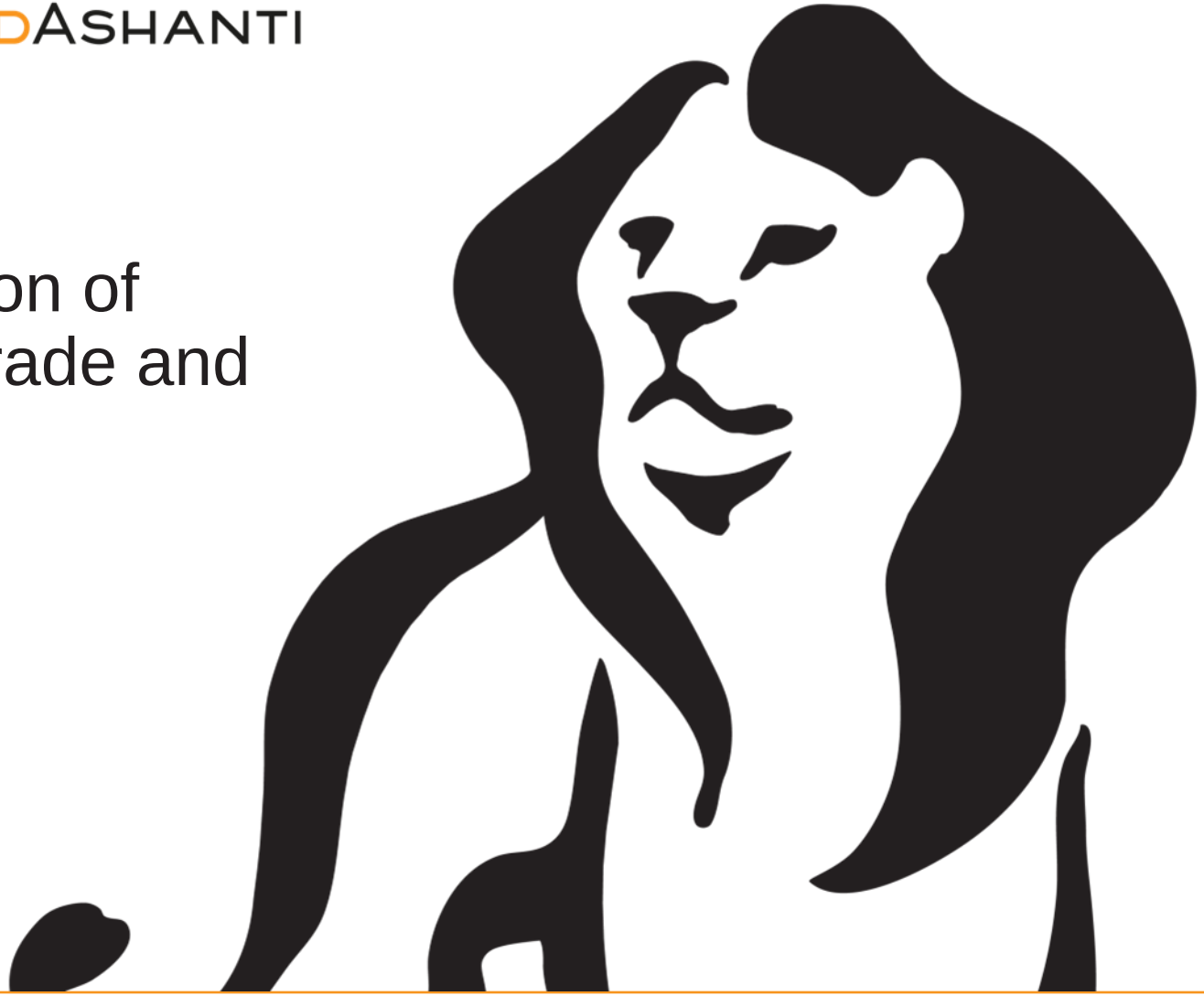
ANGLOGOLDASHANTI

Reconciliation of produced grade and tonnage



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VAUGHAN CHAMBERLAIN

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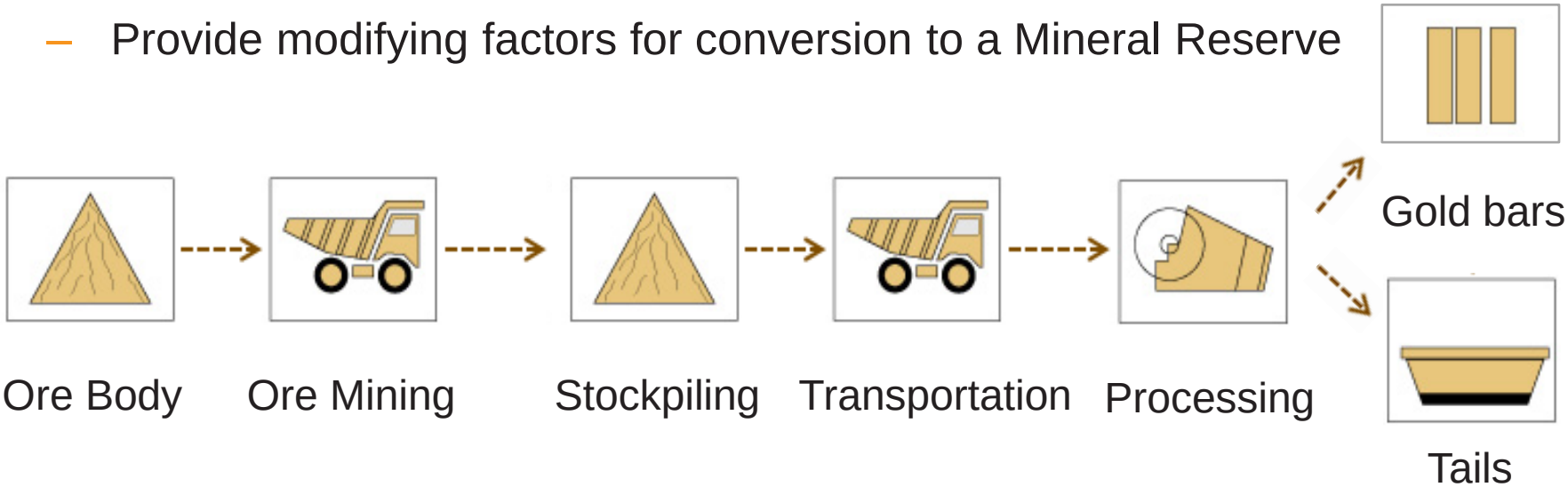
Introduction

- Any production reconciliation process must:
  - Measure the differences between each stage of the mining chain
  - Provide useful management information
  - Accurately quantify grade and tonnage estimation, dilution, and ore loss
  - Provide this for individual activities as well as across the operation as a whole
  - Provide modifying factors for conversion to a Mineral Reserve



Introduction

- AngloGold Ashanti identified the need to establish a group-wide produced grade and tonnage reconciliation system
  - as the basis for understanding potential opportunities and losses in the mining value chain
  - to provide a standardised framework for reporting
  - afford management the tools to easily compare assets
- This has been formalised in a code signed off by the CEO

