



# PTF 2014 - Business Meeting Agenda

Welcome and safety message

Gas Operations Update

California Gas Transmission Update

Gas and Electric Coordination

Gas Transmission and Storage Rate Case Update

What have we done for our customers this year?

Logistics for the afternoon

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Neil Bhakta  
Account Manager

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Jesus Soto  
Senior Vice President, Engineering, Construction, and Operations

## California Gas Transmission Update

Mel Christopher  
Senior Director, Gas System Operations  
Anders Johnson  
Director, Gas System Planning

## Gas and Electric Coordination

Steve Whelan,  
Director, Wholesale Marketing and Business Development

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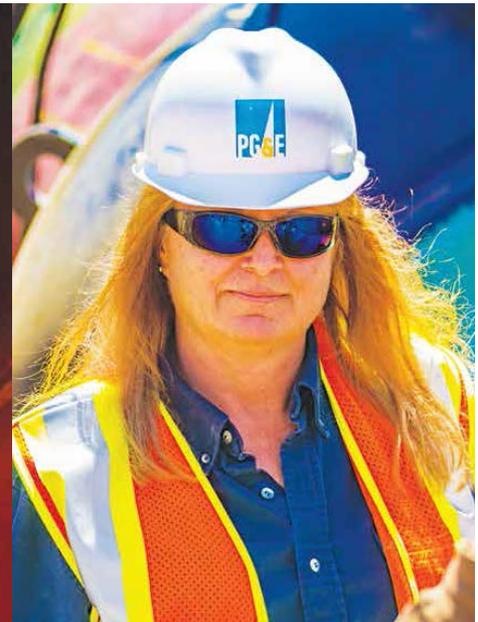
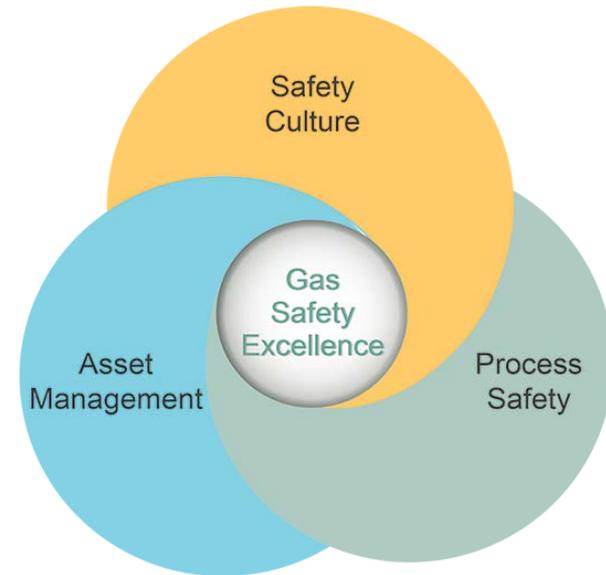
We will be the safest, most reliable gas company in the United States



# Our Strategy: Gas Safety Excellence

## We will deliver gas safety excellence by:

- Putting **SAFETY** and people at the heart of everything
- Investing in the **RELIABILITY** and integrity of our gas system
- Continuously improving the effectiveness and **AFFORDABILITY** of our processes



- Strength test or validate strength-test records to meet the standard for “traceable, verifiable, and complete” records
- Collected & digitized over 3.8 million pipeline records
- Completed MAOP validation of all 6,750 miles of transmission pipe
- Closed 9 of 12 NTSB Recommendations



Pipe Replacement

Replace  
**143 miles**



Valve Automation

Automate  
**217 valves**



ILI Retrofit

Retrofit  
over  
**304 miles**



Strength Testing

Strength  
test  
**658 miles**

- Picarro based car mounted gas methane leak detection (1ppb)
- Casing inspection robot through vents
- GPS based damage prevention tool alerts control room when equipment digs close to assets
- Multi Diameter Robotic ILI Tools (Explorer)
  - Laser-based sensor that detects and measures mechanical damage and ovality
  - Electromagnetic acoustic transducer and transverse MFL crack sensor
  - Sharp Bends



- Predictive and proactive data collection
- Real-time risk assessment and mitigation
- Emergency response coordination
- Co-located distribution, transmission and dispatch





# CNG/LNG: Minimize Customer Impact



LNG Tankers	10
LNG Vaporizers	9
CNG Modules & Trailers	172

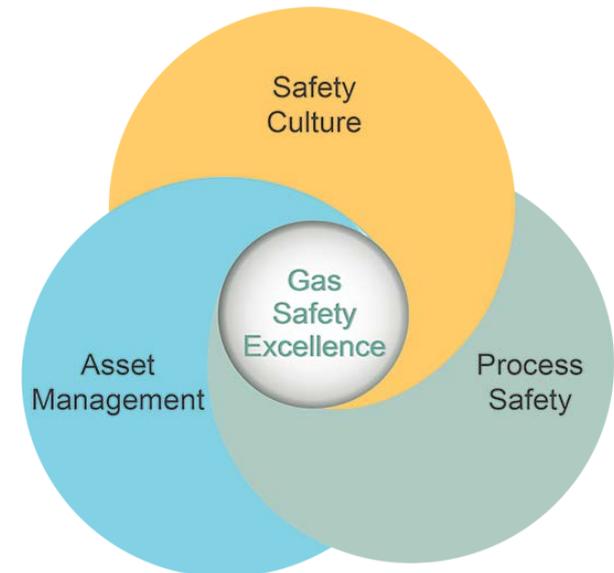


## Gas Safety Excellence

- Effectively manage risk and improve performance (asset management)
- Embed safety into the design and maintenance of all of our assets by identifying and analyzing hazards (process safety)
- Encourage employees to report safety issues through an integrated corrective action program designed to identify and track issues (safety culture)

## PAS55 / ISO55001 Certification

- Globally-recognized specifications for best-in-class operational standards for asset management
- Administered by independent, international auditor Lloyd's Register



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# Agenda

- 1. Pipeline Overview**
  - a. Changes from 2013 to 2014
  - b. Capacity schematics
- 2. Market Overview and response to capacity reductions**
- 3. Planned maintenance impact on capacity**
- 4. Winter Operations Outlook and what we learned from last winter**
- 5. Impacts of Emergent Issues and PG&E Response**



