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# Advisor

## **Reducing DUC Days**

OPTIMIZED SOLUTION TO REDUCING UNCOMPLETED WELL DAYS ON MULTI-  
WELL PADS

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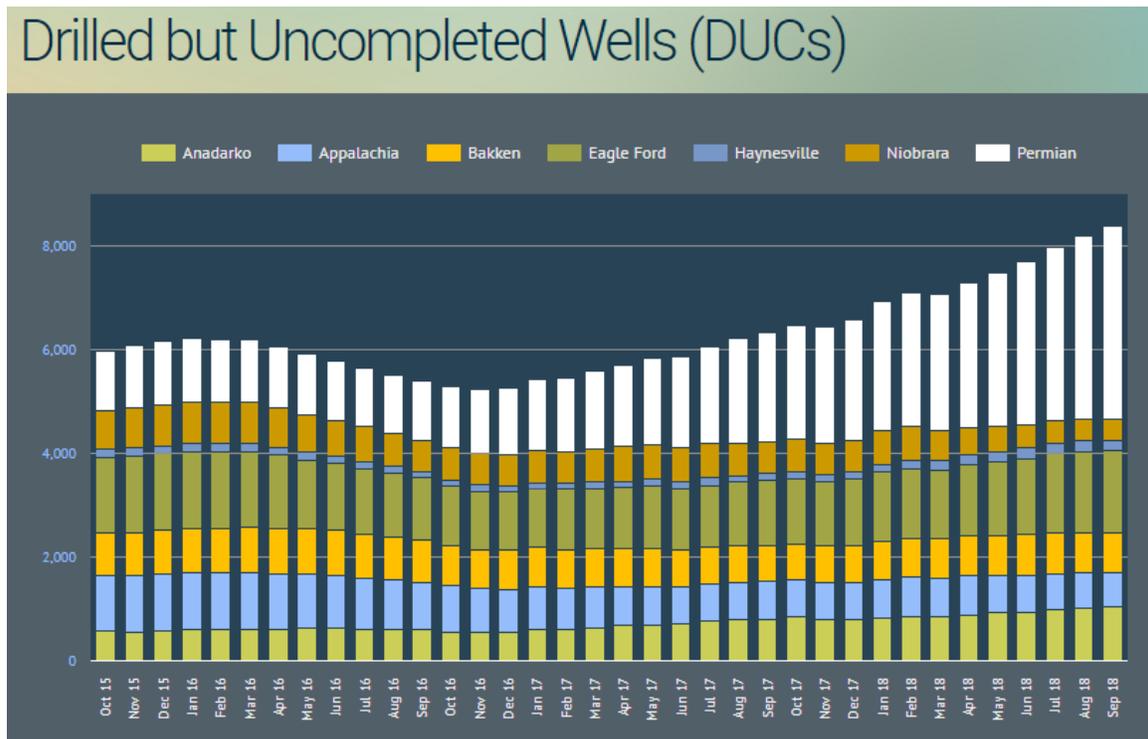
## Background

Multiwell pad unconventional drilling activity is becoming common practice in the oil & gas industry; however, gone is the simple notion that it's merely skidding a rig over a few feet and drilling another lateral. The war game scenario goes beyond the traditional technical application and rules of thumb and delves into the balance of understanding productivity and efficiency as it pertains to completions and production.

The issues may vary from one play to another, but the challenges of reducing cost, enhancing productivity and improving recovery rates remain the ultimate goals of pad drilling, regardless of the particular horizontal play.

Multi-well pads, batch drilling and zipper fracturing have improved the oil recovery of a well; however, has impacted the start of production substantially. These wells in waiting are considered drilled yet uncompleted or DUCs.

According to the EIA, a DUC is defined as a new well after the end of the drilling process, but its first completion process has not been concluded. For the purpose of EIA's estimates, the end of the drilling process is estimated to be 20 days after drilling has commenced.