Benefits in adopting a consistent approach

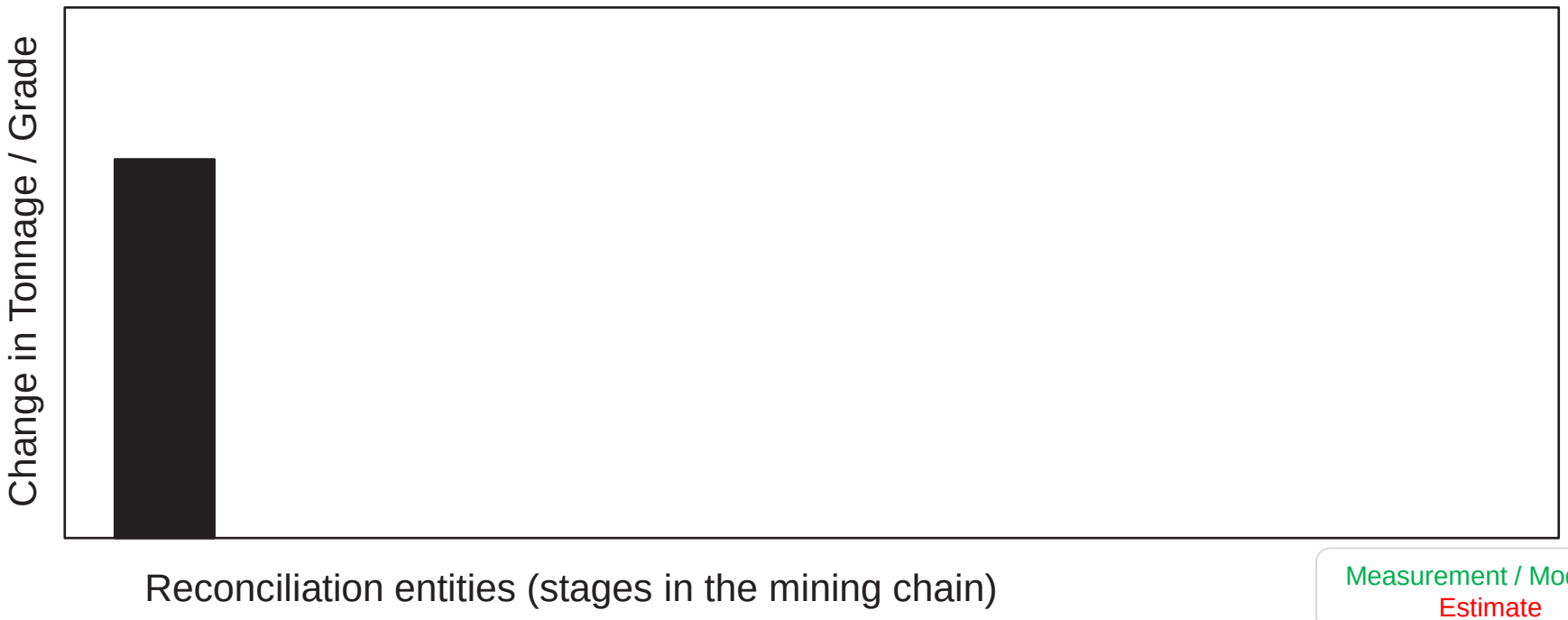
- Ensuring that inefficiencies are discovered and corrected
- Improving the possibility of detecting precious metal theft or fraud
- Increasing confidence in all activities and hence increasing confidence in the stated Mineral Reserve
- Improving the quality of management decisions across the entire value chain
- Providing a set of standard factors to be applied in mine planning

Mineral Resource Model

- Long-term planning model
- Reported for the **monthly planned volume**
- Quoted at the SMU block size

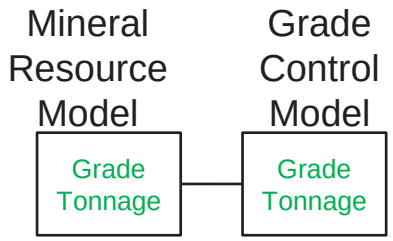
Mineral Resource Model

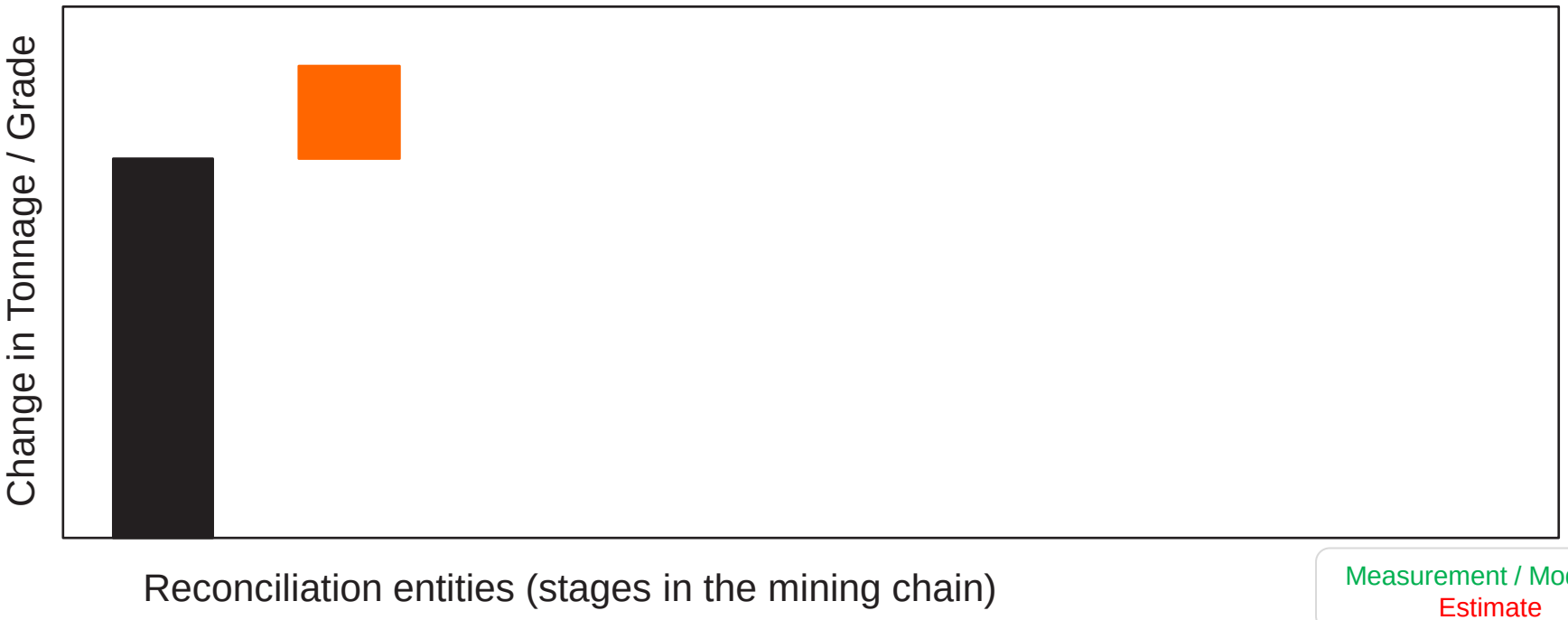
Grade Tonnage



Grade Control Model

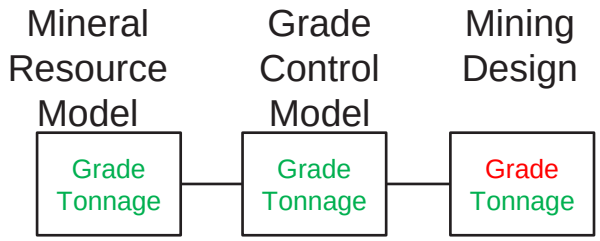
- Final model for mining, additional sampling, post-exploration
- Reported for the **monthly planned volume**
- Quoted at least at the SMU block size

