

# **SPE Workshop:** Resource Estimation, Definition, and Production Forecasting

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# Contingent and Prospective Resources, challenges in SPE PRMS Classification

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*decisions with confidence*

# Abstract



Contingent and Prospective resources cover a vast spectrum of resources and uncertainty.

In situations where discovery is questionable, appraisal is limited and geology is complex, the classification and assignment of Contingent Resources may not be straightforward.

This presentation discusses several situations where the application of the PRMS requires lateral thinking and judgement.

# SPE PRMS Resource Classification

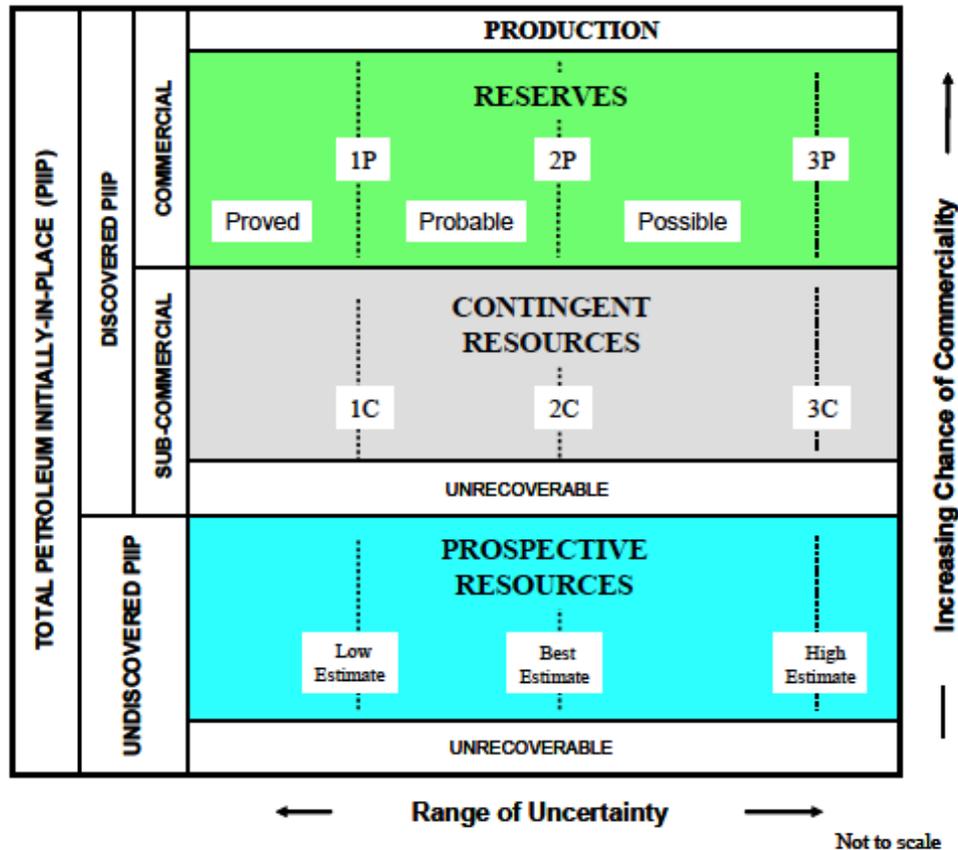


Figure 1-1: Resources Classification Framework.

UNRECOVERABLE is that portion of *Discovered* or Undiscovered Petroleum Initially-in-Place quantities which is estimated, as of a given date, *not to be recoverable* by future development projects. A portion of these quantities may become *recoverable* in the future as commercial circumstances change or technological developments occur.

# Discovered Resources



The difference, is it all in the discovery?

As per the PRMS Section 2.1.1 (prior to 2018 update):

- A discovery is one petroleum accumulation, or several petroleum accumulations collectively, for which one or several exploratory wells have established through testing, sampling, and/or logging the existence of a significant quantity of *“potentially moveable”* hydrocarbons.

What does *“potentially moveable”* actually mean?

2018 PRMS update proposes to replace *“potentially moveable”* with *“potentially recoverable”*.

Is it implying, hydrocarbons are *“potentially recoverable”* under a specified development project?

- That is to recognise a discovery, is a specific development project is required?

# Discovered Resources



Let's dig a little further into the SPE PRMS Appendix A (pre 2018 update), Glossary of Terms Used in Resources Evaluations:

- Appendix A, defines known accumulation as an individual body of **petroleum-in-place**.

The key requirement to consider an accumulation as “known,” and hence containing Reserves or Contingent Resources, is that it must have been discovered:

- Penetrated by a well that has:
  - Established through testing, sampling, or logging the existence of a significant quantity, of recoverable hydrocarbons.

No reference in the above to potentially **“moveable hydrocarbons”**, as per Section 2.1.1, replaced by recoverable hydrocarbons.

Note that the 2018 SPE PRMS update appears to remove this definition and replace with **“An accumulation that has been Discovered”**.

# Discovered Resources

Do you really need a well test, or are there alternatives?



# Case Study – Discovered Resources?



Well penetrated “tight gas” sandstone sequence.

Historic DST had gas to surface but rate too small to measure:

- Targeted sandstone has flowed in other exploration permits in the basin over 20 years ago but these are not proximal, and none of these permits have progressed to development.
- Logs suggest gas.
- Proposed development plan is conceptual at best has yet to be shown to technically feasible in the sandstone sequence in basin and is beyond the technical and commercial capabilities of the client.

Is the field discovered under the PRMS Section 2.1.1 for Contingent Resources to be assigned?

# Case Study – Areal Extent Contingent Resources?



Onshore field mature field, produced associated gas over 80 years ago, client wishes to develop deeper penetrated gas zones:

- Complex geology and limited data set.
- Last 16 years production data from a single well highly uncertain, material balance estimates range from 40 to 400 Bscf GIIP.
- No original data remains from the early development wells and only limited data was acquired in the more modern wells.
- Modern 2D seismic data, but unable to resolve and map individual sand bodies.

Clearly Contingent Resources exist but at what point away from well control (single well) do Contingent Resources cease and Prospective Resources commence?

# Case Study – Areal Extent Contingent Resources?



Approach was to estimate a range of UR from the single well and back calculate drainage areas using average reservoir properties and gas formation volume factor.

Then estimate resources (GIIP) for the whole structure (Contingent and Prospective) using a 1D (Monte Carlo) approach since individual sands could not be mapped.

The Prospective Resources were therefore the difference between the two.

# Case Study – PRMS and Internal Process Alignment?



Client has a Contingent Resource that it has decided to elevate to Reserves, however an FID has not been taken, and under the SPE PRMS a specific FID is not required to assign Reserves.

The client's current internal resource maturation stage gate process articulates that an FID is required before a Contingent Resource can be recategorized, and Reserves assigned.

Since Reserves are assigned on an "entity basis" and the SPE PRMS implies a company needs to meet its own criteria, should this reallocation from Contingent Resources to Reserves be accepted?

# Summary and Conclusions

Rules are for the guidance of the wise and the blind obedience of fools!

Application of the PRMS requires lateral thinking and judgement and must consider the entire context in which the resources are presented.