# System Wide Operating Summary

2013



2014



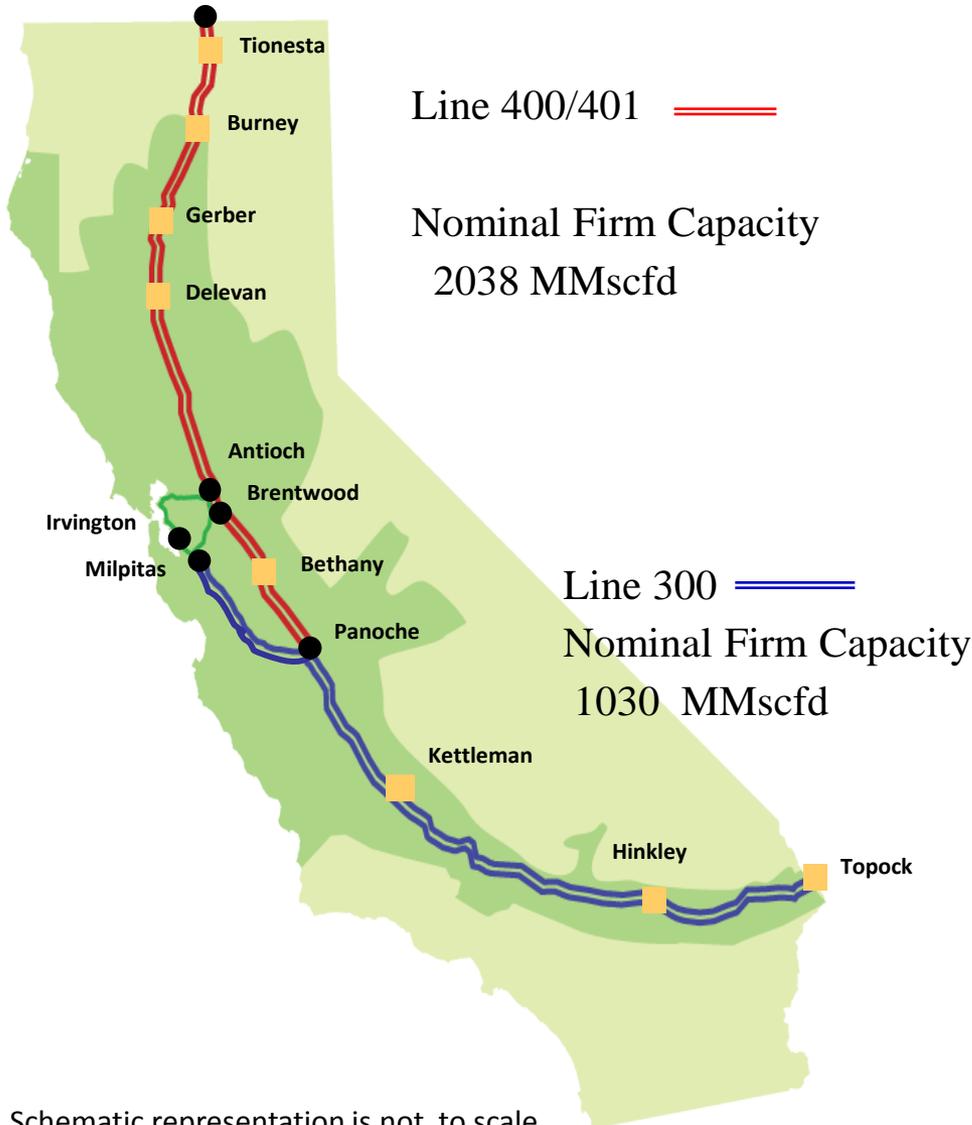
Amber November  
Green December+

Storage Full

Storage ~85%



# Backbone – Pipeline Capacity



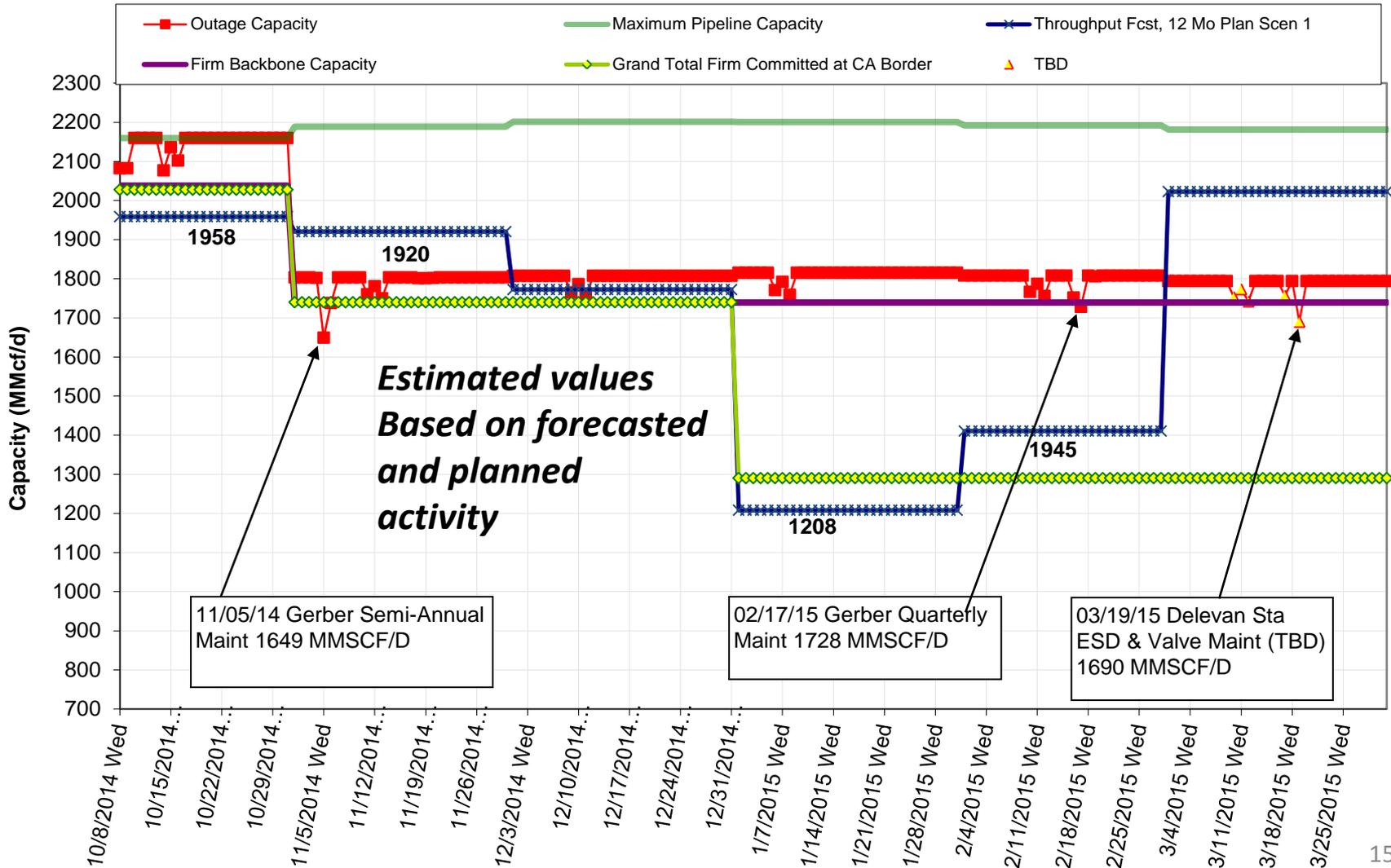
**Multiple pipeline maintenance projects temporarily reduce capacity**

- **Redwood** 1740 MMscfd
- **Baja** 800 MM (Nov)
- **Baja** 1030 MM (Dec)

Schematic representation is not to scale  
All values are nominal values



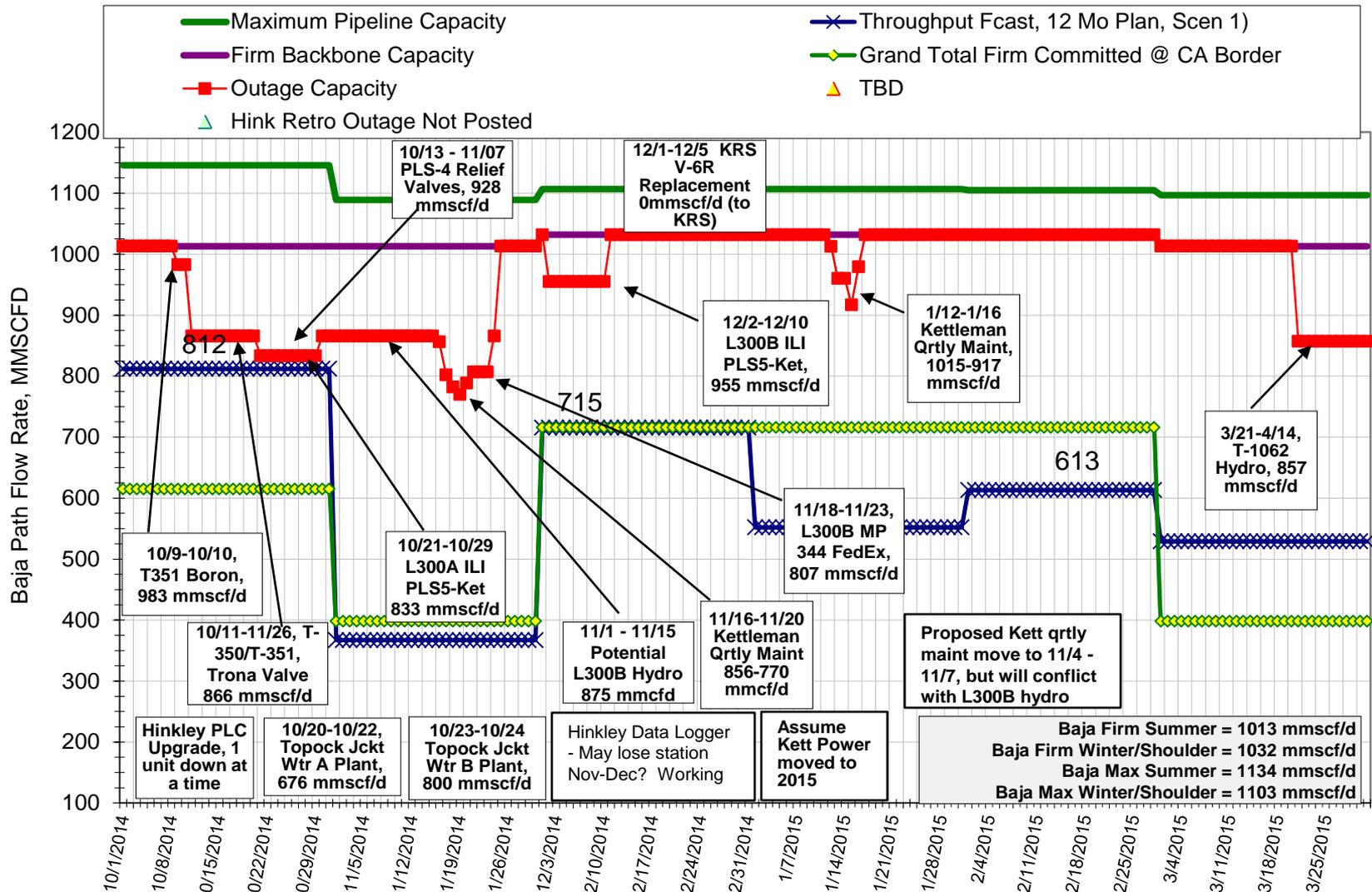
# Redwood Outage Capacity (Oct 14 - Mar15)





