

Offshore Drilling & Construction

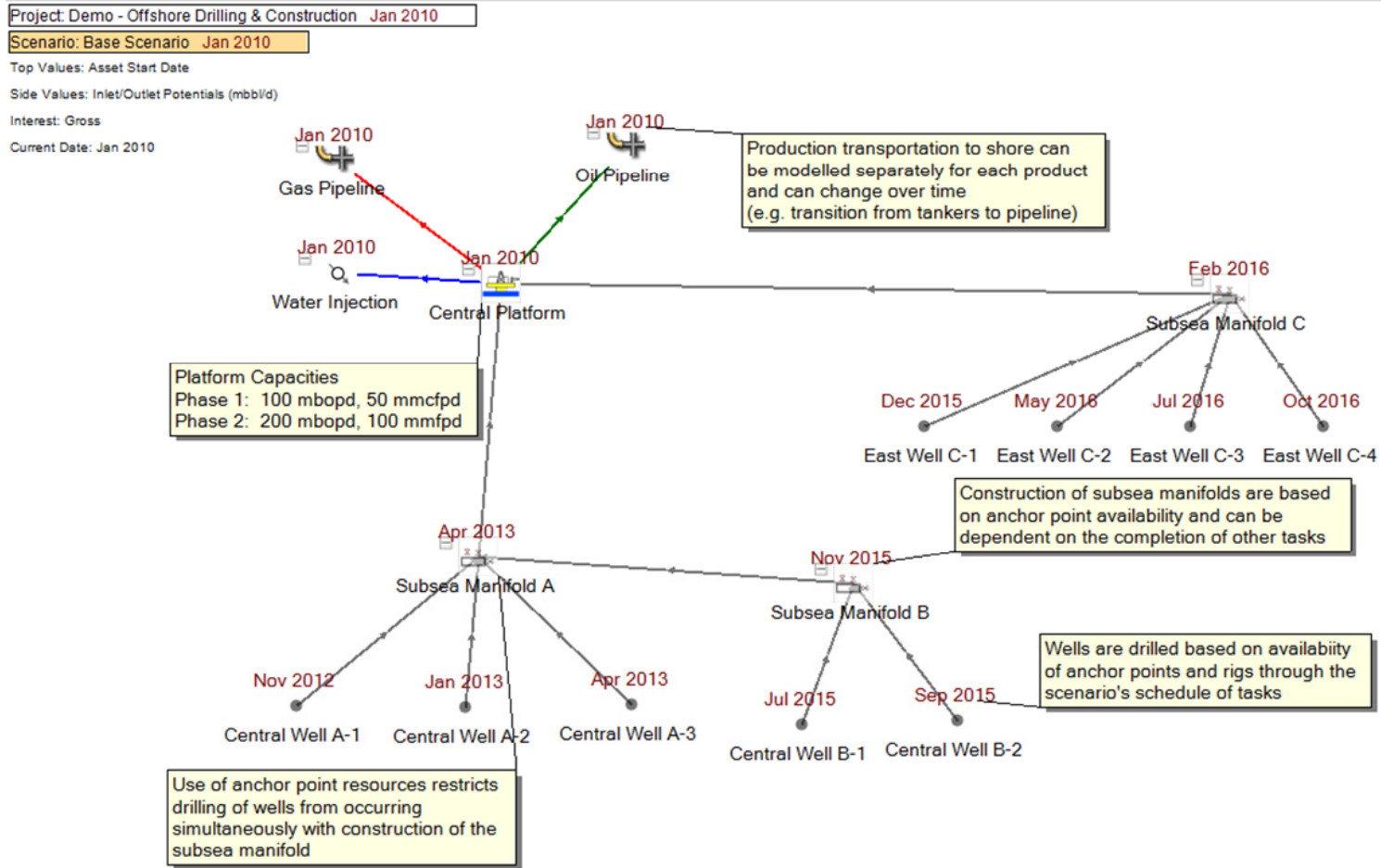
Problem

- Platform construction and drilling of multiple locations

Challenges

- Construction scheduling of dependent tasks
- Maximize utilization of semi-submersible rigs
- Anchor point limitation for vessels

Flow Diagram – Offshore Drilling & Construction



A schematic of the production network is created and the scheduler is used to manage construction timelines, capacities, capital and drilling schedules.

