



U.S. Environmental Protection Agency Natural Gas STAR Program

Gas STAR Online BMP Management System

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Overview

- ★ Web-based BMP Management and Reporting Tool for Methane Reductions
- ★ Funded by Devon Energy Corporation
- ★ Developed by COMM Engineering and Louisiana State University – Dr. Gerry Knapp



Overview



★ Rationale

- Centralize data – eliminate spreadsheets
 - Access from anywhere
 - Simplify reporting
 - Simplify management
- ★ Application code will be available for free to industry through EPA

BMPs Covered



- ★ AOF Tests
- ★ Convert Engine Starting to N2
- ★ Flares
- ★ Gas Controls to Instrument Air
- ★ Generic Reductions
- ★ Glycol Dehy Reductions
- ★ Green Completions
- ★ Install Static Pacs at Compressor Station
- ★ Plunger Lift
- ★ Pneumatic Controllers
- ★ Reduce Glycol Circulation Rate
- ★ Replace Gas with Electric Glycol Pump
- ★ Replace NG Engine with Electric Motor
- ★ Replace Wet Seals with Dry Seals
- ★ Vapor Recovery Units (VRUs)

Login Screen

login - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites Recycle Bin Mail Print Camera Taskbar

Address <http://si04.imse.lsu.edu/gknappws/devon/login.aspx> Go Links

Natural Gas STAR Program

GasStar Logon

Username:

Password :

[Forgot password? Click here](#)

Done Internet



BMP Management System – Main Screen

BMP
Users
Facilities
Reporting

Natural Gas STAR Program

Grouping: Div/Fld

(All BMPs)

- Central
- Eastern
- Gulf
- Midstream
- Southern
 - Carthage
 - Groesbeck
 - South Texas
- Western
 - House Creek Field**
 - Indian Basin
 - Permian
 - Rockies

BMPs: Western / House Creek Field

Add new BMP Add new / go to detail * - indicates required field for adding a new record

Division	Western	BMP Type	Green Completions	Number of Occurrences	4
Field	House Creek Field	Start Date:	8/27/2005	Reduct. per Occur. (Mcf)	625
Facility	House Creek Sussex Unit E	Compl. date:		Total Reduction (Mcf)	2500
Well	(select well [opt])	Description			

Save Edits Grouping: Div/Fld/Fac

Division: Western									
Field: House Creek Field									
Facility: House Creek Sussex Unit Battery									
	Well	Type	Brief Desc	Start date	End date	Num Occur	ARR/occ(Mcf)	Total ARR(Mcf)	Details
Delete		Static Pac		10/15/2002		4	3.81	15.25	view/edit
Delete		Green		08/15/2005				200	view/edit
Delete		Generic		11/15/2003		4	3.68	14.7	view/edit
Delete		Dry Seal		04/15/2003		3	44.13	132.39	view/edit
Delete		NG Engine		11/15/2004		3	33.39	100.17	view/edit
Delete		Gly Pump		10/15/2004		3	29.98	89.93	view/edit
Delete		AOF		08/15/2005		1	66	3.96	view/edit
Delete		AOF		08/15/2005				66	view/edit
Delete		AOF		08/15/2005				66	view/edit
Delete		Inst Air		09/15/2002		4	30.46	121.83	view/edit
Delete		N2		12/15/2004		4	50	200	view/edit
Delete		N2		03/15/2003		1	39.04	39.04	view/edit
Facility: South Battery (House Creek Field)									
	Well	Type	Brief Desc	Start date	End date	Num Occur	ARR/occ(Mcf)	Total ARR(Mcf)	Details
Delete		Green		02/15/2004		3	34.9	104.69	view/edit
Delete		Green		09/15/2003		2	9.14	18.28	view/edit
Delete		Dehy Reduc		07/15/2005		4	15.22	60.9	view/edit

BMP Management System – BMP Detail / Calcs



Natural Gas STAR Program



BMP: Replace Wet Seals with Dry Seals

* - indicates required field

Location (Western > House Creek Field > South Battery (House Creek Field))