# Baja Path Outage Capacity (Oct\_14 – Mar\_15)

Baja Capacity based on Medium Inventory, KRS Q = 0 mmscfd and Kramer Jcn Q = 0 mmscfd





# Pipe Ranger Maintenance Posting

[http://www.pge.com/pipeline/operations/pipeline\\_maintenance/foghorn.shtml](http://www.pge.com/pipeline/operations/pipeline_maintenance/foghorn.shtml)



## California Gas Transmission

### Pipe Ranger

About CGT

Products

Tools & Services

Operating Data

Reference/Library

Operating Data

Current Pipeline Status

Forecasts

Historical Archives

Gas Quality/Heating Values

### Pipeline Maintenance News

As of Sunday, October 26, 2014

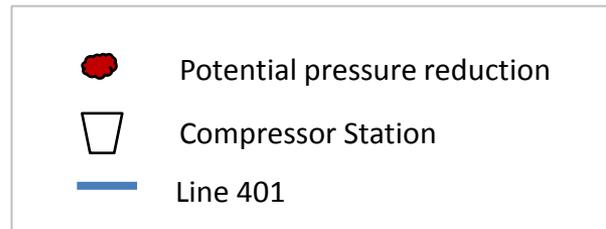
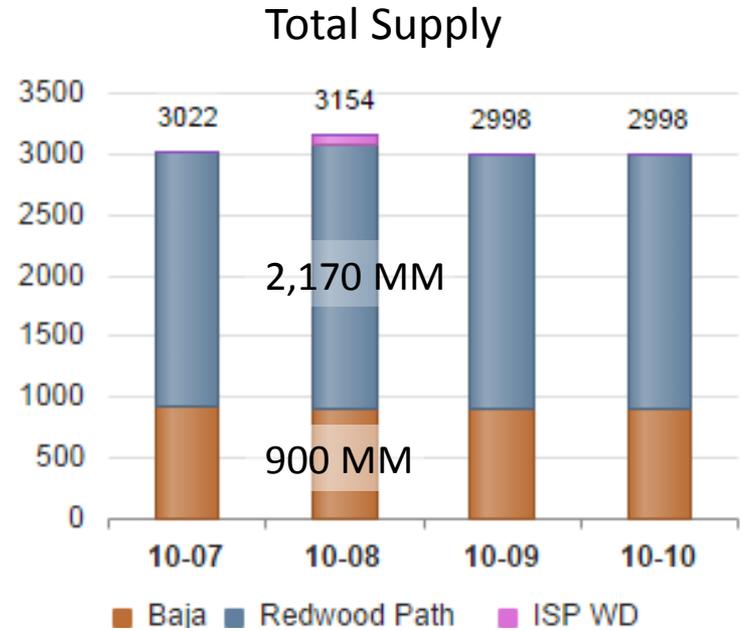
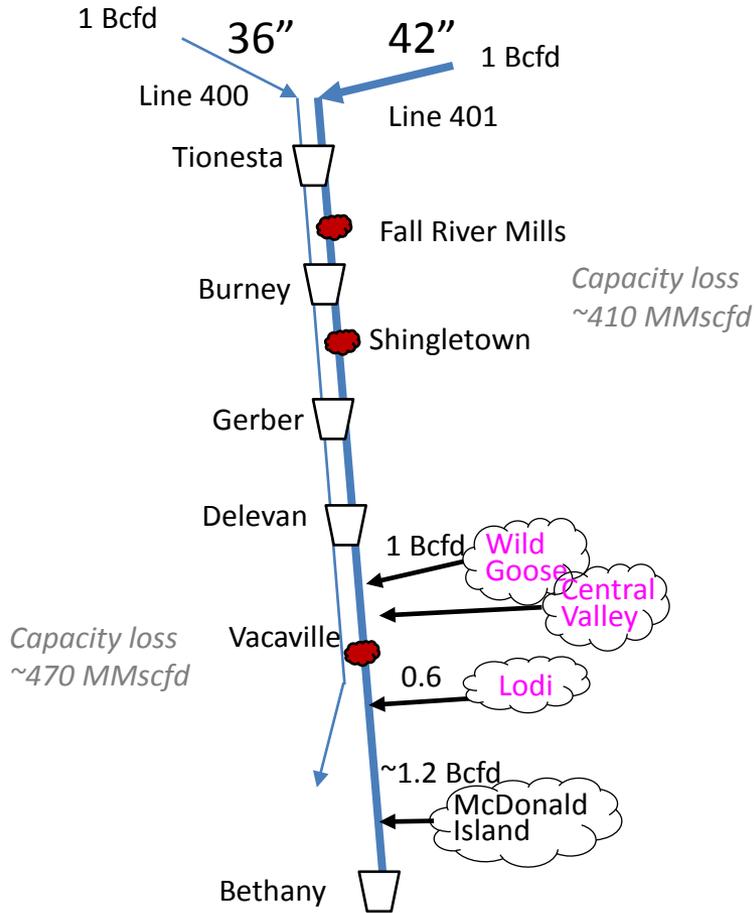
(Any day not shown is at 100% capacity)

#### Redwood Path Maintenance

Dates	Capacity (MMcf/d)	% of Max	Maintenance Notes
October 28	2150	100%	Line 401 bypass test
November 01 - 30	1803	82%	<b>NOTE: Due to pipeline pressure reductions, the Redwood Path capacity will be at approximately this level between now and June, 2015. Each month's maximum capacity will be slightly different and will be posted here. Capacity less than this level, due to other maintenance, will be posted below.</b>
November 04	1802	82%	Delevan K-1 maintenance
November 05	1649	75%	Gerber K-1 maintenance
November 06	1738	79%	Gerber K-1 maintenance



# Line 401 Pressure Reduction Impact



Schematic representation is not to scale  
 All values are nominal values subject change  
 as work is added and completed



# Market Consensus

- EIA forecasts close to “Normal” heating degree days this winter (12% lower HDDs than last winter)
- Regional temps are expected to be warmer than last year:
  - Northeast: 11% warmer
  - Midwest: 16% warmer
  - South: 12% warmer
  - West: 5% warmer
- Lower-48 marketed production continues to increase dramatically
  - EIA winter forecast of 75.3 Bcf/ day vs. 71.8 Bcf/day last winter.
  - Production increases will offset the storage shortfall
  - Production gains continue to push supplies West
  - Significant growth expected in Permian production
- Expect end-of-winter national storage level is about 1.0 Tcf higher than last year



# Pipe Ranger Committed Capacity

[http://www.pge.com/pipeline/operations/forecasts/firm\\_cap.shtml](http://www.pge.com/pipeline/operations/forecasts/firm_cap.shtml)

PG&E Pipe Ranger

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Operating Data

- Current Pipeline Status
- Forecasts
- Historical Archives
- Gas Quality/Heating Values

## Firm Capacity Commitments

PG&E's California Gas Transmission is providing information in the table below related to committed firm capacities on the Baja and Redwood Paths.