A development plan is created using a series of construction tasks and drilling tasks

Task Editor | Resources | Gantt Chart

Task List ([expand all](#))

- Project Start
 - Platform Phase 1
 - Drilling Program A
 - Gas Pipeline Construction
 - Manifold A - Construction
 - Platform Phase 2
 - Drilling Program B
 - Drilling Program C
 - Manifold B - Construction
 - Manifold C - Construction

General | Phases(1) | Conditions(1)

Construction Task: Platform Phase 2

Name: Platform Phase 2

Is Active: Start Trigger Function: []

Construction Start Date (mm/dd/yyyy): 01/01/2010 []

Timeline Color: Maroon [v]

Create New Facility:

Target Existing Facility: Central Platform [v]

Manage Facility Start Date:

New Constraints Should: Replace Be Added To

Capacity at Completion:	Activate Constraint?
Oil (m bbl/d): 125.00 [fn]	<input checked="" type="checkbox"/>
Gas (mmcf/d): 50.00 [fn]	<input checked="" type="checkbox"/>
Water (m bbl/d): 0 [fn]	<input type="checkbox"/>
Fluid (m bbl/d): 0 [fn]	<input type="checkbox"/>
Sulfur (ton(us)/d): 0 [fn]	<input type="checkbox"/>
Injection Water (m bbl/d): 0 [fn]	<input type="checkbox"/>

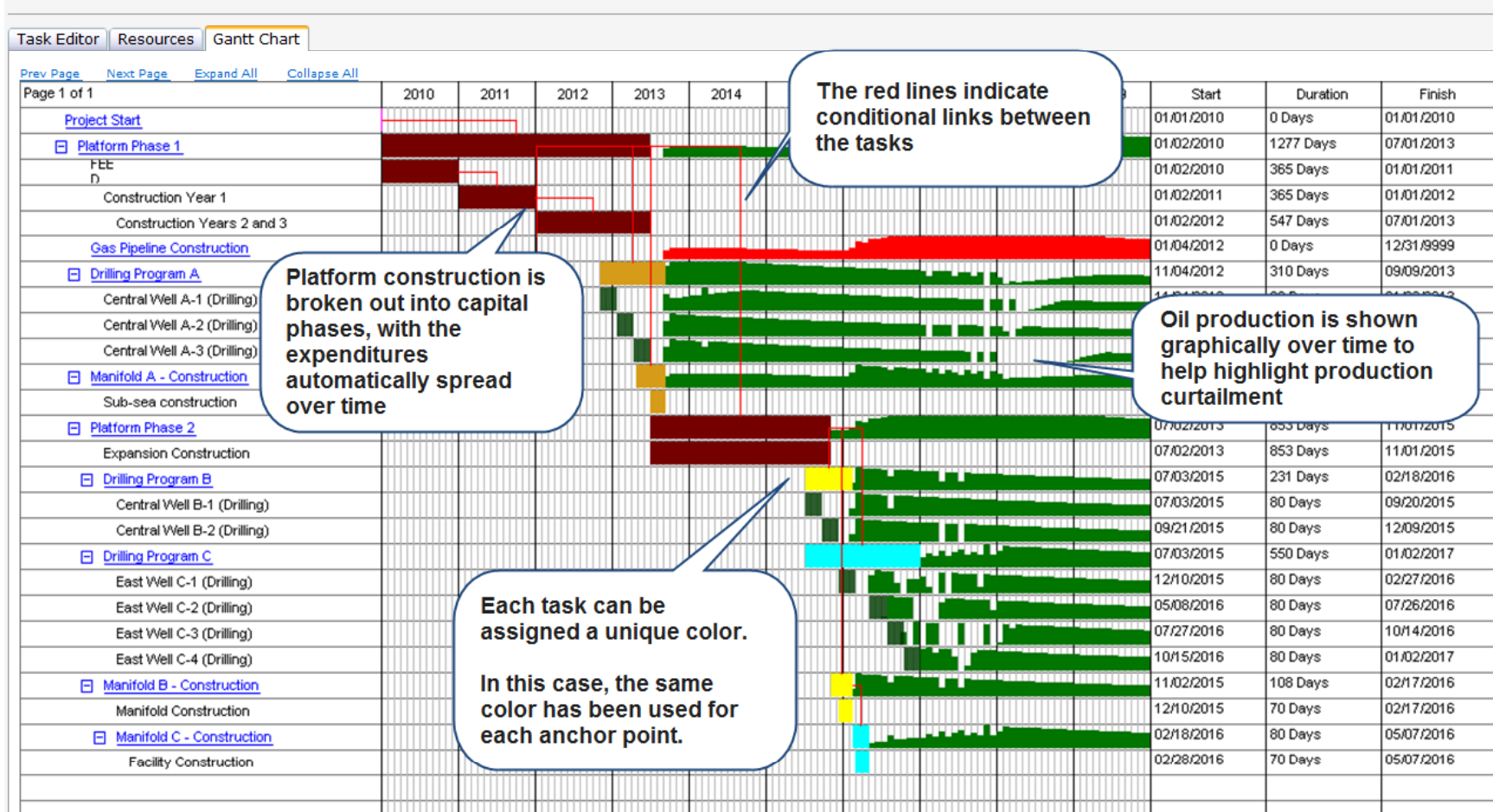
Capital phases can be assigned to each task and require an available resource, such as a construction vessel