Project Information

In Service (Start) Date	8/15/2005	*
Completion (End) Date		
Est. Duration (yrs)	5	*
Number Units Installed	1	
Mole Fraction (%)	86	
ARR Per Unit (Mcf/yr)	35165	
ARR (Mcf/yr)	35165	*
Calculation Method		
Brief Description		
Planned Future Activities		
Comments / Additional Benefits		
Gas Price (\$/Mcf)		
Total Value Gas Saved (\$)		
Project Present Worth (\$)		



BMP Detail / Calcs

Natural Gas STAR Program



BMP: Replace Wet Seals with Dry Seals

* - indicates required field

Location (Western > House Creek Field > South Battery (House Creek Field))

Project Information

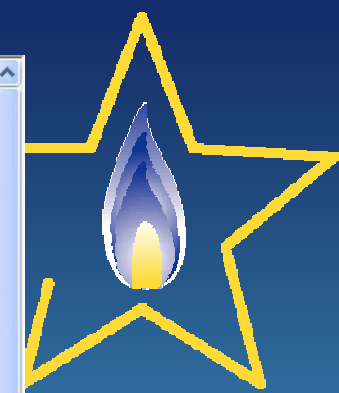
In Service (Start) Date	8/15/2005 *
Completion (End) Date	
Est. Duration (yrs)	5 *
Number Units Installed	1
Mole Fraction (%)	86
ARR Per Unit (Mcf/yr)	35165
ARR (Mcf/yr)	35165 *
Calculation Method	
Brief Description	
Planned Future Activities	
Comments / Additional Benefits	
Gas Price (\$/Mcf)	
Total Value Gas Saved (\$)	
Project Present Worth (\$)	

ARR Calculator

(calculator requires number of units and mole fraction have been entered)




Hours Operates Per Year (hrs/yr)	7250
Number Seals Per Compressor	2
Wet Seal Leakage Factor (scfm/seal)	50
Dry Seal Leakage Factor (scfm/seal)	3
Calculated ARR (Mcf/yr)	35165

Cancel Calc Set ARR



BMP Detail / Calcs

Natural Gas STAR Program







BMP: Replace Wet Seals with Dry Seals

* - indicates required field

Location (Western > House Creek Field > South Battery (House Creek Field))

Project Information

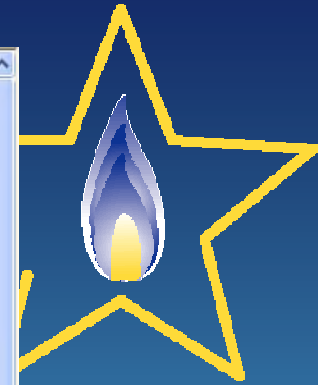
In Service (Start) Date	8/15/2005	*
Completion (End) Date		
Est. Duration (yrs)	5	*
Number Units Installed	1	
Mole Fraction (%)	86	
ARR Per Unit (Mcf/yr)	35165	
ARR (Mcf/yr)	35165	* 
Calculation Method		
Brief Description		
Planned Future Activities		
Comments / Additional Benefits		
Gas Price (\$/Mcf)	5	
Total Value Gas Saved (\$)	204448	
Project Present Worth (\$)		

Economics Calculator

(calculator requires duration, number of units, mole fraction, ARR, and gas price have been entered on the main form, and that all values on the ARR calculator have been entered)




Annual Add. Gas Revenue (\$/yr)	204448
Wet Seal Condition	functional
Shaft Diameter (in.)	6
Wet Seal Cost Factor (\$/in/seal)	5167
Wet Seal Salvage Per Unit (\$)	20668
Dry Seal Cost Factor (\$/in/seal)	10351
Dry Seal Cost Per Unit (\$)	124213
Install/Eng Cost per unit (\$)	124213
Total Initial Project Cost (\$)	227757
O&M Cost Per Unit (\$/yr)	10326
Total Annual Cost (\$/yr)	-65057
Total Annual Net Revenue (\$/yr)	269505
Project Hurdle Interest Rate (%)	12
Project Present Worth (\$)	743748

Cancel Calc
Set PW



BMP Detail / Calcs

Natural Gas STAR Program

BMP: Low Bleed Pneumatic Controllers

* - indicates required field

Location (Western > House Creek Field > South Battery (House Creek Field))