## Issue

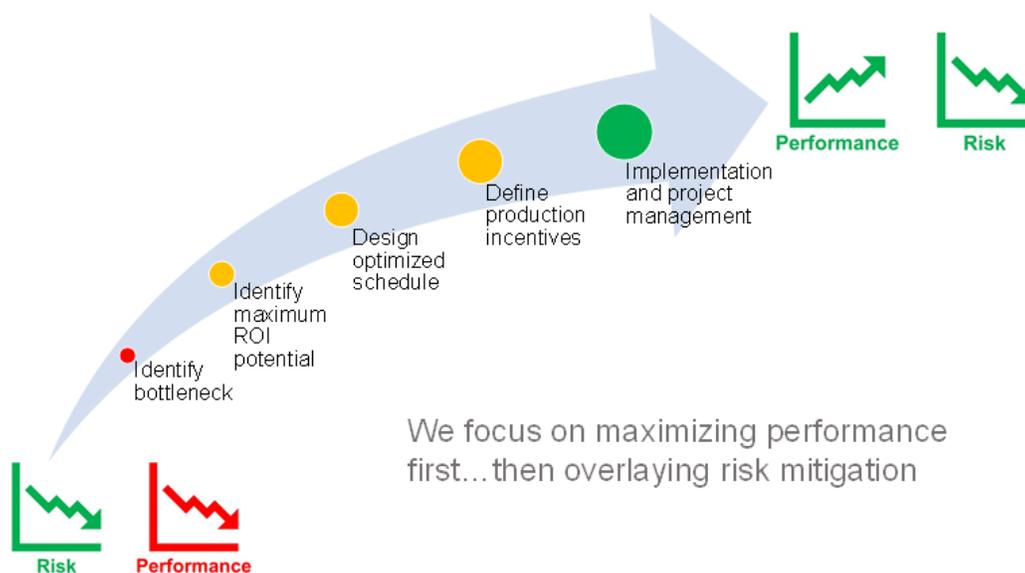
There are several widely acknowledged drivers behind the rise in DUC counts:

- Spatial constraints between drilling and fracking operations which are inherent with multi-well pads
- Water Resource and pit size and refill rate
- Completion crew shortages and contractual obligation for continued use
- Capital expenditure constraints
- Drilling-to-hold leases
- Cube developments that involve drilling 20 or more wells at once before bringing them on line
- Production management vs Portfolio risk management

Most industry metrics track efficiency when a crew is on a well; drilling/completion days on a well. Our focus is measuring and finding ways to reduce the days between activities. While many operators share drilling and completion days, they rarely share DUC days and inventory backlog. From our research we have found that non-productive days on a well could be as much as 100+ days per well; not including the time it takes to drill and complete the well.