A development plan is created as a series of construction and drilling tasks.

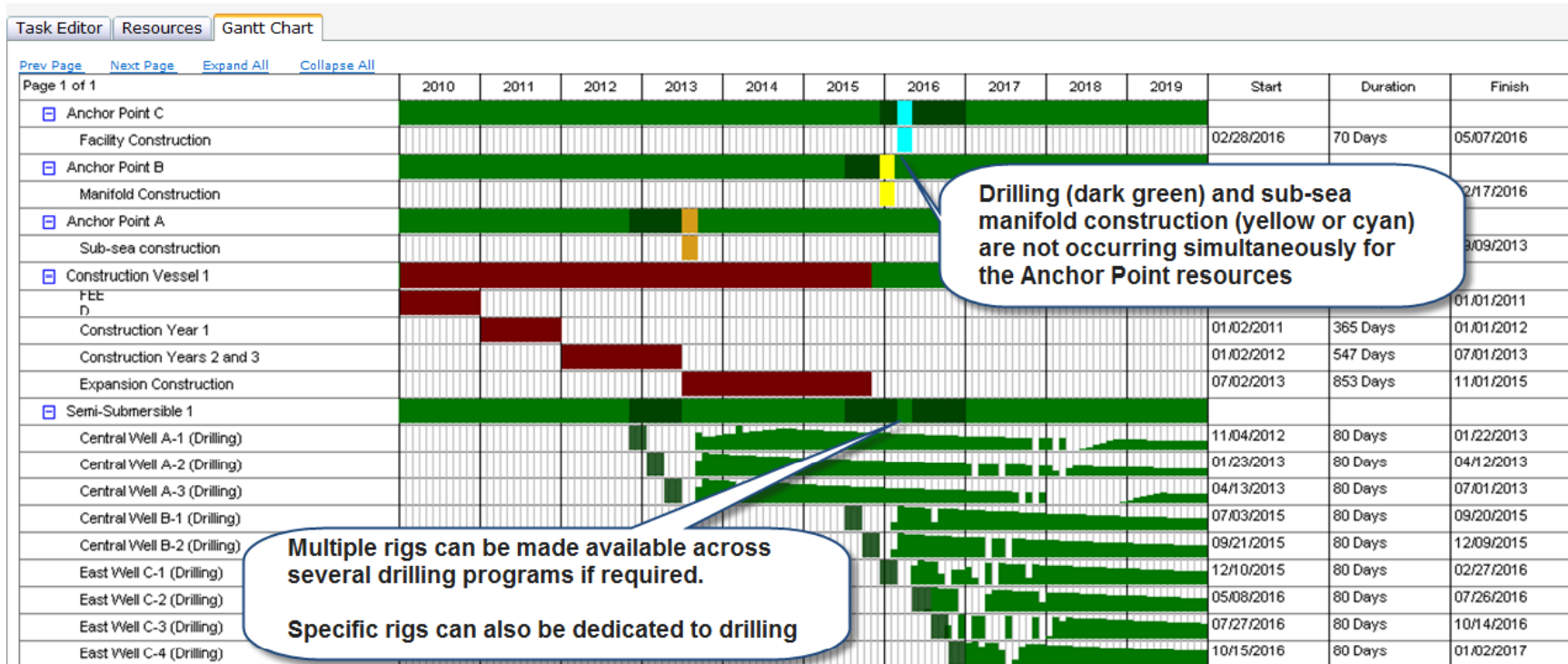
The start or finish of these tasks can be made conditional on the start or finish of other tasks in the plan.

Production capacities are can be brought on incrementally over time.