In order to get a rough estimate of an individual customer's firm cut level on any day, one can look at the relevant path capacity on the [Pipeline Maintenance News](#) page and compare it to the committed firm capacity for that month.

For example: If the posted capacity for the Baja Path is 740 MMcf/day on November 1, and the committed firm capacity for November is 779.7 MDth/day, then a rough estimation for firm volumes to flow would be 95%. Inversely, the rough estimate of levels of firm cuts would be 5%.

***Last updated: October 22, 2014***

Year / Month	Committed Capacity - Baja Path (MDth/day)	Committed Capacity - Redwood Path (MDth/day)
<b>2014</b>		
October	621.2	2047.4
November	406.2	1751.8
December	727.2	1751.8
<b>2015</b>		
January	727.2	1301.6
February	727.2	1301.6
March	406.2	1301.6



# System Winter Operations Outlook Summary



# Backbone Underground Storage Capacity



## PG&E Storage Capacity (MMcfd)

	Vol.	WD	INJ
• McDonald Island	81 Bcf	1,245	360
• Los Medanos	17 Bcf	270	75
• Pleasant Creek	2 Bcf	60	20
• Gill Ranch (25%)	5 Bcf	160	60
<b>Total</b>	<b>89 Bcf</b>	<b>1,735</b>	<b>500</b>

Estimated ~16 Bcf lower than 2013  
85% full



## Independent Storage Providers (ISP) (MMcfd)

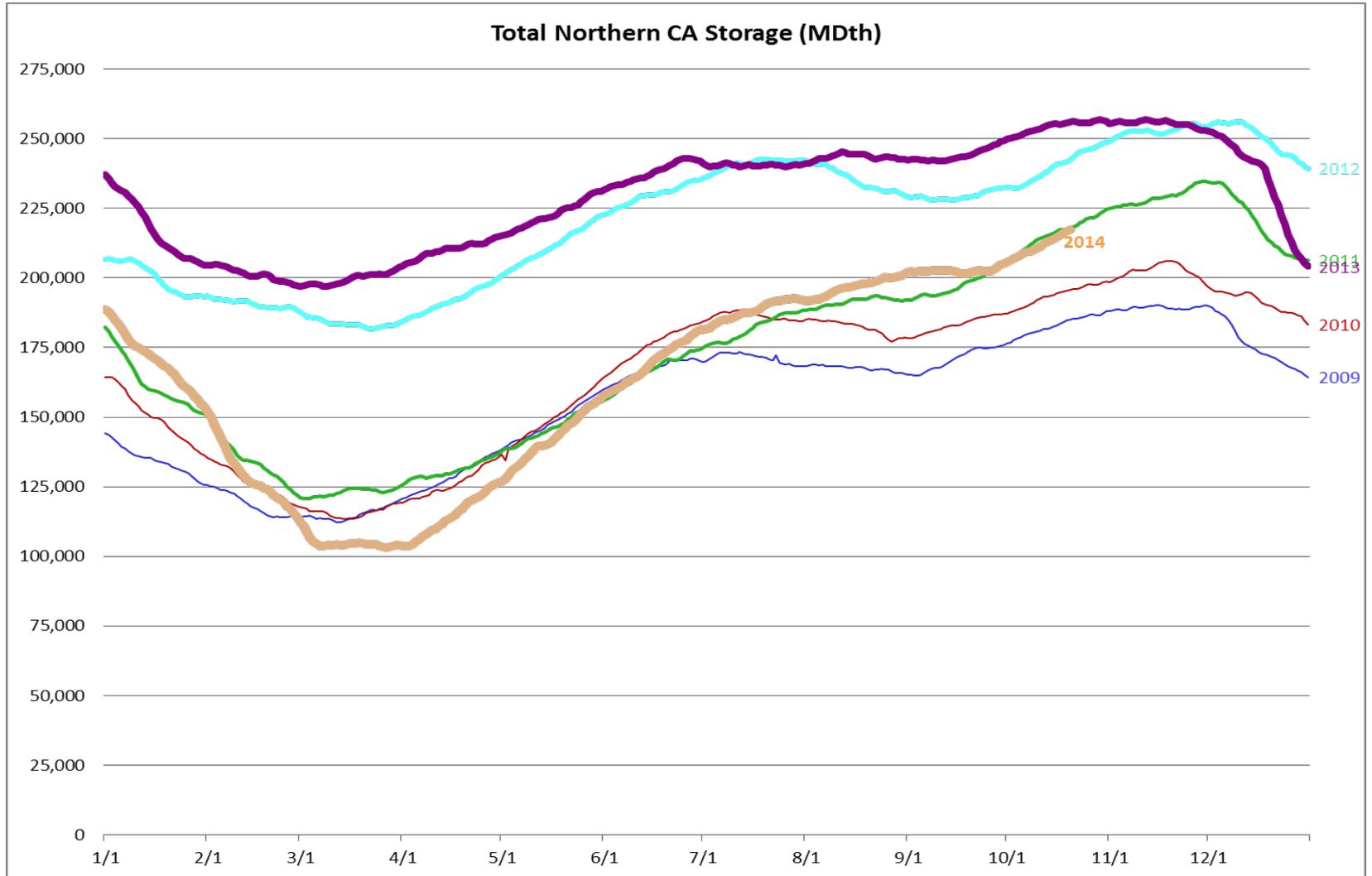
	Vol.	WD	INJ
• Wild Goose	77 Bcf	1,200	650
• Lodi Storage	30 Bcf	850	815
• Central Valley Storage	9 Bcf	300	300
• Gill Ranch Storage (75%)	18 Bcf	490	190
<b>Total</b>	<b>118 Bcf</b>	<b>2,840</b>	<b>1,955</b>

Estimated ~16 Bcf lower than 2013  
88% full

Schematic representation is not to scale  
All values are nominal values  
Capacities are base on mid-inventory