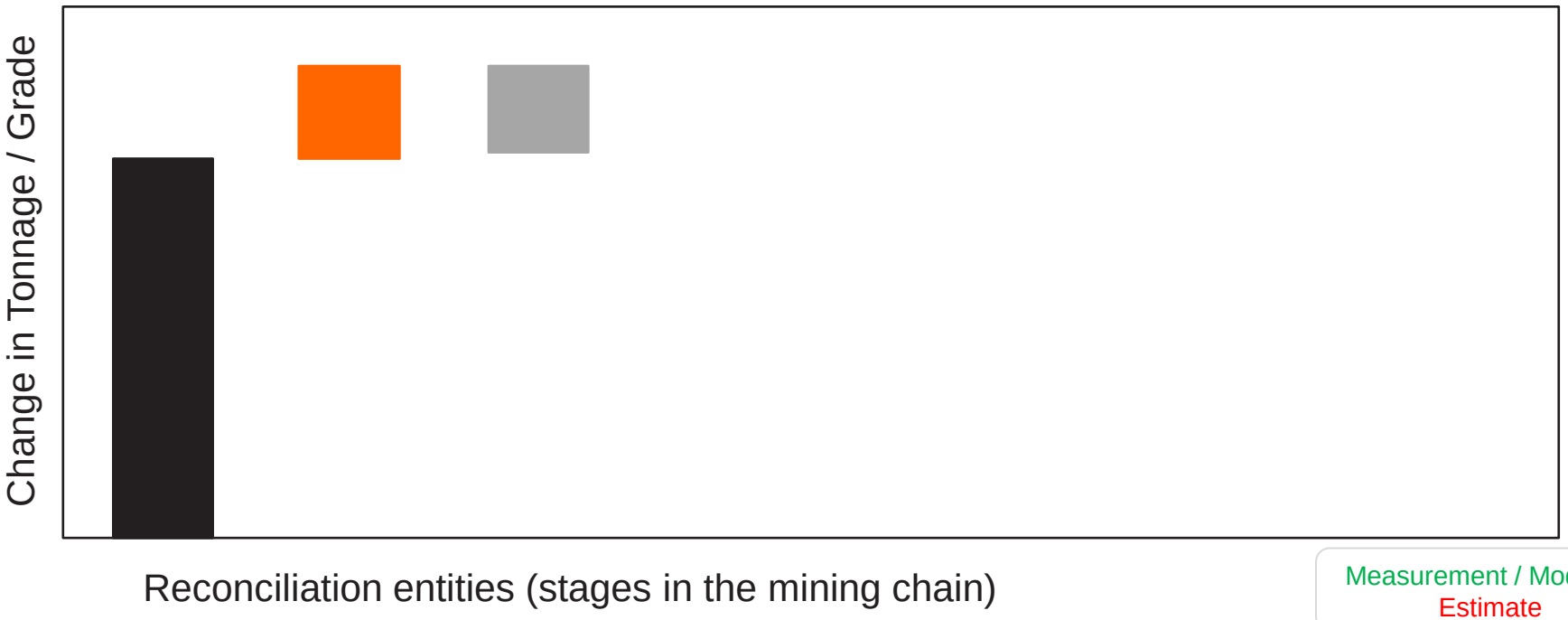




Mining Design

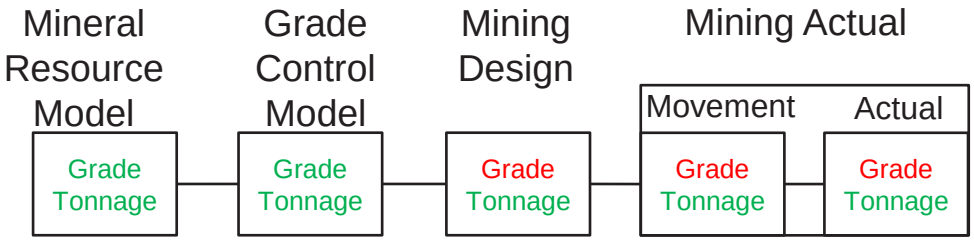
- Defining **monthly volume** to be mined
  - OP = mining perimeter, UG = reef development and stope design
- Planned dilution and planned ore loss
- Grades as estimated in the grade control model are assumed to be correct