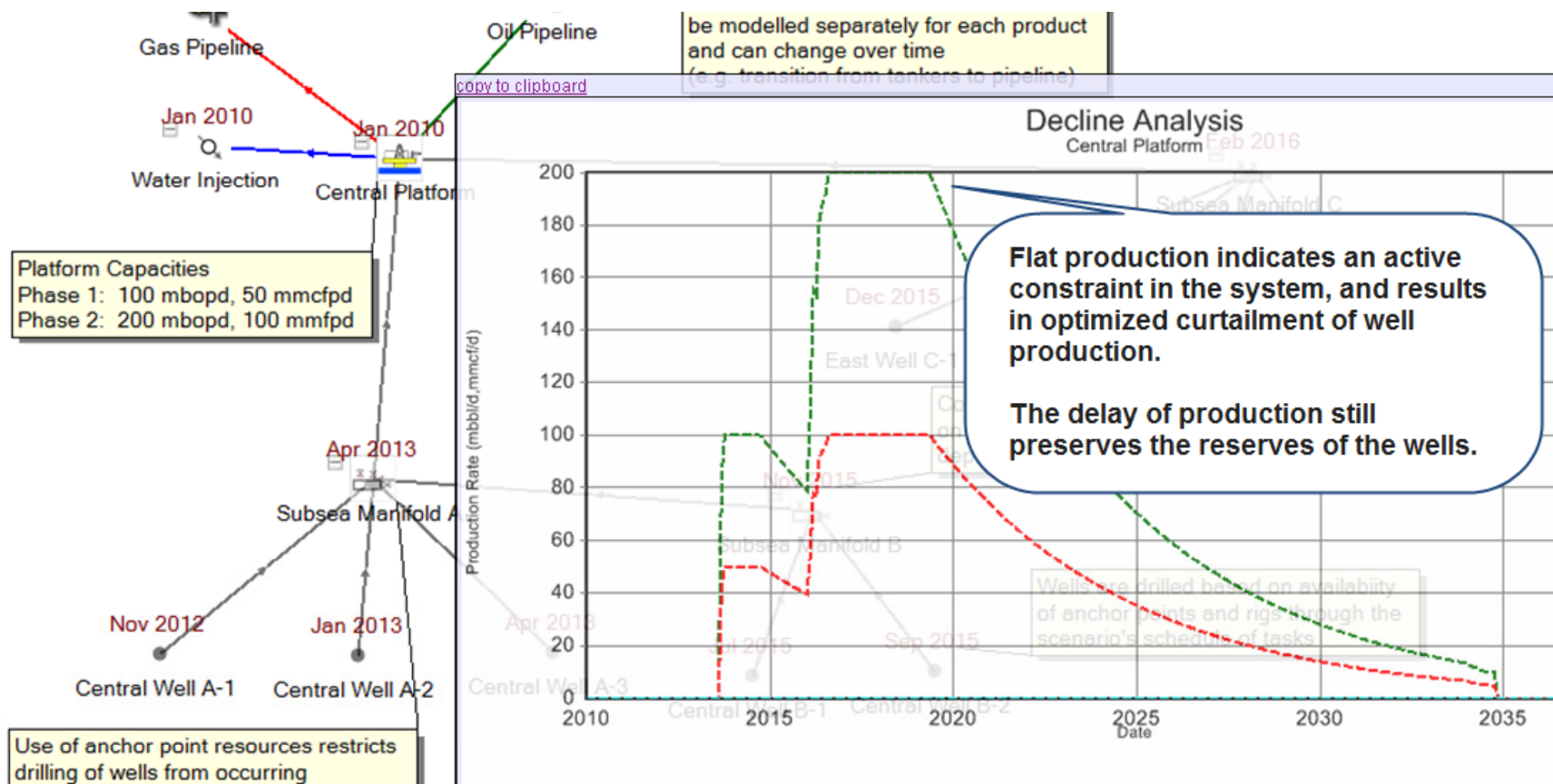
Scheduled tasks for the development scenario are presented in a GANTT chart



The GANTT schedule can present resource utilization of the semi-submersible rigs, construction vessels and anchor points



The platform's production forecast shows the impact of the capacity expansions and drilling programs



Change Drilling Program to be “Drill to Fill”

- Drill to fill monitors volumes through a network node a controls drilling program well start dates.