# Storage Inventory Today

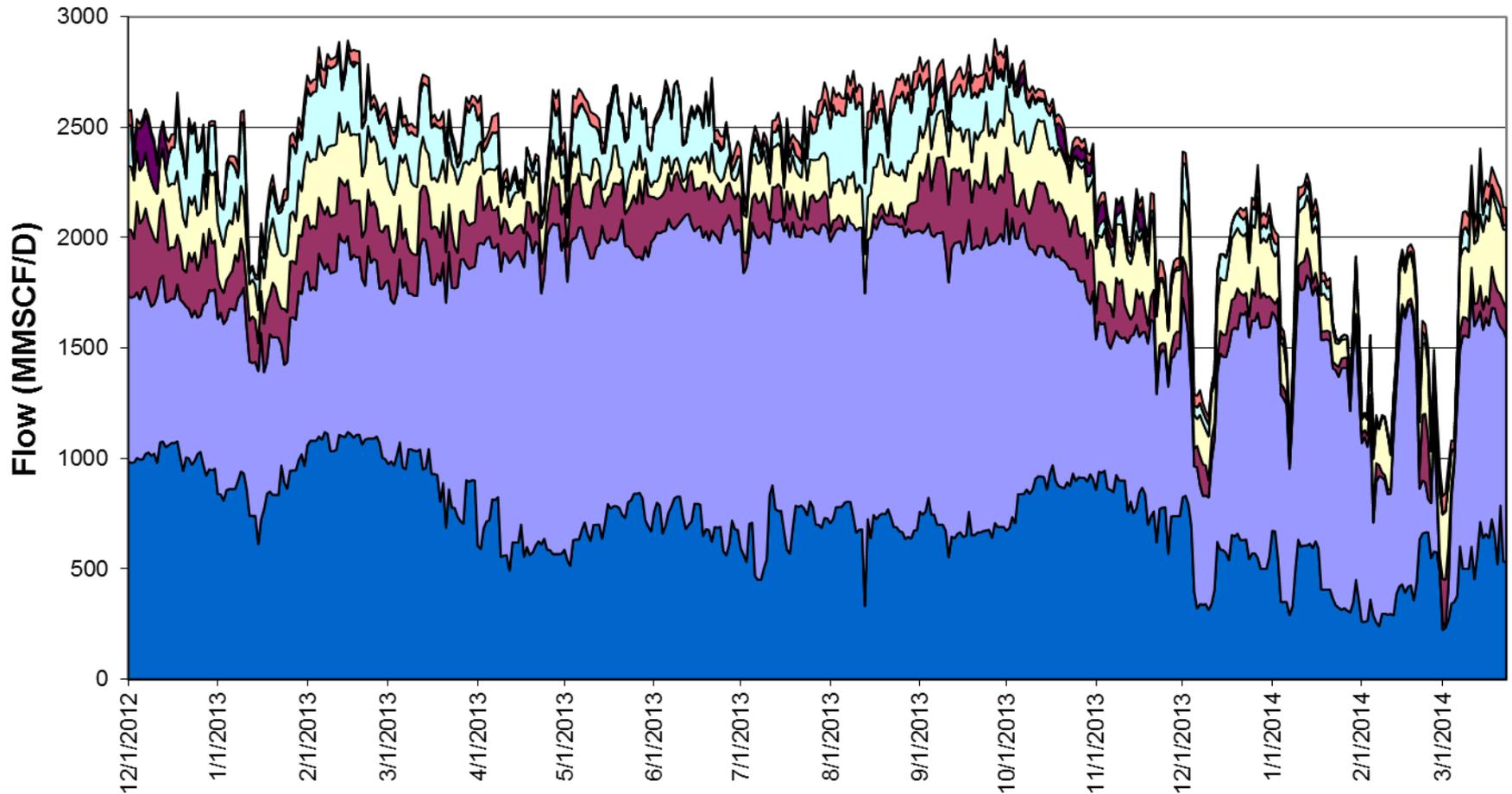




# A Tale of Two Winters

## Interconnect Supply Breakdown

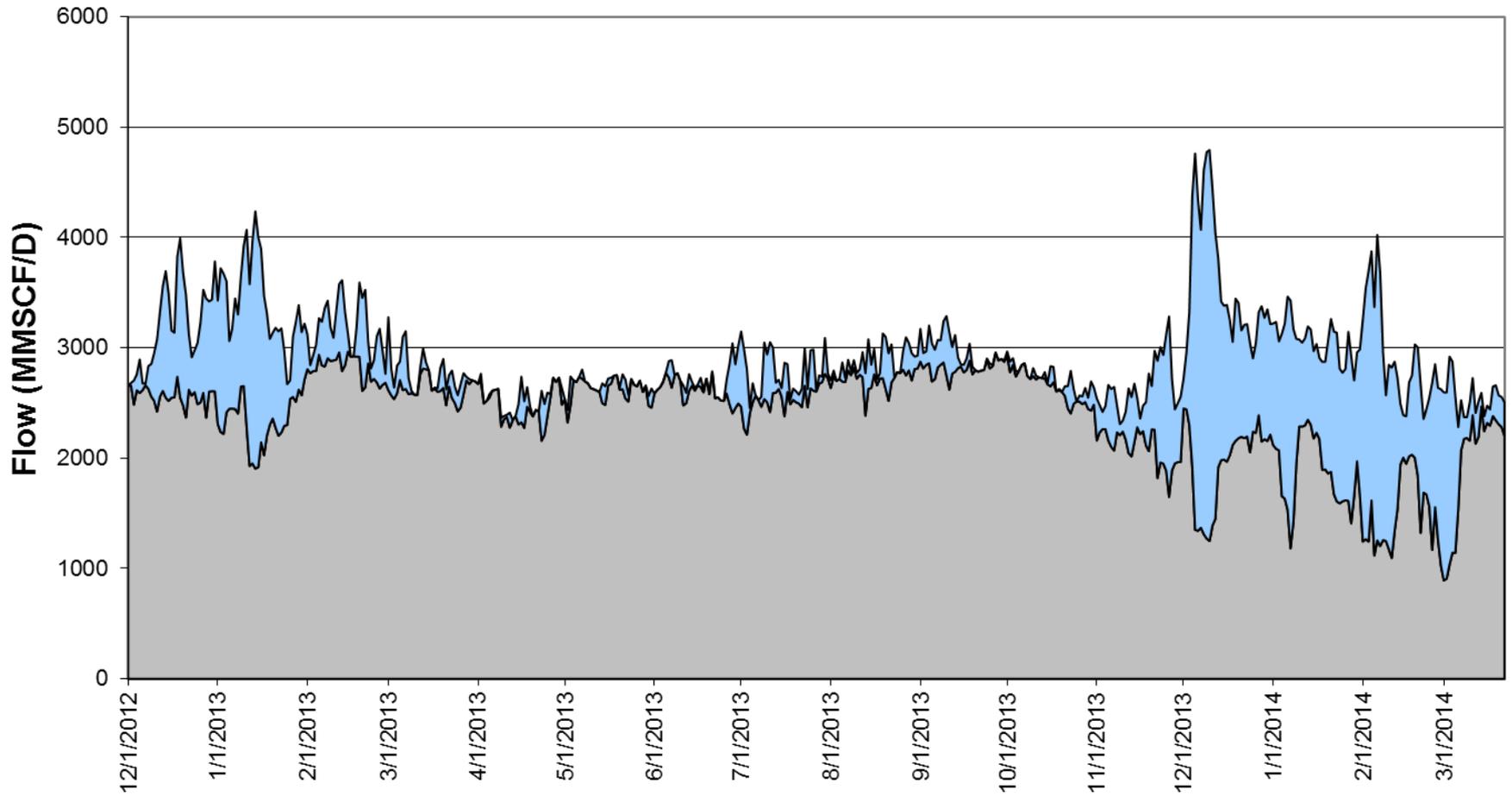
■ Ruby ■ Malin Q ■ El Paso ■ Transwestern ■ Kern Daggett ■ Kramer Junction Supply ■ Questar (Southern Trails)





# Supplies

■ Interconnect Supply Total ■ Storage Withdrawal Total





## A Tale of Two Winters

Historic Low Interconnect Flows		
<b>Baja/Line 300</b> <ul style="list-style-type: none"><li>• EPNG (1.1 Bcf capability)</li></ul>	<b>Jan 23-Feb 3</b> <ul style="list-style-type: none"><li>• Jan 28</li></ul>	<b>&lt;150 MMscf/d (11 times)</b> <ul style="list-style-type: none"><li>• 23 MMscf/d</li></ul>
<b>Redwood/Line 400/401</b> <ul style="list-style-type: none"><li>• GTN (2.1 Bcf capability)</li></ul>	<b>Feb 28-Mar 3</b> <ul style="list-style-type: none"><li>• Mar 2</li></ul>	<b>&lt;500 MMscf/d</b> <ul style="list-style-type: none"><li>• 4 MMscf/d</li></ul>



# A Tale of Two Winters

## High ISP/PG&E Storage Withdrawals

Cold Snap Peak Day	3.5 Bcf of storage delivered	73% of total supply
--------------------	------------------------------	---------------------

### High flows by single suppliers during December Cold Snap

- PG&E – nearly 30% of supply during coldest days
- Wild Goose – nearly 20% of supply during coldest days

High storage flows in January, February (twice) and early March

High storage flows correlate with cold weather in Midwest and East



# CHALLENGES



# Challenges

- North Malin path restricted ~410 MMscfd
- Baja path restricted, monthly ~150 MMscfd
- Storage lower in 2014 than 2013 ~ 20 Bcf
- Storage maintenance in November
- Emergent Issues
- **Goal:**  
Restore Vacaville no later than November 15, 2014 to ensure capacity is available for all storage providers enabling PG&E to meet customer demands