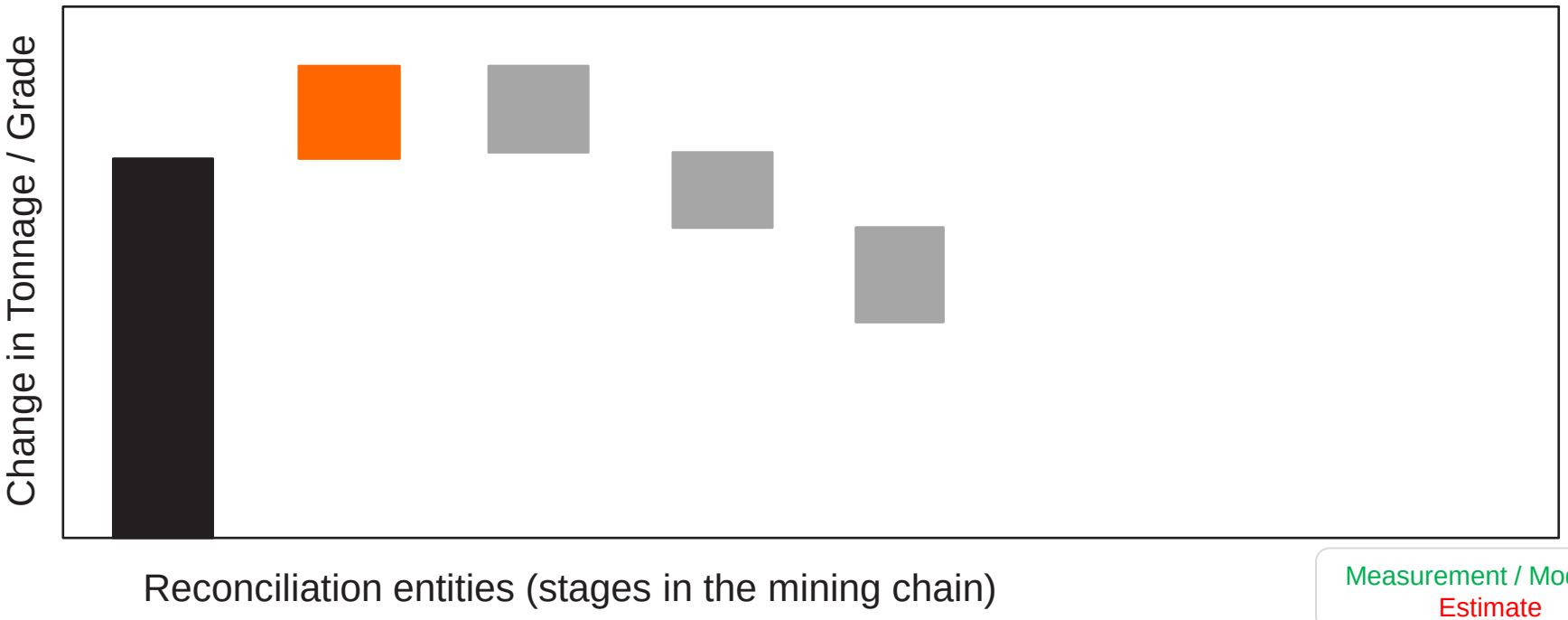




Mining Actual

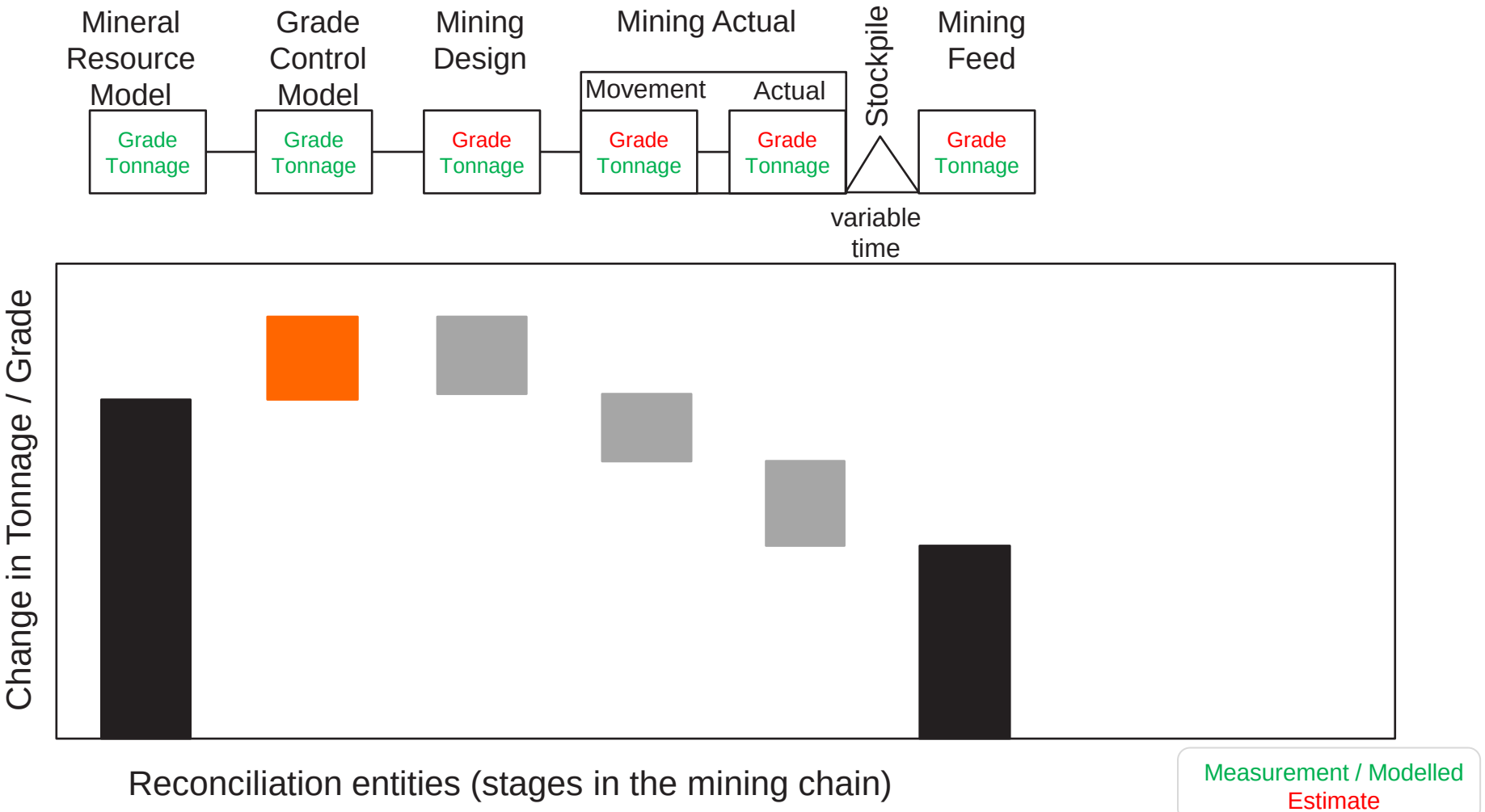
- Two measurements: Mining movement & Mining actual (minimum)
- Grade is determined by assuming that the mine design grades hold for each design
- This estimate of tonnage for the Mining actual = actual survey measurement





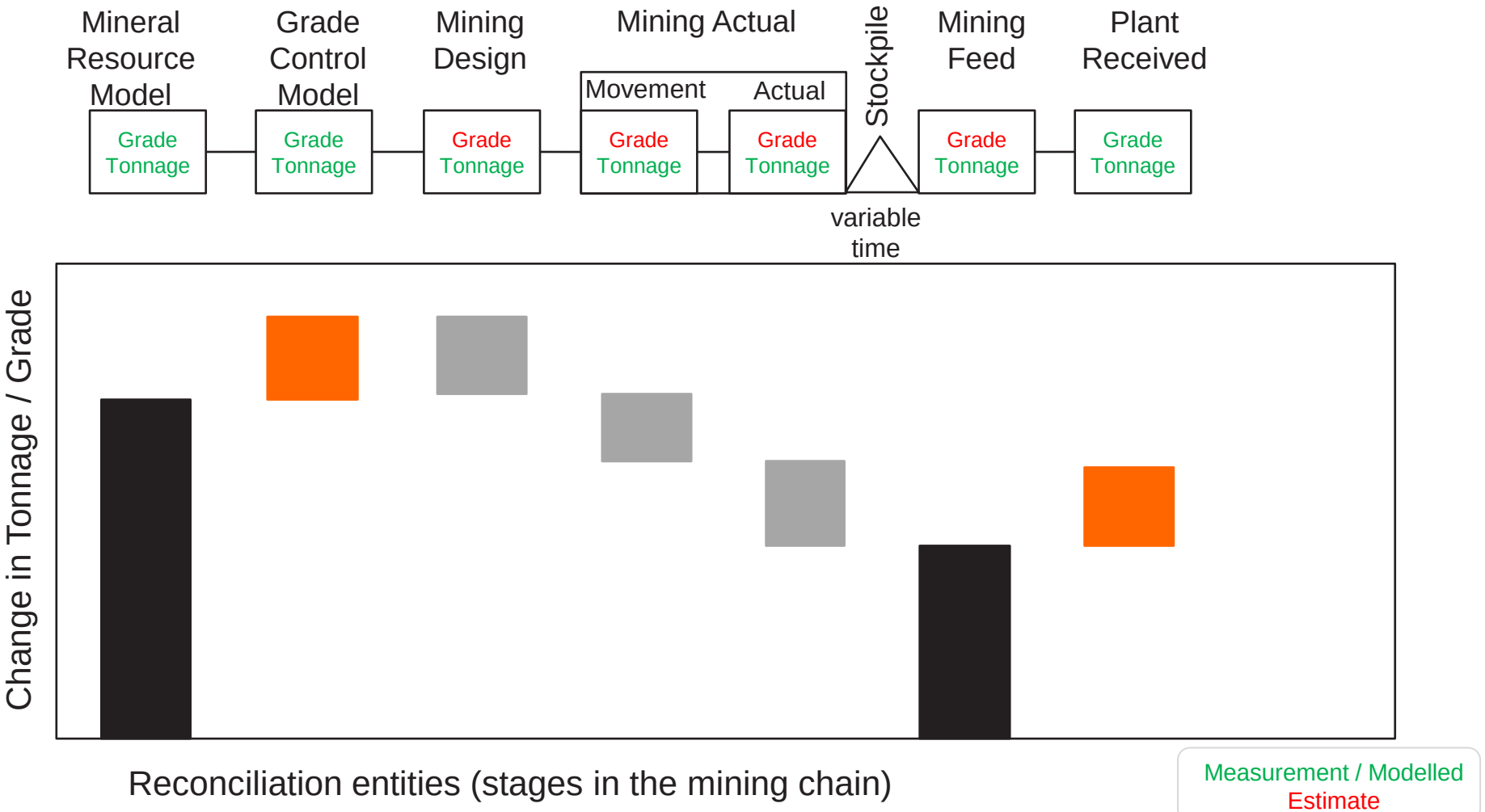
Mining Feed

- Grade and tonnage of material estimated to have been fed to the plant by the mine
- Large stockpiles - result in estimates of grade being divorced in time from the mining actual grades as well as mining actual grades swamped by less certain historic stockpile grades