Project Information

Installation Type	Upgrade	*
In Service (Start) Date	10/15/2004	
Completion (End) Date		
Est. Duration (yrs)	5	*
Number Occurrences	8	
Mole Fraction (%)	91.39	
ARR Per Occurrence (Mcf/yr)	372.25	
ARR (Mcf/yr)	2978	*
Brief Description		
Planned Future Activities		
Comments / Additional Benefits		
Cost (Project)	8000	
Gas Price (\$/Mcf)	5	
Total Value Gas Saved (\$)	16293	
Project Hurdle Rate (%)		
Project PW (\$)		

ARR Calculator
(requires number occurrences be entered)

Before - Make/Model	Fisher 4100
Before - Gas Emission Rate (scfh)	50
After - Make/Model	Fisher 4195
After - Gas Emission Rate (scfh)	3.5
Calculation Method	
Hours of Operation Per Year	8760
Calculated ARR (Mcf/yr)	2978



User Management



BMP Users Facilities Reporting

Grouping: Divisions

+ -

(add new user)

- Gulf
- Southern
 - Boyer, Brian
- Western
 - Knapp, Gerry
 - O'Connell, Steve



(new user)

* - indicates required field

Lastname:	<input type="text" value="Truelove"/>	*
Firstname:	<input type="text" value="Ron"/>	*
Email:	<input type="text" value="Ron.Truelove@dvn.com"/>	*
Phone:	<input type="text" value="405-552-4516"/>	

Username:	<input type="text" value="Ron.Truelove"/>	*
Password:	<input type="password" value="●●●●●"/>	*
Primary Division:	<input type="text" value="Western"/>	*

(make sure user has at least view permissions on this division or one of its fields)

User Management

BMP Users Facilities Reporting

Natural Gas STAR Program

Grouping: Divisions

- (add new user)
- Gulf
- Southern
 - Boyer, Brian
- Western
 - Khapp, Gerry
 - O'Connell, Steve
 - Truelove, Ron**

Truelove, Ron

* - indicates required field

Lastname: *
Firstname: *
Email: *
Phone:

Username: *
Password: *
Primary Division: *

(make sure user has at least view permissions on this division or one of its fields)

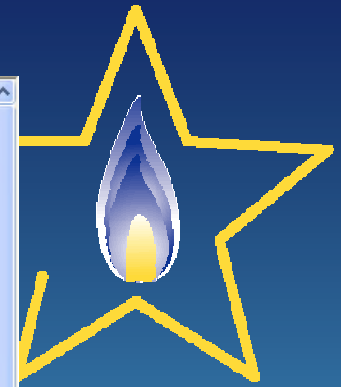
Save User Record

User Permissions:

Division	Field	Priv. Level
(ALL)	(ALL)	Admin
▶ Western	Indian Basin	View

Division: *
Field: *
Priv. Level: *

View
Edit
Admin



User Management



- ★ Manage existing users
- ★ Assign access levels – administration, view, edit.
- ★ Administration the highest access level – control of all assignment of user access
- ★ Displays all users and displays users by Divisions

Facilities Management

BMP
Users
Facilities
Reporting


Grouping: Div/Fld

+ -

(add new facility)

- Central
- Eastern
- Gulf
- Midstream
- Southern
- Western
 - House Creek Field
 - House Creek Sussex Unit B
 - South Battery (House Creek)
 - Indian Basin
 - Permian
 - Rockies

Natural Gas STAR Program



House Creek Sussex Unit Battery

Save
Manage Divisions/Fields

* - indicates required field

Division: Western *

Field: House Creek Field *

Facility Name: House Creek Sussex Unit Battery *

Contact: Joe Smith

Email: jsmith@xyz.com

Phone: 111-111-1111

Active?:

Deactivate date:

Well Data:

Well Name	Active?
A1	<input checked="" type="checkbox"/>
▶ B1	<input checked="" type="checkbox"/>
C2	<input checked="" type="checkbox"/>

Add... Wells

Production shut-ins for facility (leave startup date blank if unknown)