# Emergent Issue October 24, 2014

**10-24-2014**

**~7:30 a.m. P.T.**

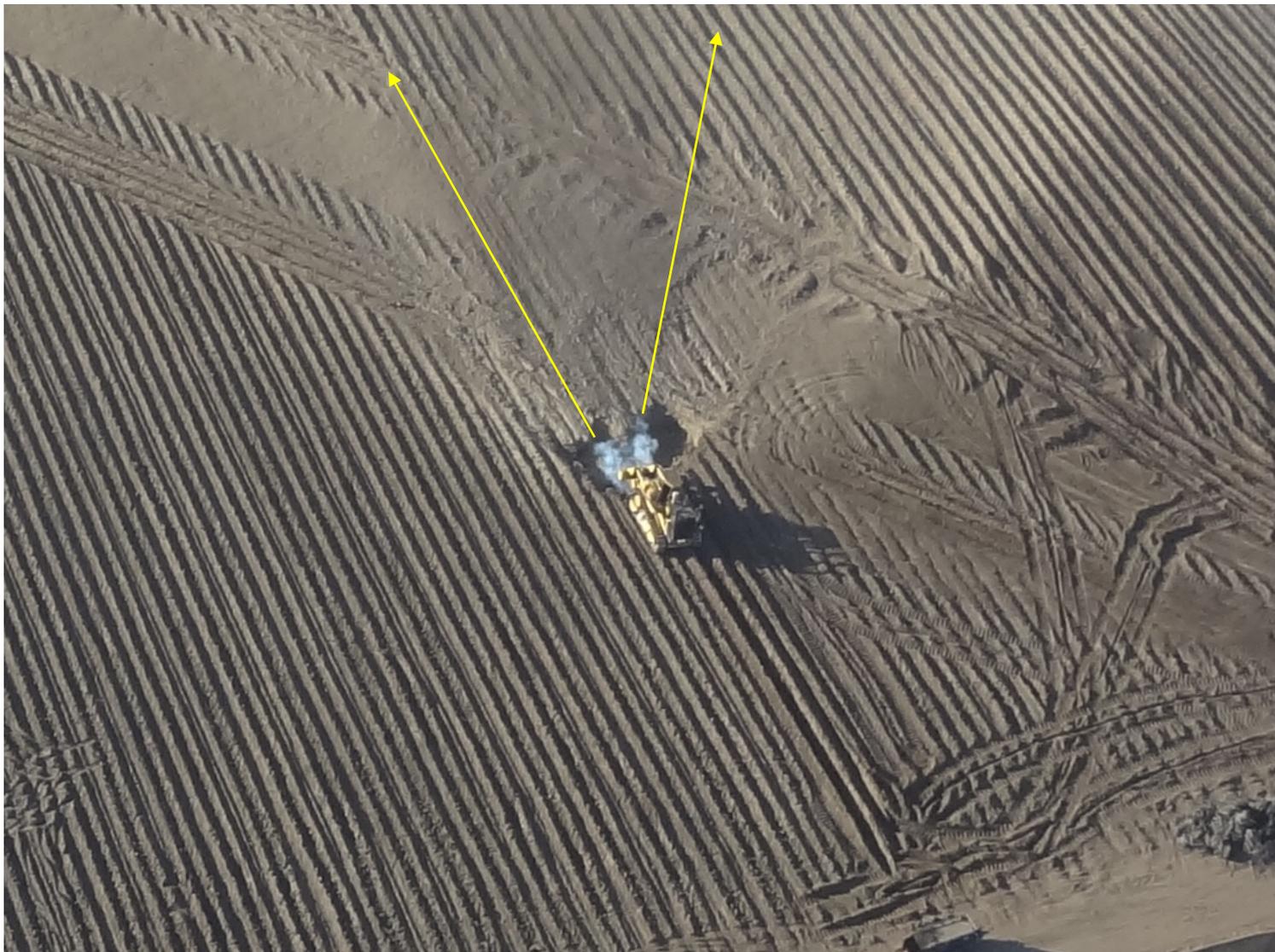
**Line 300A struck by a farmer ripping his field prior to line location**



# Farmer ripping field over Line 300A



# Gas Escaping creates a shadow



# Ripper punctures pipe creating ~12" hole





# PG&E slopes a trench prepares to cut out damaged section





# Pipe replaced service restored

- **Pipe struck Friday ~7:30 a.m.**
  - Capacity reduced from 800 MMscfd to 650 MMscfd
- **PG&E crews work all hours to restore service as safely as possible**
- **Service restored to 800 MMscfd Sunday morning**



# Conclusions

- **We're doing a lot of work to make the system safer and more reliable**
- **We will continue to be in constant communication with you when things change**
- **Questions?**

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## Summary

**The electric industry has become more dependent on natural gas for maintaining electric reliability**

**A number of friction points between the two industries have been identified that could impact electric reliability**

**Because of the critical role that the electric industry plays, the FERC has instituted a number of proceeding in an attempt to improve electric reliability**



## **Key Points of Friction**

**Pipeline capacity constraints to some major markets**

**Use of interruptible transport by generators**

**Inability to validate fuel reliability**

**Availability of gas commodity at power plant meters**

**Illiquidity in after hours trading**

**Price spikes in certain markets**

**Ability for generators to receive cost recovery for firm gas supply purchased to meet reliability needs**



## Key Points of Friction (cont.)

**Variability of electric demand**

**Need for no notice service**

**No certainty that a specific generation unit will be dispatched**

**Gas day starts in the middle of the morning peak**

**Different start times for the gas and electric days**

**Market structure/behavior that exasperated price volatility**

- ISOs committing units in advance of normal process
- Use of inaccurate price signals
- Lack of Low Inventory OFO on SoCal Gas system



## **FERC Actions**

### **Enhanced gas-electric communications (Order 787)**

### **Clarifying generator obligations and performance**

- Order clarifying that the ISO-NE tariff impose strict performance obligations and resources may not take outages due to fuel issues

### **Targeted actions to enhance fuel availability in certain regions**

- Facilitated technical conferences and meetings where 2013-2014 winter planning for New York and New England was validated

### **Approved price waivers for PJM, NYISO and CAISO**

### **Review of 2013-2014 winter events by the Office of Enforcement for market manipulation**



## Findings from Winter

**No findings of widespread market manipulation in the gas or electric markets. Three investigations into discrete market actions have been opened (one gas and two electric)**

**NERC report on Polar Vortex found the outage rate for gas fired generation was significantly higher than expected (fuel availability and design sighted as primary causes).**



## Ongoing Activities at FERC

### Initiatives to evaluate and discuss price formation, capacity markets, and seams issues

- FERC Price Formation workshops (focus on uplift payments),
- Joint FERC-NYPSC Technical Conference on centralized capacity markets

### Gas-electric coordination

- Gas-electric scheduling and start of gas day NOPR,
- Commissioner Moeller gas trading platform meeting

### Data Request to Regional Entities

- Changes to improve awareness of generation temperature design limits
- Outreach activities to ensure preparedness for this winter, and
- Changes to seasonal planning studies to account for extreme weather and generation loss.

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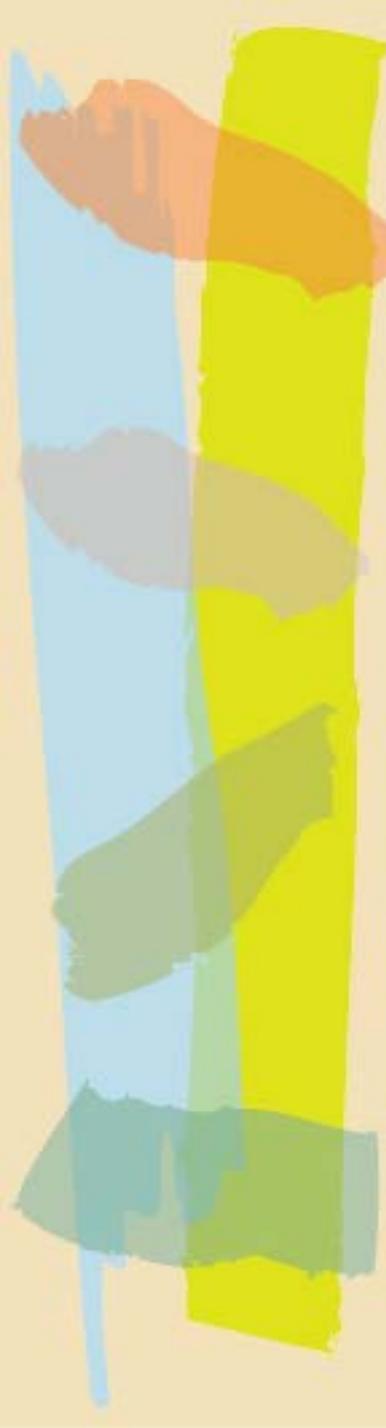


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# Gas Transmission and Storage Rate Case (GT&S)

- Filed December 2013
- Intervener testimony August 2014
- Rebuttal testimony September 15<sup>th</sup>
- Hearings {February or March 2015?}
- Briefs {April 2015?}
- Proposed decision in 2015
- New rates???