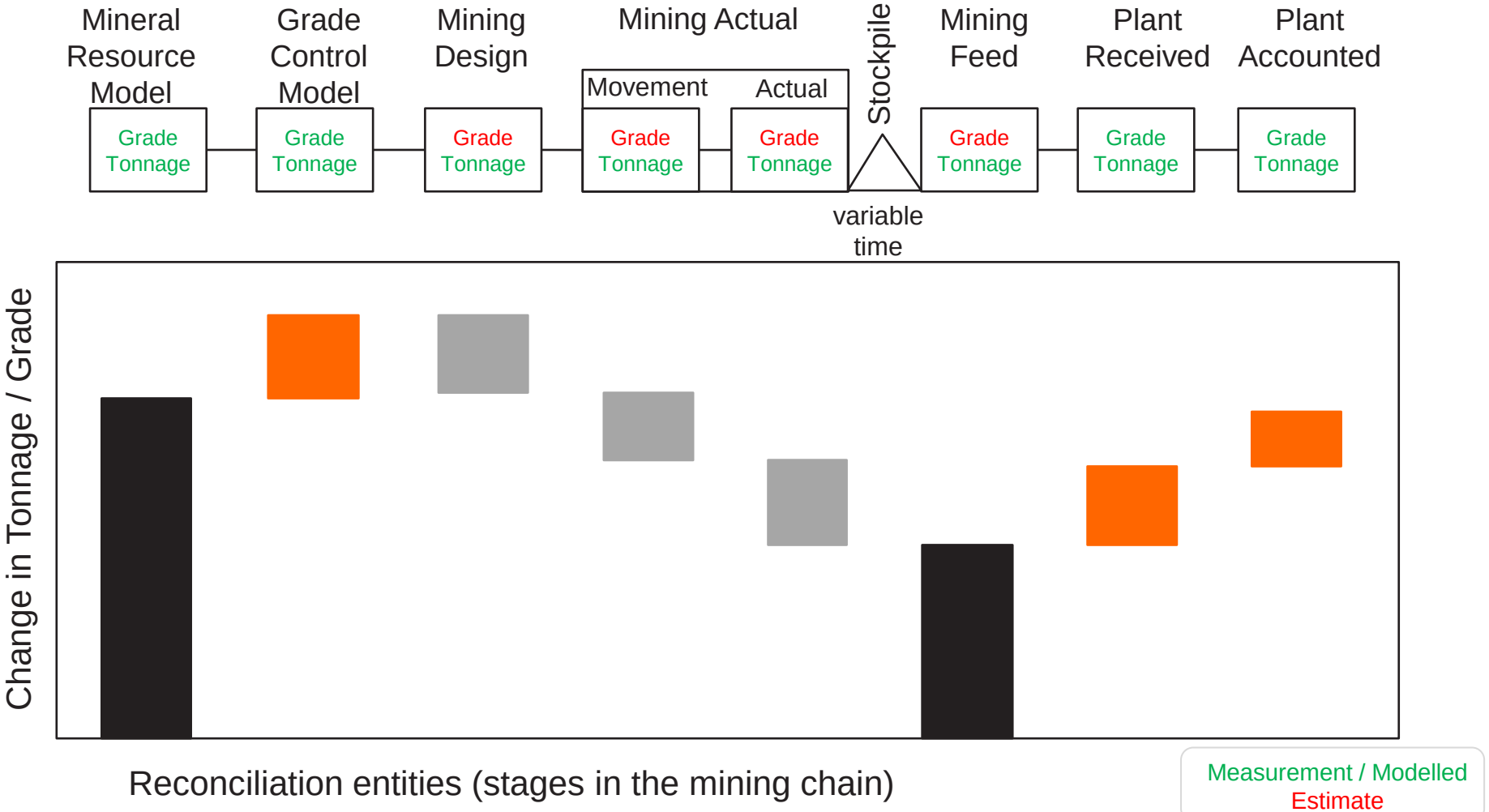
Plant Received

- Grade and tonnage of material estimated to have been received by the plant
- This consists of the measured head grade based on raw sample data and the head tonnage as measured