## PSM Approach

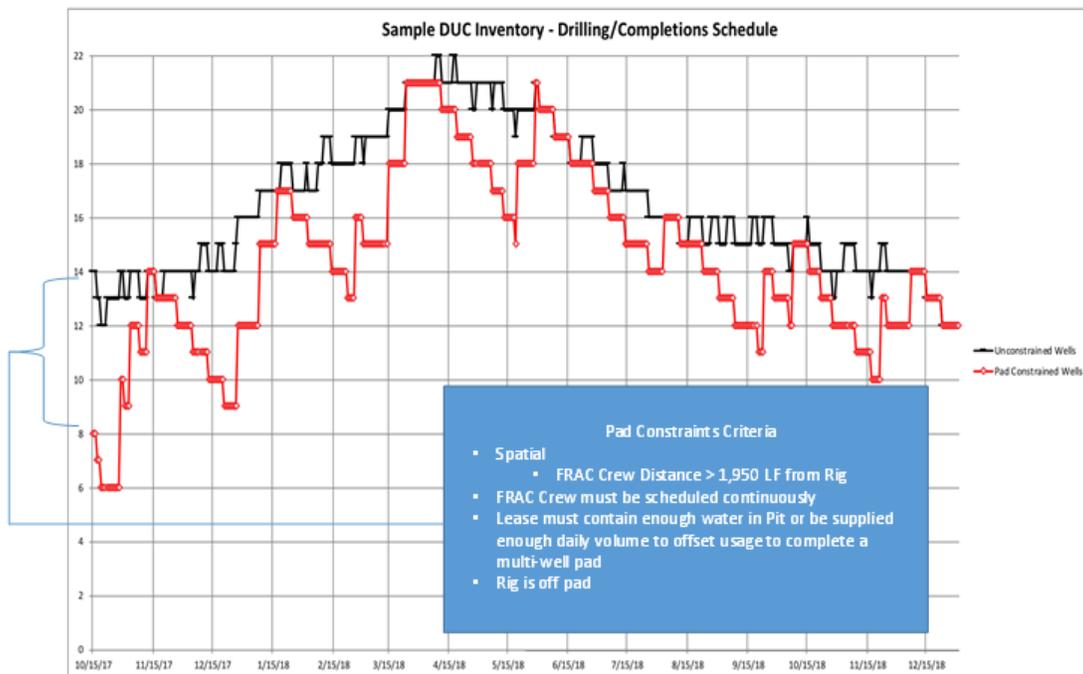
Aligning incentives is our primary focus and we identify the operational bottlenecks on a portfolio level. Most of the efficiencies can be gained by integrating key inter-departmental processes; specifically the production and operations teams.



We systematically identify the constraints which hinder well completion and identify where the bottlenecks occur. Once we identify the bottlenecks we work with company stakeholders to identify the most critical and impactful solutions for reducing the DUC inventory.

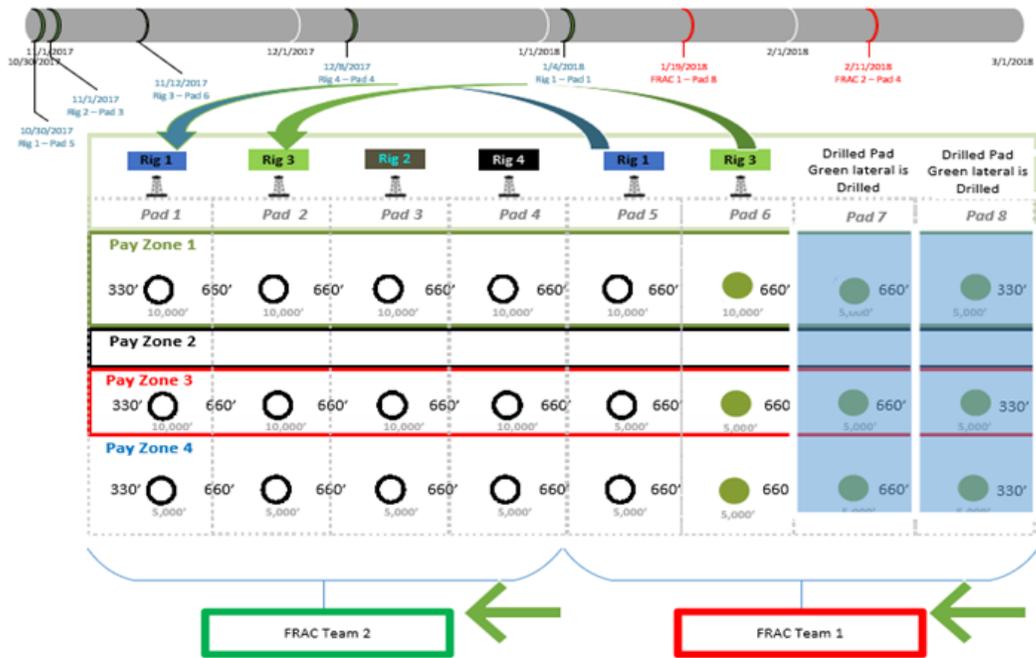
## Solution

Understanding that as long as drilling operations are ongoing their will always be a DUC inventory. Identifying the inventory and tracking the amount of DUCs over the portfolio schedule is crucial in understanding how best to tackle the problem.



