

# A Major Operator in South America

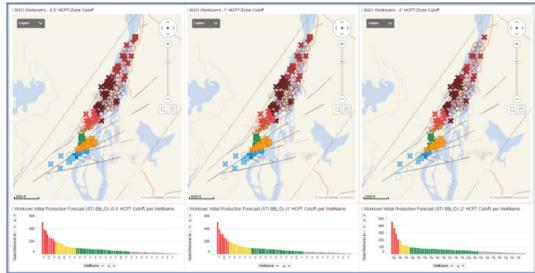
## Using Automated ML and AI to Reduce Catalog Update Workflow by Over 90% in a Mature Field

### Executive Summary

The asset is a mature field with over 70 years of production history from 200 wells (mainly vertical well development). After a long period of primary production, waterflood began over the past ten years.

#### Field – Key Statistics:

- 200+ Wells
- 18 Reservoir Zones
- 70 Years Production
- 10 Years of Waterflood



SRO workovers show locations of recompletions and reactivations identified using low or optimistic cutoff case (left), mid case (center), and high or conservative case (right). Identified opportunities could add 4,600 BBL/D to daily production in the low case, up to 7,000 BBL/D in the high case.

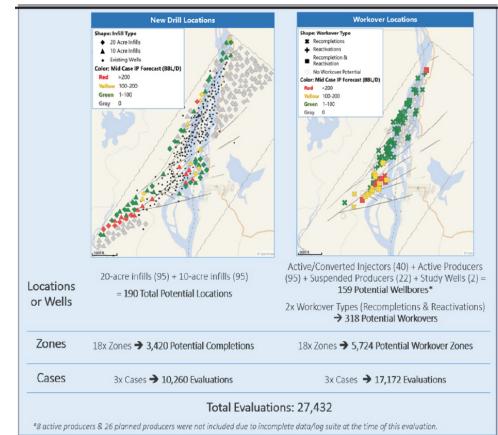
### The Challenge

- The asset was a mature field with a long history of mainly vertical well development and with some recent waterflood, producing from a Tertiary fluvio-deltaic to alluvial siliciclastic reservoir in a faulted anticlinal trap with low resistivity pay. This provided challenges with regards to understanding compartmentalization and delineation of both original and current remaining oil.
- There was a need to identify new recompletion and infill drilling opportunities that align with overall reservoir management strategy, satisfy both geological and engineering constraints, provide reliable forecasts, and are mechanically viable.

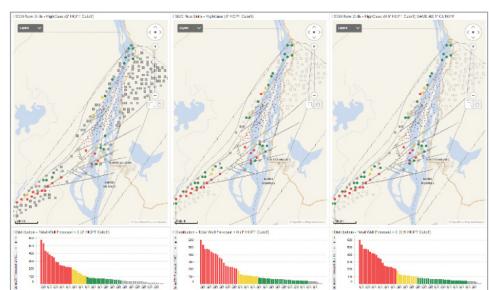
### Why choose AWS for your machine learning needs?

With high-performance computational options powered by machine learning, Amazon Web Services (AWS) enables organizations to undergo broad digital transformations with modern, cloud-native solutions. Offering a broad set of machine learning services and supporting cloud infrastructure, AWS enables organizations to tailor their machine learning solutions to meet the unique needs of their business.

Organizations are already realizing great value from AWS, enabling them to provide new experiences for their customers and drive business growth. Improved processes, increased efficiency, and accelerated innovation are just some of the benefits realized from the inclusion of machine learning in business operations.



Summary of the number of opportunity evaluations completed for this project for new drills (left) and recompletions (right). Separate cases were run using mid, high, and low cutoffs to give the asset team a range of scenarios.



All evaluated locations for potential vertical new drills from the conservative (left), mid (center), and optimistic case (right). Up to 72 identified locations could add 7,000 BBL/D to daily production in the low case, and up to 9,900 BBL/D in the high case.

## Why QRI and SpeedWise® Reservoir Opportunity

Effective reservoir management requires combining multiple engineering/geoscience disciplines to identify improvement opportunities. To optimize analysis, QRI, a leading Artificial Intelligence solutions provider, developed an AI-powered management platform that delivers faster, more accurate results to maximize asset value.

SpeedWise® Reservoir Opportunity\* (SRO) is an AI-powered, cloud-native platform that applies advanced computational algorithms and data mining techniques on multi-disciplinary datasets to automatically identify a ranked list of remaining field development opportunities. These opportunities include recompletion behind-pipe, reactivation, vertical new drill locations, sidetrack options, and deviated/horizontal targets.

“ I was impressed by the quality of the work, as they analyzed a large amount of data in a very short time period. SRO is a good methodology for giving you more details of the field, that could have been overlooked using other software. ”

Senior Asset Geologist

## The Solution

SpeedWise Reservoir Opportunity was leveraged by the asset team with the aim of increasing the speed and accuracy of results. To account for uncertainty in the geomodel, low, mid and high case static models were used to frame a range of potential outcomes. More than 10,000 recompletion candidates were screened and evaluated. Over 17,000 vertical well candidates were evaluated based on the geo-engineering constraints. Fifteen different cases were run (5 varied settings/insight \* 3 different static models) to better quantify the downside risk and upside potential.

\*US Patent Pending

## Results and Benefits

In only six weeks, SRO identified an extensive opportunity inventory to increase oil production.

- Recompletions & Reactivations: Identified opportunities could increase oil production 4,600 - 7,000 BBL/D
- Vertical New Drills: Up to 72 sweet spot targets that could increase oil production 7,700 to 9,900 BBL/D.

## Benefits

Significant efficiency gains were made in the existing workflow for updating the opportunity catalog, resulting in more than a 90% reduction in time and cost. At the same time, the move from deterministic models to probabilistic models offered a more robust tool for decision making.

	Previous Workflow	SRO
Completion Time	6 months	6 weeks
Person Months Spent	24 months	8 weeks
# of Scenarios	1 case	15 cases