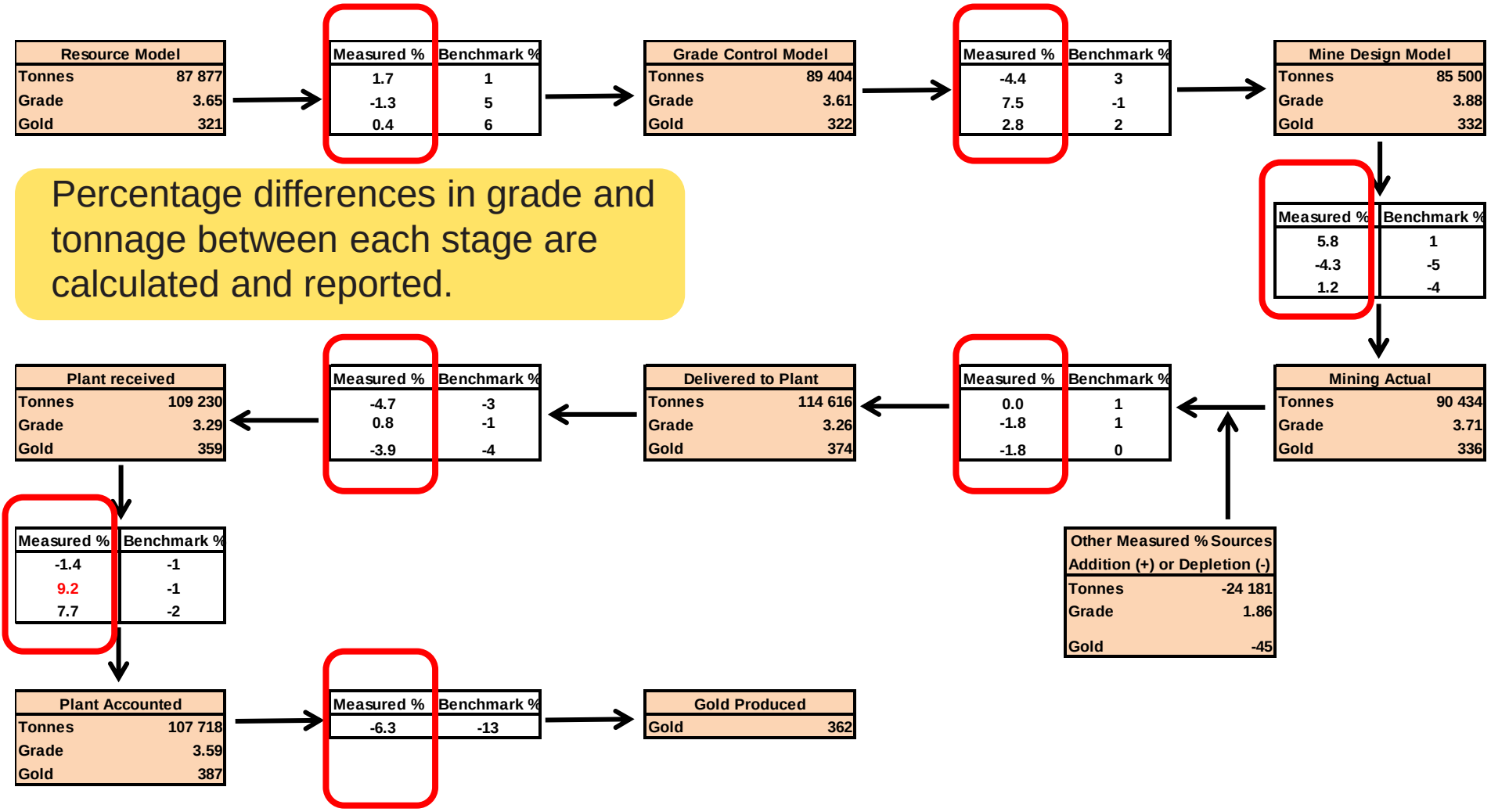


Plant Accounted

- Most accurate gold accounting metric and is essentially the total of the gold production and the gold in residue.
- It is critical that the integrity of the residue sample is not compromised in any way and that the samples are obtained, prepared, and analysed in line with standards

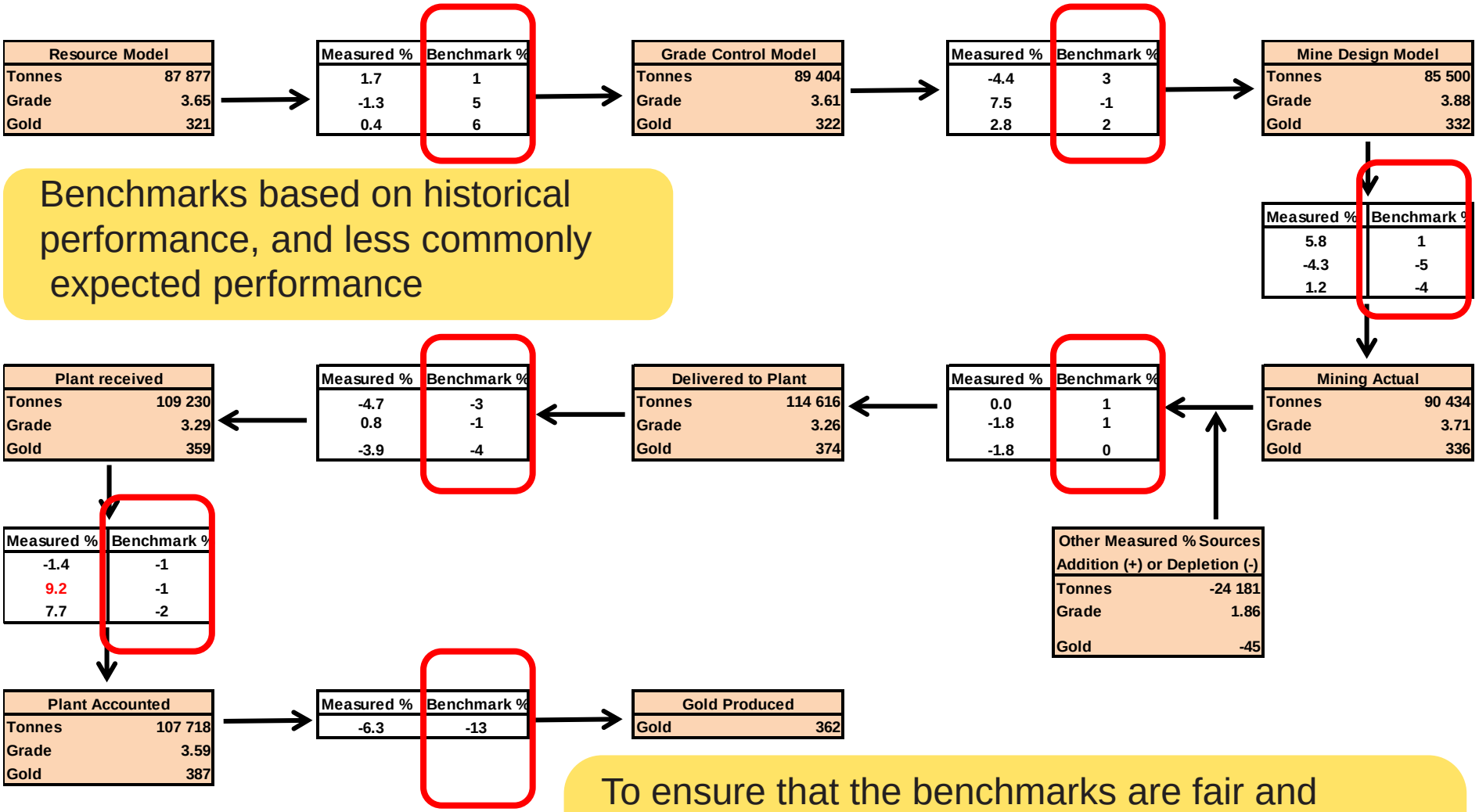


Reconciliation Process



Percentage differences in grade and tonnage between each stage are calculated and reported.