Shut-in Date	Startup Date	Applies To
04/01/2005	05/01/2005	Facility only
07/01/2005	07/15/2005	Facility & all wells

Add... Facility Shut-in

Production shut-ins for well selected at left (leave startup date blank if unknown)

Shut-in Date	Startup Date
04/01/2003	05/01/2003
08/12/2004	09/02/2004

Add... Well Shut-In



Facilities Management

Natural Gas STAR Program



Divisions / Fields

	Division	Field	Active	Deactivate Date
	Central	FWB	<input checked="" type="checkbox"/>	
	Southern	Carthage	<input checked="" type="checkbox"/>	
	Southern	Groesbeck	<input checked="" type="checkbox"/>	
	Southern	South Texas	<input checked="" type="checkbox"/>	
	Western	House Creek Field	<input checked="" type="checkbox"/>	
	Western	Indian Basin	<input checked="" type="checkbox"/>	
	Western	Permian	<input checked="" type="checkbox"/>	
	Western	Rockies	<input checked="" type="checkbox"/>	

Add...



Reporting

Natural Gas STAR Program



Mcf Reductions - Reporting

Report: Division Field Facility Well All Detail EPA Ongoing Shut-Ins

Include BMP type?

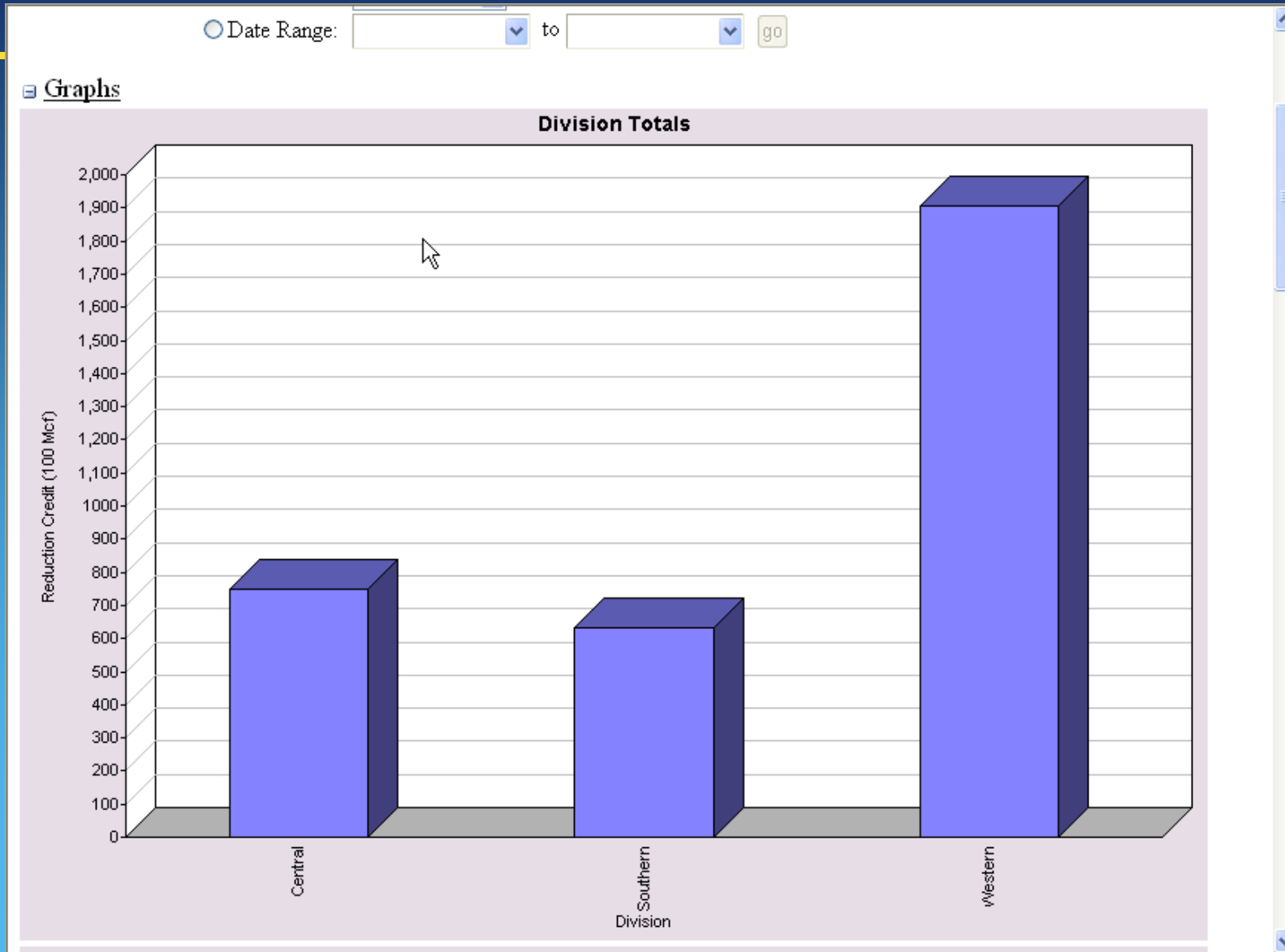
Dates Covered: Year:

Date Range: to

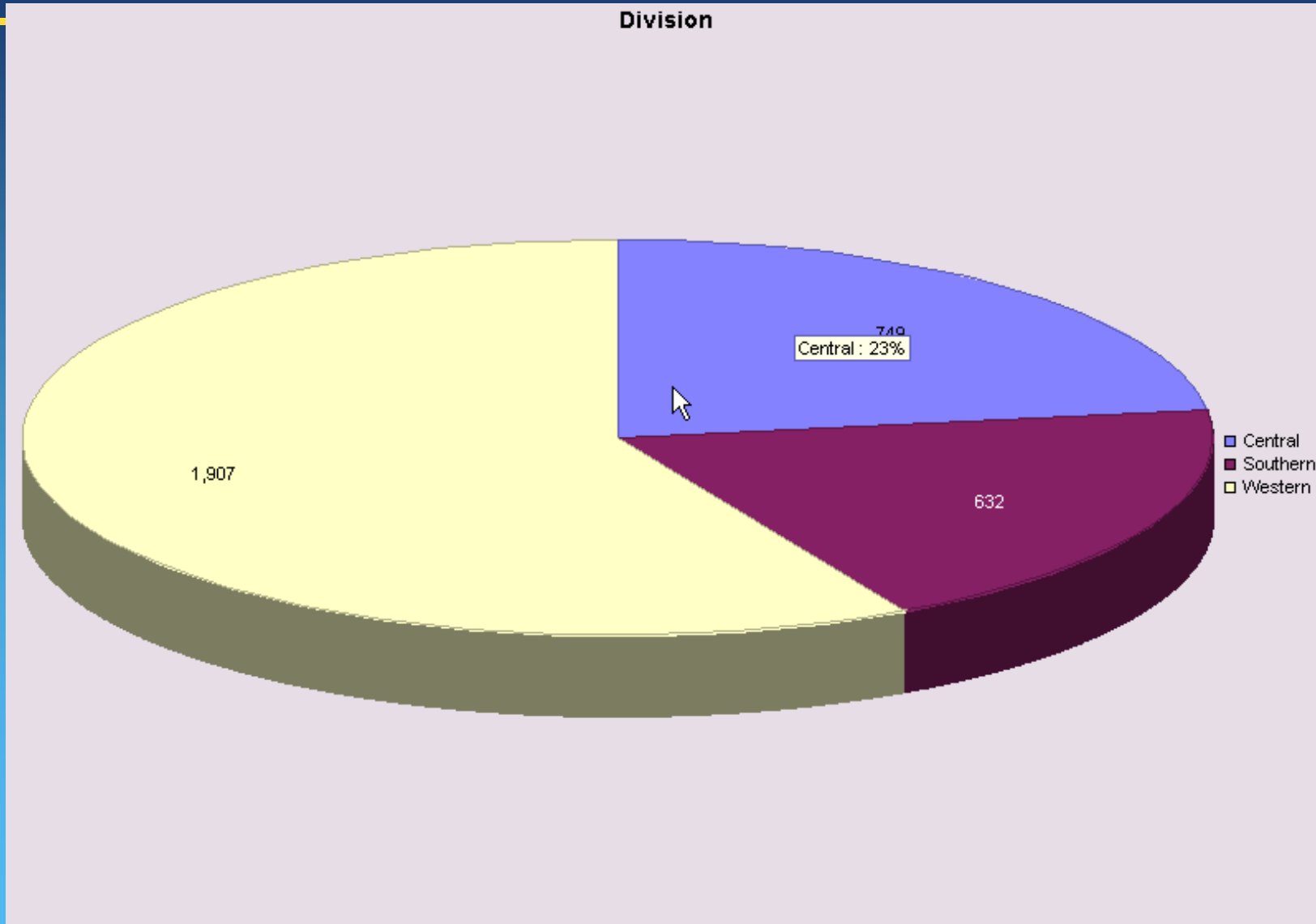
[+ Graphs](#)