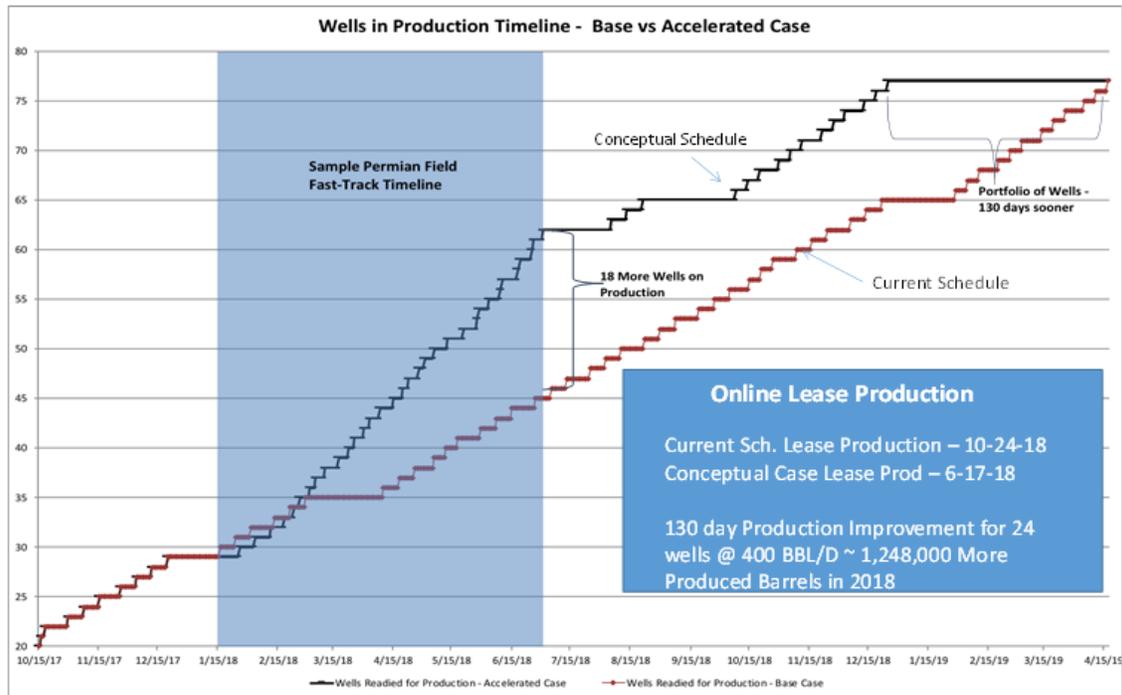
The above plot shows a sample DUC inventory over the course of an entire project duration. The black line represents the entire DUC inventory at that given time and the red line takes into account the contractual obligation that completion crews operate without any downtime.

Spatial bottlenecks can be addressed by optimizing the coordination of both the rig and the completions crew simultaneously within a given field. Mindfully orchestrating the positioning of both discrete events around a given field can dramatically reduce DUC days. Below is an example of how a bottleneck can be optimized utilizing only existing resources originally available under a project.



## Results

The identification of the bottleneck and appropriately addressing how best to position the events can drastically improve DUC inventory as shown below.



**Key Highlights**

- Production was reduced by 130 days
- Company was able to produce an additional 1.2M barrels within the production year

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Jean-Francois leads PSM Advisor’s Workflow Optimization practice and brings 18 years of integrating disparate accounting/procurement systems for the Oil & Gas and Defense Government Contracting sectors.

Jean-Francois has US and EMEA experience delivering value to such companies as Hunt Oil, DynCorp International, Agility, and Halliburton

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