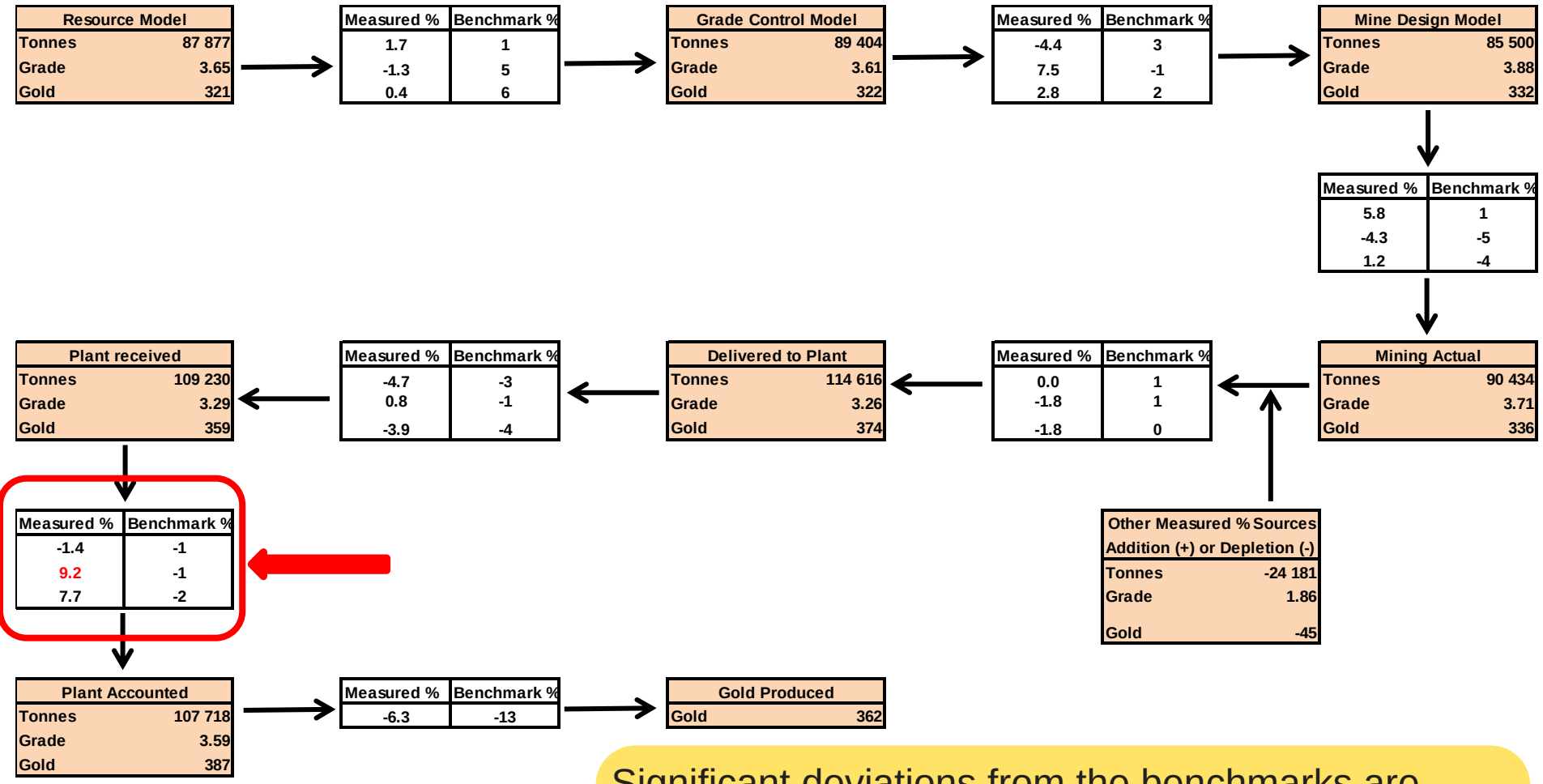
Reconciliation Process



Benchmarks based on historical performance, and less commonly expected performance

To ensure that the benchmarks are fair and relevant, the final numbers are signed off and approved between line management and the relevant discipline head.

Reconciliation Process



Significant deviations from the benchmarks are investigated and the findings, together with corrective action plans, are reported to management.

The main aspects and functionality

- Data captured electronically = a single version
- Transfer of required data from other databases = avoids duplication
- Data is converted to Information and made widely available
  - to relevant individuals
  - across various disciplines
  - at different levels of the operation and across the company
- The reporting platform is a user-friendly interface where data and comments are summarised monthly
- Users are assigned work flows and set levels of access

The main aspects and functionality

- Significant deviations from benchmarks are highlighted and comments are escalated

- Regional staff are able to:
  - view the reconciliation chain in its entirety
  - easily focus on the problem areas
  - providing their comments and proposed actions to the operations

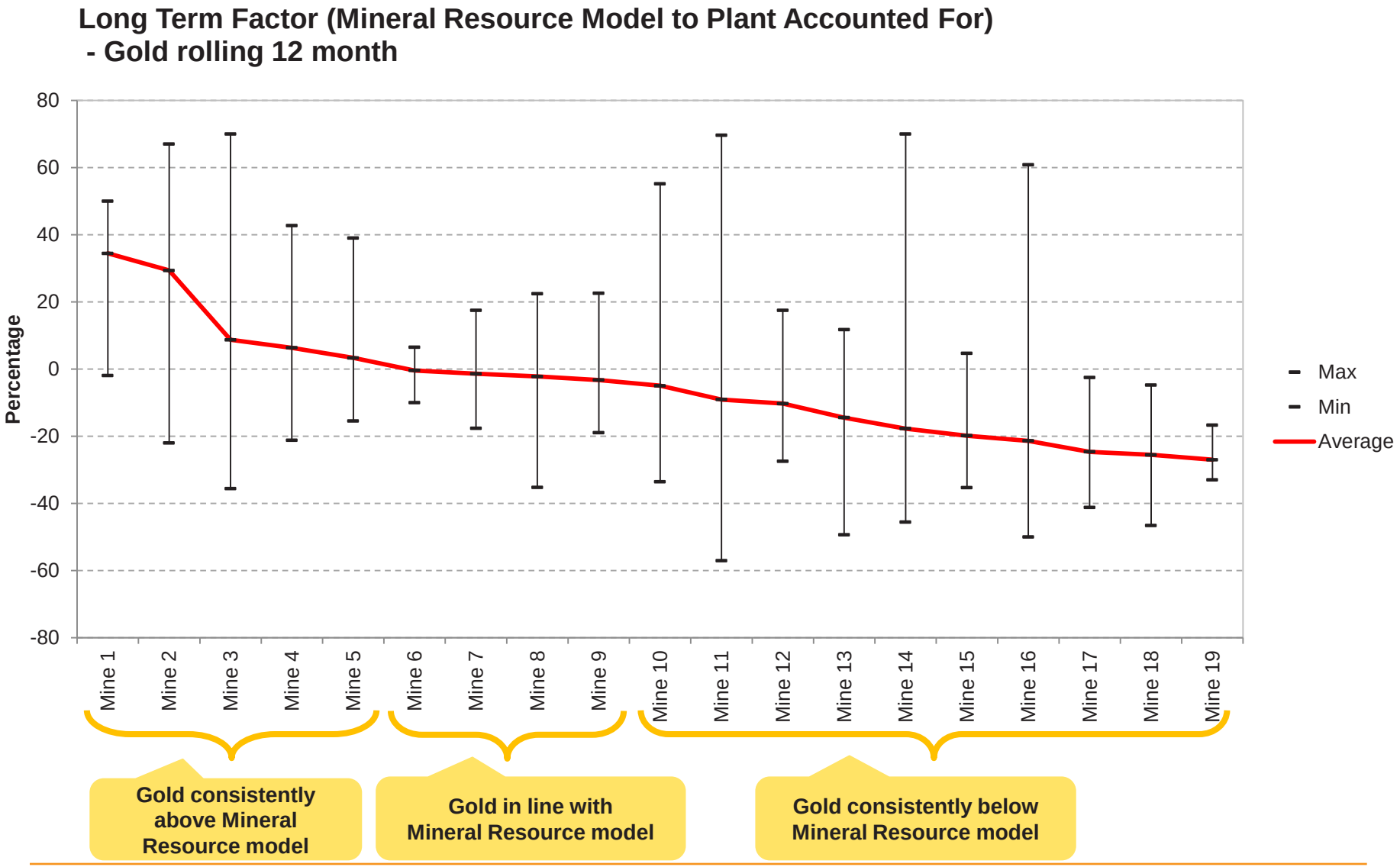
- Critical actions for each operation are reported at a Group level for upper management review and follow-up

- Multidisciplinary system ensures:
  - there are no artificial barriers between departments
  - supports the accountability being taken up at the right place

Critical success factors

- Senior management buy in.
- Site acceptance and application.
- Strong site teams – Geologist, Mining Engineer and Metallurgist
- Commitment to the capital spend required to ensure state of the art grade and tonnage measurement.
- Design for specific operations – most complicated for AGA has open pit and underground going to a plant and to a heap leach with a myriad of short term and long term stockpiles.
- Training – critical so as to ensure a pure system with no double accounting or exclusions.

What does the data tell us?