[+ Summary](#)

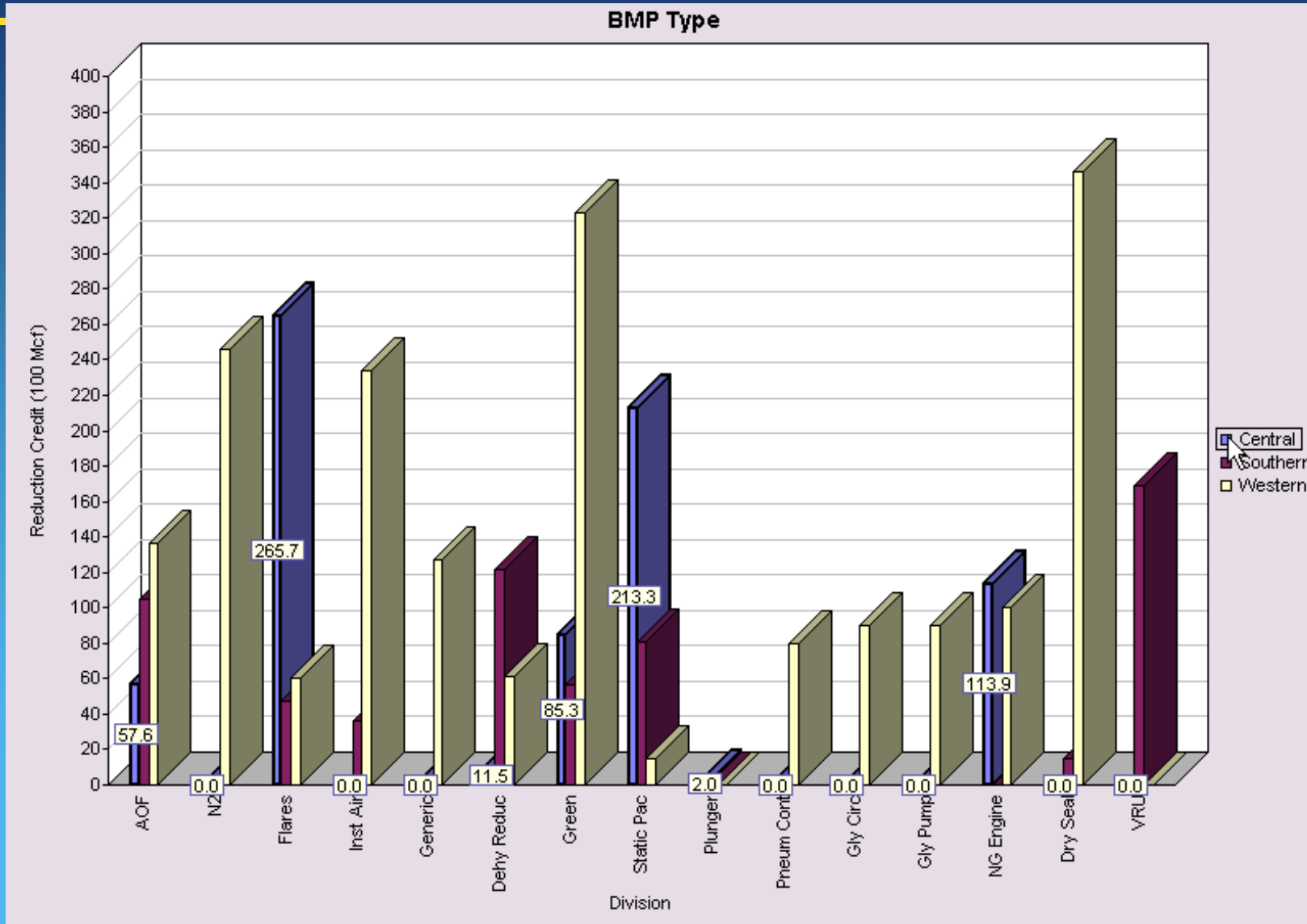
Reporting



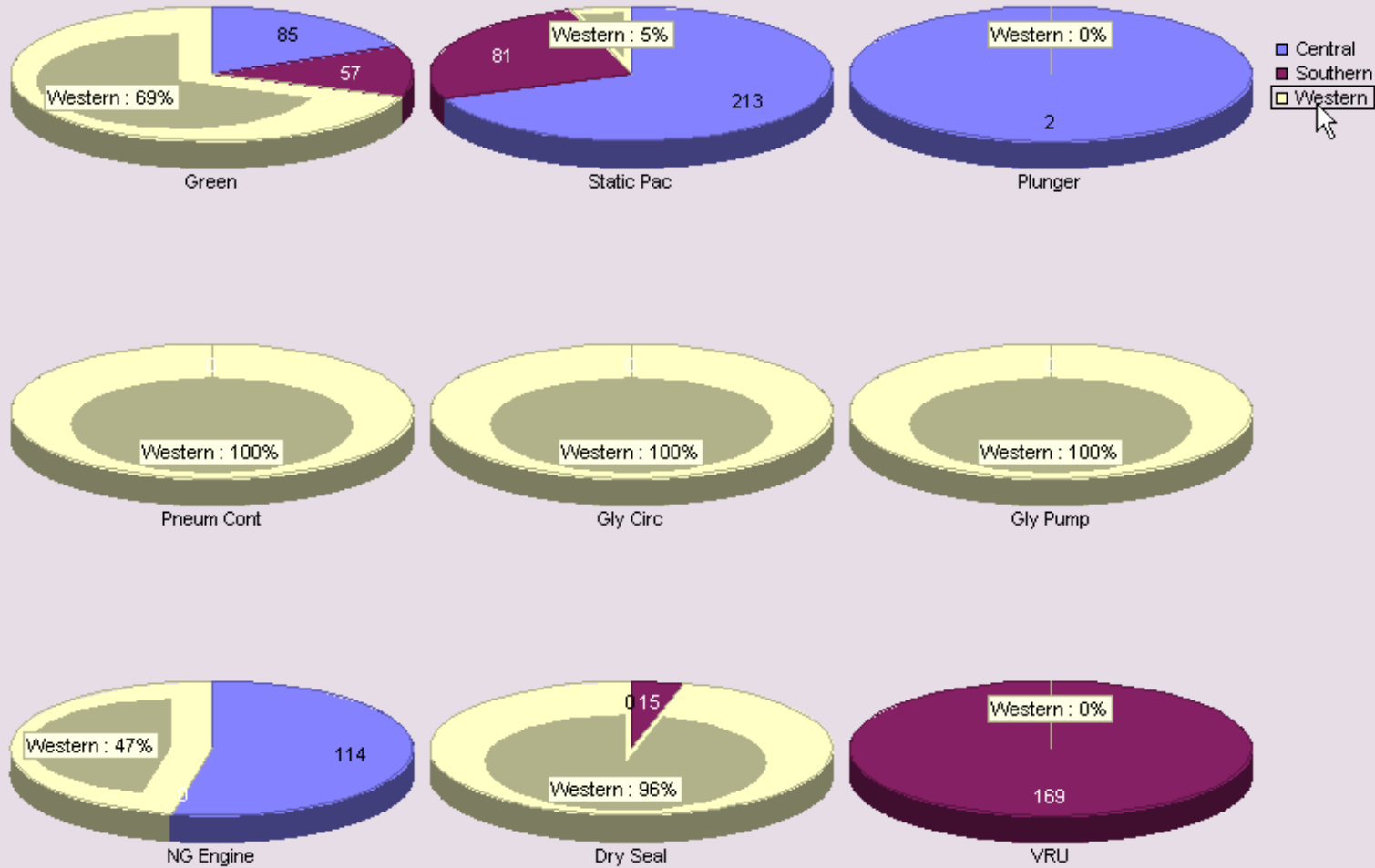
Reporting



Reporting



Reporting



Reporting



Date Range: [] to []

