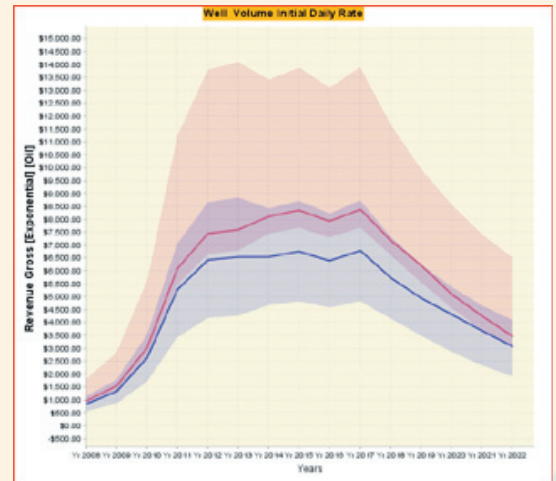


Petranomics™ New Wells Planner

Reservoir engineers, asset engineers and operational/financial managers want high quality, fast and flexible economic tools to plan and analyze their investments and expenses, to assess pricing or project changes to budgets, and to provide economic scenario comparisons for project and operational decisions.

The Petranomics New Wells Planner addresses this need with a powerful economic analysis solution for planning and managing new well/field exploration and production (E&P) projects and plans. Economic E&P plans for new wells can be created then dynamically analyzed and compared as scenarios at each step of the well and reservoir process to determine the right next step, decision or plan revision.

Petranomics is a family of products for economic analysis and modeling of wells and reservoirs throughout the E&P lifecycle. The Petranomics New Wells Planner combines a focused economic model for New Wells E&P and the Petranomics Analyzer tools.



powered by:
Petranomics™ Analyzer

Economic Well and Field Analysis

Impressively improve business decisions each step throughout the well and field E&P process with the New Wells model and Petranomics Analyzer.

Construct and manage initial/ongoing E&P plans by creating and analyzing upside/downside economic scenarios/cases representing multiple projections in well volume, well start timing, oil/gas price, operating expense, salvage, plug/abandonment, product mix, reserves and well success probability.

Economic Scenario Comparison

Model one well or all wells in the field inputting each well's economic assumptions. Construct and analyze what-if comparisons for each operational decision step based on the robust economic model. For instance, construct a series of volume related scenarios exploring different decline curves, well start timing and initial well volumes impact to revenue, expense and NPV cash flow. Then compare and analyze the scenarios with powerful scenario management.

Dynamic Sensitivity Analysis

Explore what-if scenarios dynamically through Petranomics dynamic scenario analysis. With the scenario comparison results, gain the economic insight needed to

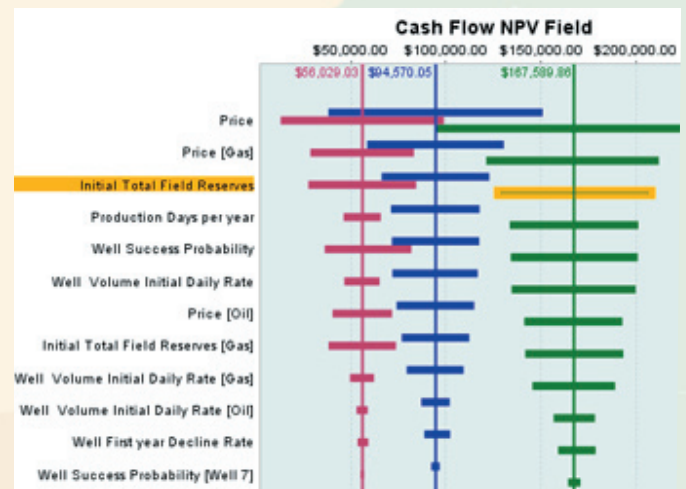


Figure 1 - Field Level NPV Cash Flow Sensitivity Analysis comparing a base case to upside/downside cases.

set the well and filed plan and to make the project and business decisions.

Economic analysis results, as shown in figure 1 – Field Level NPV Cash Flow Sensitivity Analysis, are dynamically calculated and displayed for outcome sensitivity analysis to assumptions providing insight to oil and gas market and operational uncertainties and risks.

The analysis shows assumption impact ranking, what assumption is most important, as well as each

assumption's positive and negative range impact to the outcome, in this case NPV Cash Flow.

Assumptions

Petranomics New Wells Planner models and analyzes a select list of economic assumptions and their uncertainty ranges to calculate outcome sensitivity to the assumptions. Example assumptions included are:

- Geo
 - multi-wells in one field,
 - initial volume,
 - hyperbolic and exponential decline rates,
 - well started year (staggered timing),
 - reservoir reserves for field,
- Investment and Expense
 - investment by well,
 - drilling/completion by well,
 - lease operating expenses by well,
 - water processing from well
 - royalty by well,
 - plug/abandonment expense by well
- Production Variables
 - production capacity limits,
 - minimum economic volume limits / caps,
 - number of production days by well,
 - well success probability factors,
- Market Pricing
 - oil and gas price by time.

The Petranomics New Wells Planner's model allows both course and fine grain economic impact analysis. These assumptions' nominal value as well as their minimum and maximum values can be dynamically ranged to explore economic sensitivity impact from assumption uncertainty.

The assumption management feature, illustrated in



Figure 2 - Assumption Organization and Drilldown

Petranomics™ - Petroleum Economic Analysis Software

Figure 2 - Assumption Organization and Drilldown, provides a highly organized means to define and manage assumptions in the economic model.

Calculation Modules

The **Petranomics New Wells Planner** model contains economic calculation modules for improved model organization, modularity and analysis clarity. The Petranomics for New Wells calculation modules for wells and field include:

- well start and hyperbolic/harmonic and exponential decline,
- production volumes,
- investment,
- revenue,
- salvage,
- expenses,
- tax,
- cash flows (e.g., non-discounted, discounted, NPV, IRR),
- metrics (ROI) and
- reserves.

Outcome:	Cum Cash Flow for Field
Unit:	Dollars \$K
	Value
Yr 2008	-\$938.95
Yr 2009	-\$308.81
Yr 2010	\$1,549.18
Yr 2011	\$6,276.21
Yr 2012	\$9,866.01
Yr 2013	\$14,130.09
Yr 2014	\$19,742.12
Yr 2015	\$24,186.32
Yr 2016	\$29,798.13
Yr 2017	\$33,999.55
Yr 2018	\$37,344.42
Yr 2019	\$39,588.41
Yr 2020	\$41,059.41
Yr 2021	\$42,077.00
Yr 2022	\$45,246.00

These calculation modules allow economic analysis at any level of the Petranomics New Well model.

Dynamic Economic Analysis of Uncertainty Impact

LayeredRock's Petranomics New Wells Planner allows quick evaluation of operating and marketplace assumption uncertainties and risks for each well and the field. Assumption uncertainty impact on well/field revenue, expense and NPV Cash Flow is dynamically analyzed and compared to the base case and your scenarios.

As market, operational assumptions or results change, structure and examine new scenarios to gain economic analysis results to drive decisions and update the E&P plan.

Contact LayeredRock Software to discuss your needs and for a demonstration of Petranomics products or to investigate how LayeredRock's modeling and analysis services can accelerate your project.

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