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	2010	2011	2012	2013	Start	Duration	Finish	Rig Name	Gas Reserves
<input checked="" type="checkbox"/> HBP Drilling Program	[Gantt bars]				01/01/2010	147 Days	05/27/2010		
<input checked="" type="checkbox"/> Drill to Fill - Gas Sales	[Red bar]				05/28/2010	3172 Days	02/01/2019		166,578.4 mmcf
<input checked="" type="checkbox"/> Pad A Well-001 (Drilling)					05/28/2010	25 Days	06/21/2010	Precision Rig A	2,333.6 mmcf
<input checked="" type="checkbox"/> Pad A Well-002 (Drilling)					06/22/2010	25 Days	07/16/2010	Precision Rig A	2,331.7 mmcf
<input checked="" type="checkbox"/> Pad A Well-003 (Drilling)					07/17/2010	25 Days	08/10/2010	Precision Rig A	2,329.7 mmcf
<input checked="" type="checkbox"/> Pad A Well-004 (Drilling)					08/11/2010	25 Days	09/04/2010	Precision Rig A	2,327.7 mmcf
<input checked="" type="checkbox"/> Pad A Well-005 (Drilling)					09/05/2010	25 Days	09/29/2010	Precision Rig A	2,325.6 mmcf
<input checked="" type="checkbox"/> Pad B Well-001 (Drilling)					09/30/2010	25 Days	10/24/2010	Precision Rig A	2,323.4 mmcf
<input checked="" type="checkbox"/> Pad B Well-002 (Drilling)							11/18/2010	Precision Rig A	2,321.2 mmcf
<input checked="" type="checkbox"/> Pad B Well-003 (Drilling)							12/13/2010	Precision Rig A	2,319.0 mmcf
<input checked="" type="checkbox"/> Pad B Well-004 (Drilling)							01/07/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad C Well-001 (Drilling)							01/24/2011	Precision Rig B	
<input checked="" type="checkbox"/> Pad B Well-005 (Drilling)					01/25/2011	25 Days	02/01/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad C Well-002 (Drilling)					01/25/2011	24 Days	02/17/2011	Precision Rig B	
<input checked="" type="checkbox"/> Pad C Well-003 (Drilling)					04/01/2011	24 Days	04/24/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad C Well-004 (Drilling)					04/01/2011	24 Days	04/24/2011	Precision Rig B	
<input checked="" type="checkbox"/> Pad C Well-005 (Drilling)					07/01/2011	24 Days	07/24/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-001 (Drilling)					07/25/2011	24 Days	08/17/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-002 (Drilling)					08/18/2011	24 Days	09/10/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-003 (Drilling)					11/01/2011	24 Days	11/24/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-004 (Drilling)					11/25/2011	24 Days	12/18/2011	Precision Rig A	
<input checked="" type="checkbox"/> Pad D Well-005 (Drilling)					12/19/2011	24 Days	01/11/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad E Well-001 (Drilling)					04/01/2012	25 Days	04/25/2012	Precision Rig B	
<input checked="" type="checkbox"/> Pad G Well-001 (Drilling)					04/01/2012	24 Days	04/24/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-002 (Drilling)					04/25/2012	24 Days	05/18/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-003 (Drilling)					08/01/2012	24 Days	08/24/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-004 (Drilling)					08/25/2012	24 Days	09/17/2012	Precision Rig A	
<input checked="" type="checkbox"/> Pad G Well-005 (Drilling)					12/01/2012	24 Days	12/24/2012	Precision Rig A	

Drilling Program Slowed as Facility Reaches Capacity

Fill Facility Task: Drill to Fill - Gas Sales [delete](#)

Name :

Is Active : Start Trigger Function: *fn*

Start Date (mm/dd/yyyy):

Timeline Color :

Use Production Potential Use Actual Production

Facility :