Graphs

Summary

Division	BMP Type	Mcf Credit
Central	AOF Test	57.56
	Convert Engine Starting to N2	0.00
	Flares	265.69
	Gas Controls to Instrument Air	0.00
	Generic Reduction	0.00
	Glycol Dehy Reductions	11.52
	Green Completions	85.33
	Install Static Pacs at Compressor Station	213.34
	Plunger Lift	2.02
	Pneumatic Controllers	0.00
	Reduce Gly Circ Rate	0.00
	Replace Gas with Electric Gly Pump	0.00
	Replace NG Engine with Electric Motor	113.92
	Replace Wet Seals with Dry Seals	0.00
	VRU	0.00
	DIVISION TOTAL:	749.38
Southern	AOF Test	105.27
	Convert Engine Starting to N2	0.00
	Flares	47.17
	Gas Controls to Instrument Air	36.06
	Generic Reduction	0.00
	Glycol Dehy Reductions	121.73
	Green Completions	56.77
	Install Static Pacs at Compressor Station	81.01
	Plunger Lift	0.00
	Pneumatic Controllers	0.00
	Reduce Gly Circ Rate	0.00
	Replace Gas with Electric Gly Pump	0.00
	Replace NG Engine with Electric Motor	0.00
	Replace Wet Seals with Dry Seals	15.10
	VRU	169.25
	DIVISION TOTAL:	632.36
Western	AOF Test	135.96
	Convert Engine Starting to N2	246.18

Division
Summary

Division/Field
Summary

Date Range: [] to []

Graphs

Summary

Division	Field	BMP Type	Mcf Credit
Central	FWB	AOF Test	57.56
		Convert Engine Starting to N2	0.00
		Flares	265.69
		Gas Controls to Instrument Air	0.00
		Generic Reduction	0.00
		Glycol Dehy Reductions	11.52
		Green Completions	85.33
		Install Static Pacs at Compressor Station	213.34
		Plunger Lift	2.02
		Pneumatic Controllers	0.00
		Reduce Gly Circ Rate	0.00
		Replace Gas with Electric Gly Pump	0.00
		Replace NG Engine with Electric Motor	113.92
		Replace Wet Seals with Dry Seals	0.00
		VRU	0.00
		FIELD TOTAL:	749.38
		DIVISION TOTAL:	749.38
Southern	Cartilage	AOF Test	0.00
		Convert Engine Starting to N2	0.00
		Flares	0.00
		Gas Controls to Instrument Air	0.00
		Generic Reduction	0.00
		Glycol Dehy Reductions	0.00
		Green Completions	0.00
		Install Static Pacs at Compressor Station	0.00
		Plunger Lift	0.00
		Pneumatic Controllers	0.00
		Reduce Gly Circ Rate	0.00
		Replace Gas with Electric Gly Pump	0.00
		Replace NG Engine with Electric Motor	0.00
		Replace Wet Seals with Dry Seals	0.00
		VRU	0.00
		FIELD TOTAL:	0.00
		DIVISION TOTAL:	0.00
Groesbeck		AOF Test	0.00

VRU	0.00
DIVISION TOTAL:	1907.16
GRAND TOTAL:	3288.90

VRU	0.00
FIELD TOTAL:	0.00
DIVISION TOTAL:	1293.46
GRAND TOTAL:	2675.20

Conclusions

- ★ Free to industry through EPA
- ★ Easy to use web based management tool
- ★ Track methane reductions for STAR
- ★ Manage Users, BMPs and Facilities
- ★ Generate management and EPA reports



Contact Info



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