# Key Drivers

- Investment toward achieving industry “best practices” for gas transmission, consistent with Senate Bill 705
- New CPUC requirement to strength test all pipelines that have not been previously tested (Grandfathered pipelines)
- Direction in GRC for risk based prioritization
- Continued investment in gas transmission and storage infrastructure to improve the safety and reliability of the system and address identified risks
- Need for new capacity-driven additions in the local transmission system

# GT&S Rate Case

- PG&E is proposing a substantial rate increase for backbone services and end-use customers

Rate	Proposed		
	2014	TBD	% Increase
<b>Backbone</b>			
Noncore Redwood	\$0.266	\$0.512	92.0%
Noncore Baja	\$0.306	\$0.512	67.0%
<b>End-Use</b>			
Electric Gen T&D	\$0.497	\$1.003	102.1%
Electric Gen Backbone	\$0.161	\$0.123	-23.7%

# New Rates for January 1, 2015

- Draft Annual Gas True-up filing November 4, 2014
- Final rates on December 23, 2014

Rate	2014	2015	% Increase
<b>Backbone</b>			
Noncore Redwood	\$0.266	\$0.290	8.7%
Noncore Baja	\$0.306	\$0.330	7.9%
<b>End-Use</b>			
Electric Gen T&D	\$0.560	\$0.310	-44.6%
Electric Gen Backbone	\$0.200	\$0.100	-50.0%

# Items Specific to Backbone Shippers

## Fifth nomination cycle in response to additional renewable generation

- 3<sup>rd</sup> intraday cycle
- Nominations due at 9 p.m.
- Flow starting at 11 p.m.
- FERC is working on other potential alternatives

## INSIDetracc enhancements and replacement

- Nomination Redirect
- System replacement in 2017

## Same price for the Baja and Redwood Path

- Currently \$0.04 with Baja more expensive

## Increase the storage capacity allocated to load balancing

- Injection: current = 75 MMcf/d, proposed = 130 MMcf/d
- Withdrawal: current = 75 MMcf/d, proposed = 200 MMcf/d
- Capacity is used to address intraday supply and demand imbalances

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# Meter Data Reliability is Getting Well... More Reliable

## Infrastructure Improvements

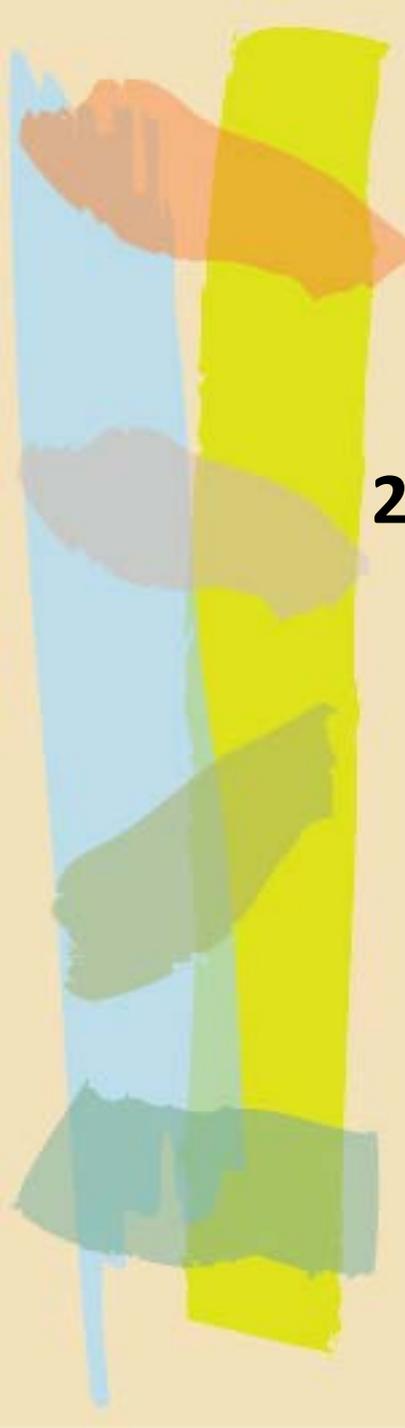
Reliability of Meter usage data in *INSIDEtracc* is **98.8%** since July 2014, up from **87%** in November 2013.

- What did it take to accomplish this?  
Focus on Infrastructure in 2014:
  - » Daily Gas Ops Senior Leadership visibility
  - » Committed teams addressing complex issues
  - » Root causes, advocacy, alliance-building, metrics

## Processing Improvement

Reliability of meter data processing in 2014 as a result of 2013 investments

- Instances of processing delays:  
17 in 2013, 4 in 2014



# INSIDE*tracc* Improvements

## **2014 System Enhancements**

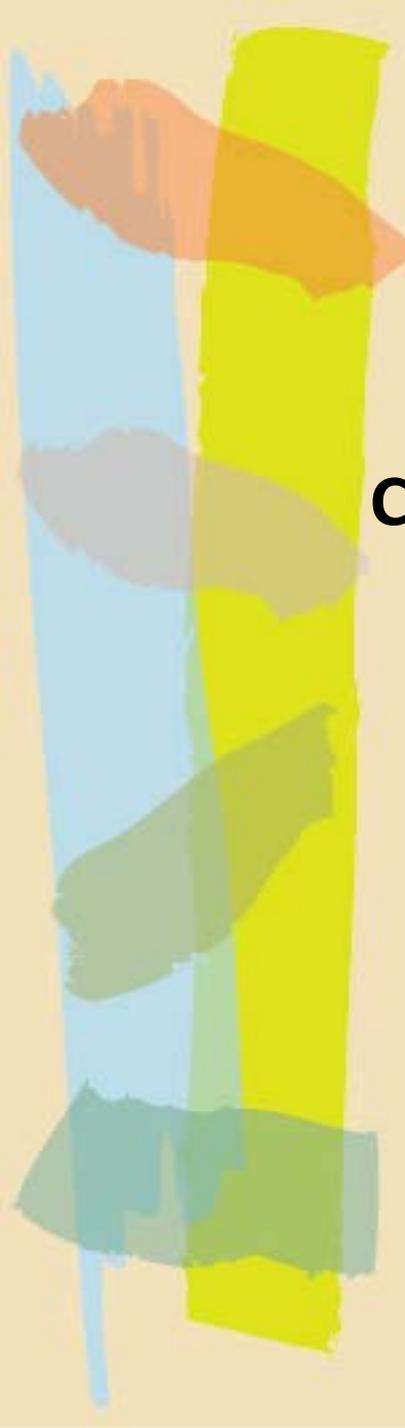
- Locked-out Nominations (flexibility)
- Hide zero-volume Nominations (easier)
- Action buttons to reduce scrolling (easier)
- Query INSIDE*tracc* User Access (security)
- Storage assignments (versatility)



# CGT Guide Redesign

## **What's improved...**

- Maps and charts
- Larger format
- Improved versatility
- Current Rates
- Who's who at CGT



# Training for Your New Hires

## **CGT Business Knowledge Training**

Customized one-on-one training by Account Manager

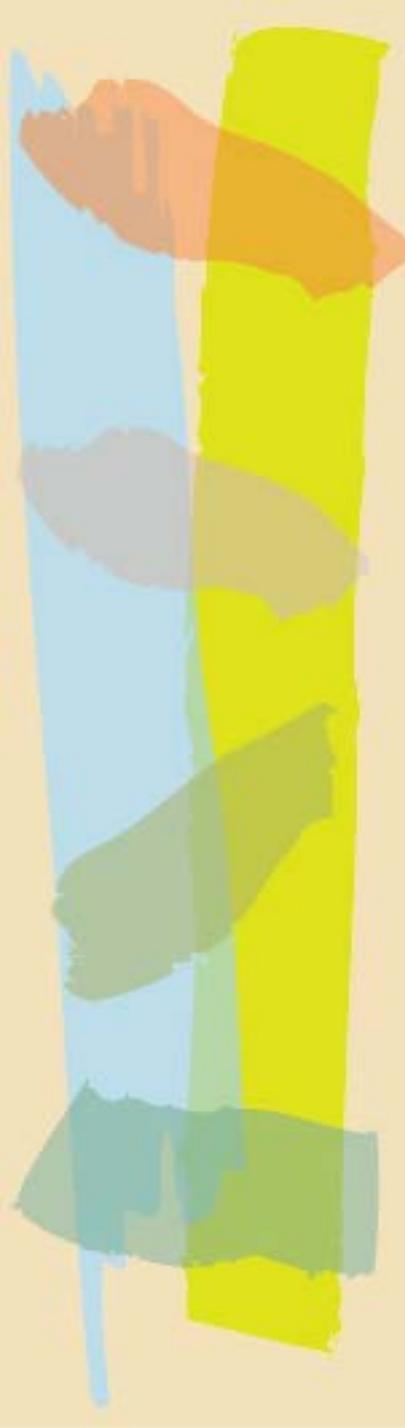
- Executing contracts with CGT
- Being a Balancing Agent
- Trading Imbalances
- Avoiding pitfalls

