **Blowdown BMP:**
  - Pipelines operating greater than 60 psig
  - Non-emergency pipeline blowdown events
- **Goal: Reduce total potential emissions by 50% each year**
- **Ability to leverage existing processes to track blowdown events**
- **Past reduction performance shows an annual average reduction of 41%**
  - Average 60 events per year
  - Use of pressure reduction and line-stop fittings
- **Minimal resources needed to achieve goal**



Historical Blowdown Performance

Year	# of Planned Events	Total Reduced Methane Emissions (MCF)	Total Methane Emissions Vented to Atmosphere (MCF)	Percent Reduced of Total Gas Volume
2010	50	6956	11982	37%
2011	70	7294	5669	56%
2012	129	2806	3708	43%
2013	19	2229	9944	18%
2014	17	8356	6414	57%
2015	14	4426	8696	34%
Total	299	32,067	46,413	41%

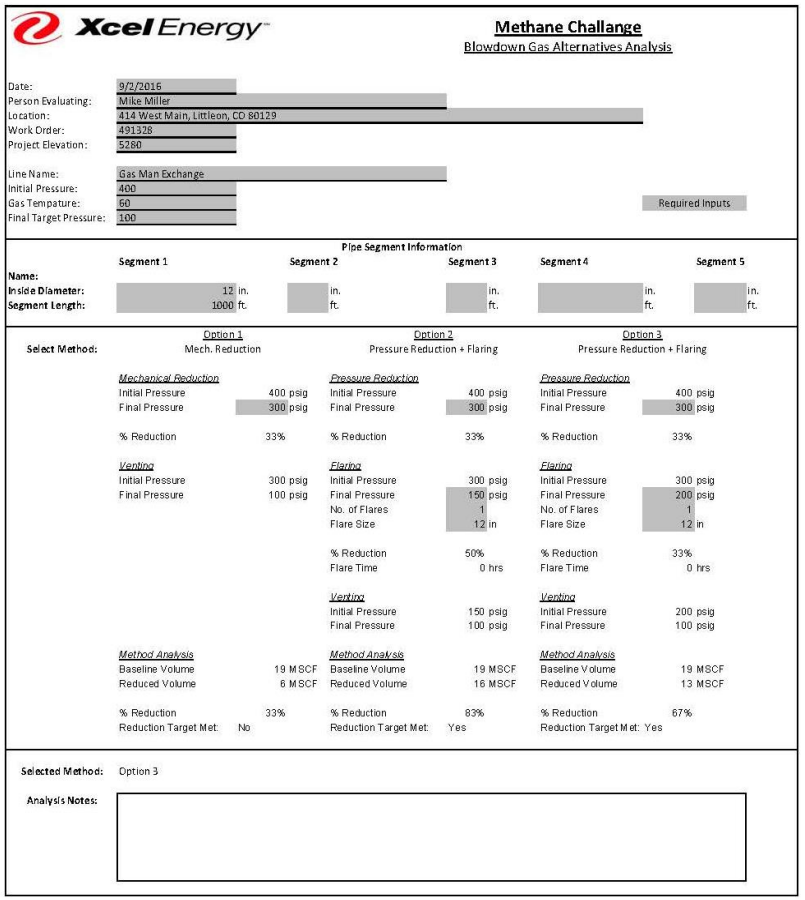
Implementation Plan



Blowdown Planning Strategies

- **Tipping point analysis indicates that past blowdown events could have achieved 50% goal through use of flaring**

- **Recommended Reduction Strategies:**
  1. Primary options of pressure reduction through system use
  2. Use flaring equipment to further reduce emissions
  3. Mechanically capture through portable compressors (~$15-30K)
  4. Use line stop fittings to reduce the pipeline segment length (~$5-40K per fitting)
     Only if fittings are necessary for other issues (e.g. bypass, downstream impacts)



Xcel Energy

Methane Challange
Blowdown Gas Alternatives Analysis

Date:	9/2/2016
Person Evaluating:	Mike Miller
Location:	414 West Main, Littleon, CO 80129
Work Order:	491328
Project Elevation:	5280
Line Name:	Gas Man Exchange
Initial Pressure:	400
Gas Tempature:	60
Final Target Pressure:	100

Required Inputs

Pipe Segment Information

	Segment 1	Segment 2	Segment 3	Segment 4	Segment 5
Name:					
Inside Diameter:	12 in.	in.	in.	in.	in.
Segment Length:	1000 ft.	ft.	ft.	ft.	ft.

Select Method:	Option 1 Mech. Reduction	Option 2 Pressure Reduction + Flaring	Option 3 Pressure Reduction + Flaring
Mechanical Reduction / *Pressure Reduction*			
Initial Pressure	400 psig	400 psig	400 psig
Final Pressure	300 psig	300 psig	300 psig
% Reduction	33%	33%	33%
Venting / *Flaring*			
Initial Pressure	300 psig	300 psig	300 psig
Final Pressure	100 psig	150 psig	200 psig
No. of Flares		1	1
Flare Size		12 in	12 in
% Reduction		50%	33%
Flare Time		0 hrs	0 hrs
Venting			
Initial Pressure		150 psig	200 psig
Final Pressure		100 psig	100 psig
Method Analysis			
Baseline Volume	19 MSCF	19 MSCF	19 MSCF
Reduced Volume	6 MSCF	16 MSCF	13 MSCF
% Reduction	33%	83%	67%
Reduction Target Met:	No	Yes	Yes

Selected Method: Option 3

Analysis Notes:

Flaring Lessons Learned

Fully set up 30 foot portable flare

30 foot portable flare

2” HP Hose Feeding Flare

Flaring Lessons Learned

- **Xcel Energy piloted a flaring trailer operation in multiple locations in Colorado**
- **Public interest and concern ranged from low to high**
  - Vail Residents and fire department extremely concerned
  - Other areas were surprisingly less concerned
- **Internal culture also problematic, certain service operating bases were more comfortable than others**
- **Primary advantages:**
  - Ability to choose where to locate flame and heat
  - More control over burn and safer to operate
  - Less noisy
- **Disadvantages:**
  - Costly compared with traditional methods
  - More set up time
  - Requires approximately 40 feet of clear space to set up
  - Flame draws attention

Questions?

Steve Martz – Manager, Gas Planning
303-294-2676
Stephen.martz@xcelenergy.com