Facility Capacity Trigger (%) : *fn*

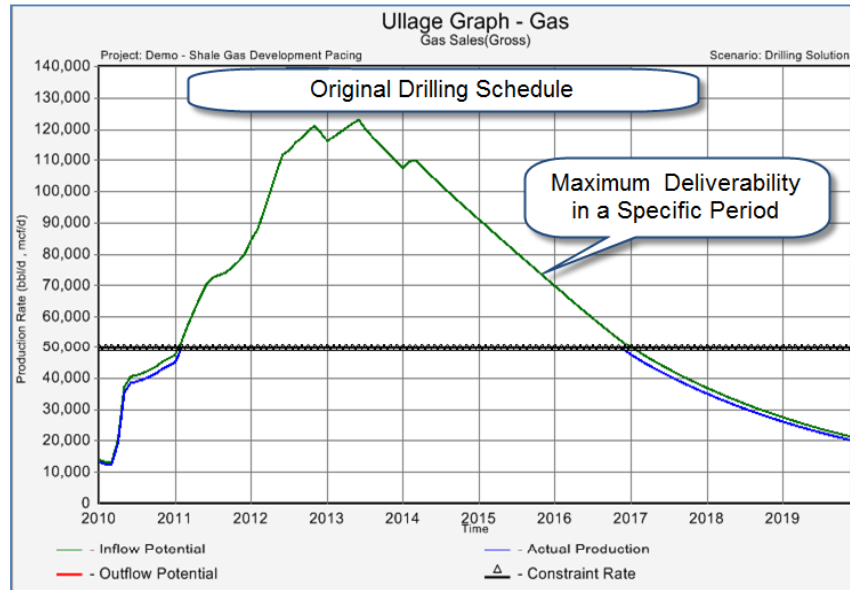
Maximum Refill Target (%) : *fn*

Facility Triggers Based On all Products

Select Asset Node

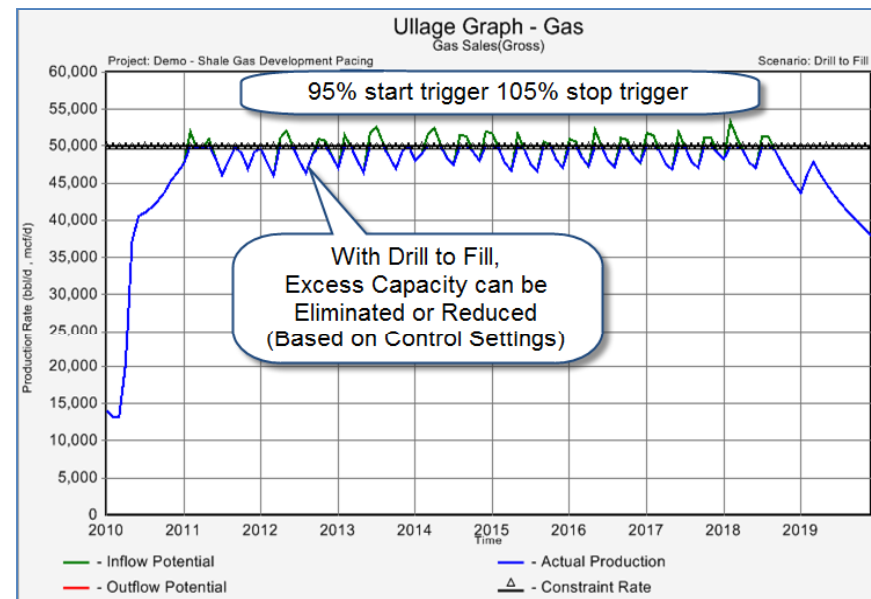
Set trigger points

Results – New program avoids over capacity

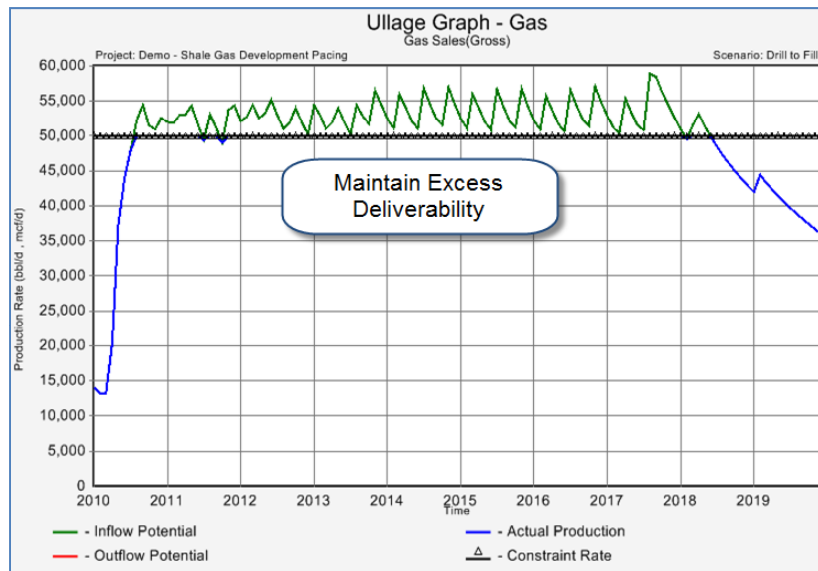


Drill to Fill Controls the Drilling Schedule while honoring all resource rules, including:

- Access Restrictions
- Rig Availability Timing
- Frac Timing
- Gathering system construction



Results – Drill to Fill program can be Tuned



- Drill to Fill can be tuned to eliminate All Over capacity, or under capacity as needed