We are a partner to your in-house training

- Imbalance Trading Tools/OFO Tools/Resources

Customized one-on-one training by Schedulers

- *INSIDEtracc* – how to nom, run reports, understand cut codes



# Coming Attractions

## **NEW INSIDE*tracc* REPORT**

### Billed Usage by Agent-Monthly Summary Report

- Billing quality usage data
- One stop access
- Providing data faster

# The Grid



## California Gas Transmission

### Pipe Ranger

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Log in

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Operating Data
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▼ Operating Data

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Gas Quality/Heating Values

### The Grid

Gas Day: 10/1/2014 ● 10/2/2014 ● 10/3/2014

In Excel  
 As a Web Page  
 In Excel

Search

Location	Gas Day: 6/23/14 Timely		Gas Day: 6/23/14 Evening		Gas Day: 6/23/14 ID1		Gas Day: 6/23/14 ID2	
	Confirmed	Scheduled	Confirmed	Scheduled	Confirmed	Scheduled	Confirmed	Scheduled
<b>Receipts</b>								
Gas Trans Northwest (Malin)	500	451	436	500	451	436		
Ruby (Onxy Hill)	172	169	162	172	169	162		
California Production	345	337	222	345	337	222		
SoCal Gas (Kern River Station)	54	20	135	54	20	135		
KRGT - HDL (Freemont Peak)	45	45	87	45	45	87		
KRGT - (Daggett)	560	557	427	560	557	427		
Questar Southern Trails (Essex)	445	444	234	445	444	234		
Transwestern (Topock North)	171	160	156	171	160	156		
El Paso (Topock South)	21	21	122	21	21	122		
<b>Deliveries</b>								
Gas Trans Northwest (Malin)	432	430	503	432	430	503		
Ruby (Onxy Hill)	142	112	111	142	112	111		
SoCal Gas (Kern River Station)	78	74	98	78	74	98		
KRGT - HDL (Freemont Peak)	97	91	127	97	91	127		
KRGT - (Daggett)	127	119	333	127	119	333		
Questar Southern Trails (Essex)	423	404	45	423	404	45		
Transwestern (Topock North)	87	78	237	87	78	237		
El Paso (Topock South)	171	164	201	171	164	201		
<b>Storage</b>								
Injections	567	543	237	567	543	237		
Withdrawals	134	130	261	134	130	261		

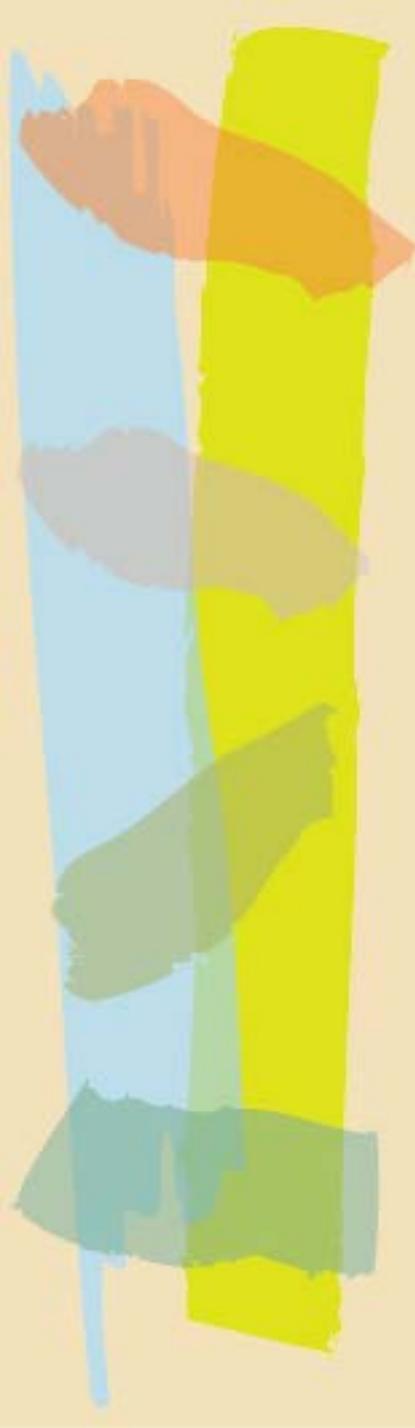
All numbers are expressed in MMcf/d.

All numbers are expressed in MMcf/d. Archive data shown here is from Pacific Gas and Electric Company's California Gas Transmission final operating plan for the gas day. It represents estimates made the day after flow day, prior to the availability of metered or billing-quality data. This data is not audited nor adjusted if more accurate data becomes available.

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# The Grid



 **California Gas Transmission**  
Pipe Ranger

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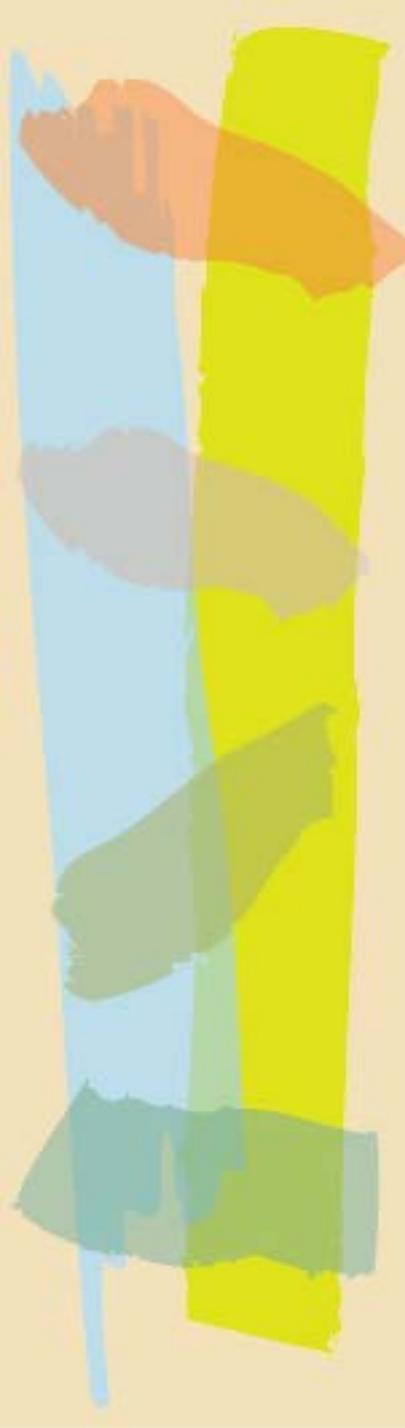
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### OFO/EFO Outlook

Last Updated Wednesday, October 29, 2014 at 7:23am



# Pipe Ranger Contest Winners

Winners !!!

**Lisa Burton, Mercuria** **1270 points**

**Nikki Palacio, Mercuria** **1180 points**

**Rick Pratt, SoCal Edison** **1070 points**

**Monica Sinclair, BP** **995 points**

**Brett Bingham, Macquarie** **955 points**

# Pipe Ranger Contest Winners

## Honorable mention for PTF Attendees

**Phil Richardson**

635 points = 11<sup>th</sup> place

Chevron

**Walter Cinibulk**

350 points = 12<sup>th</sup> place

Pacific Summit

**Jim Hemmerly**

155 points = 17<sup>th</sup> place

ConocoPhillips

**Mike Kowalewski**

60 points = 27<sup>th</sup> place

PG&E Electric Fuels