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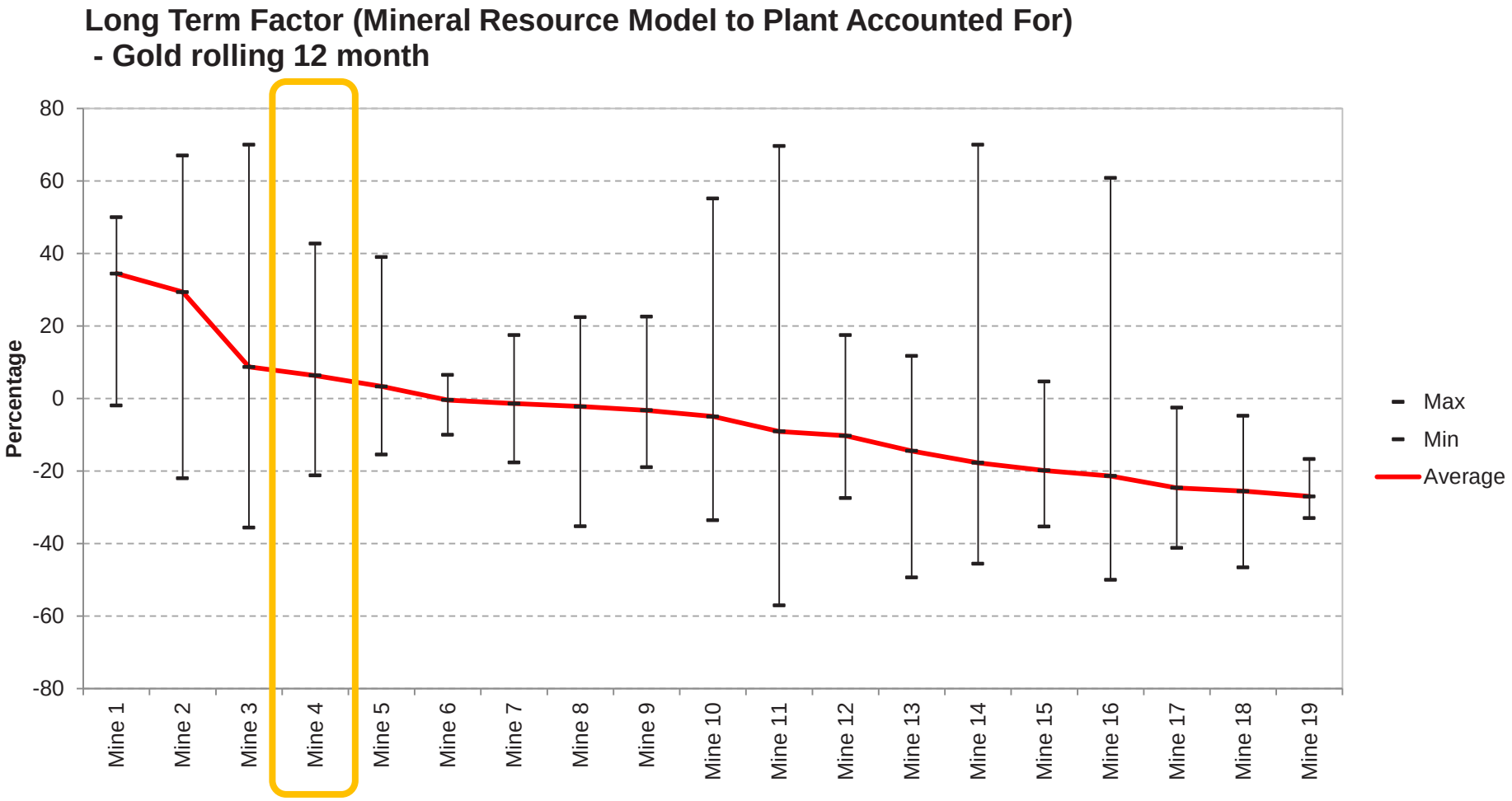

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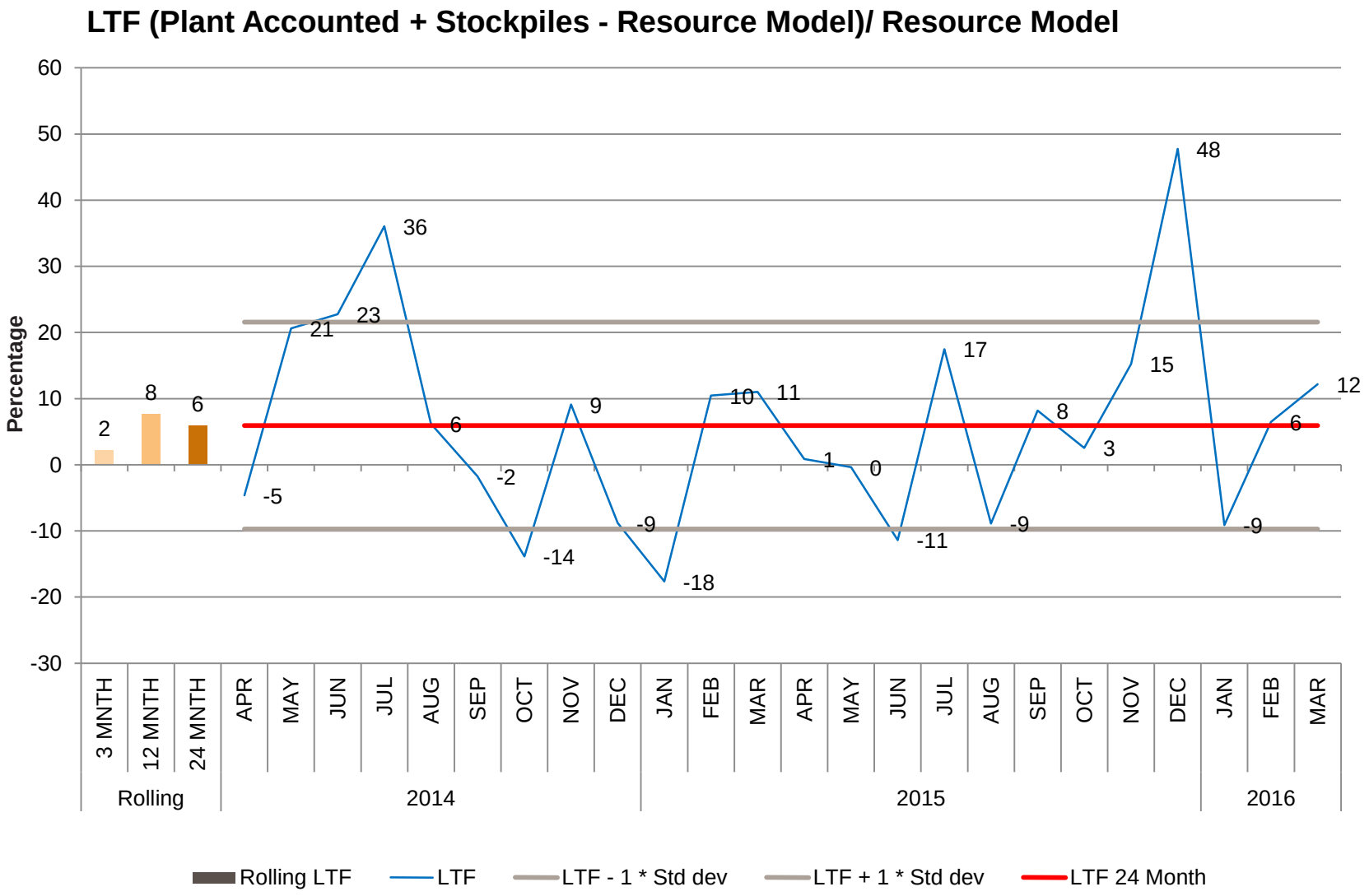

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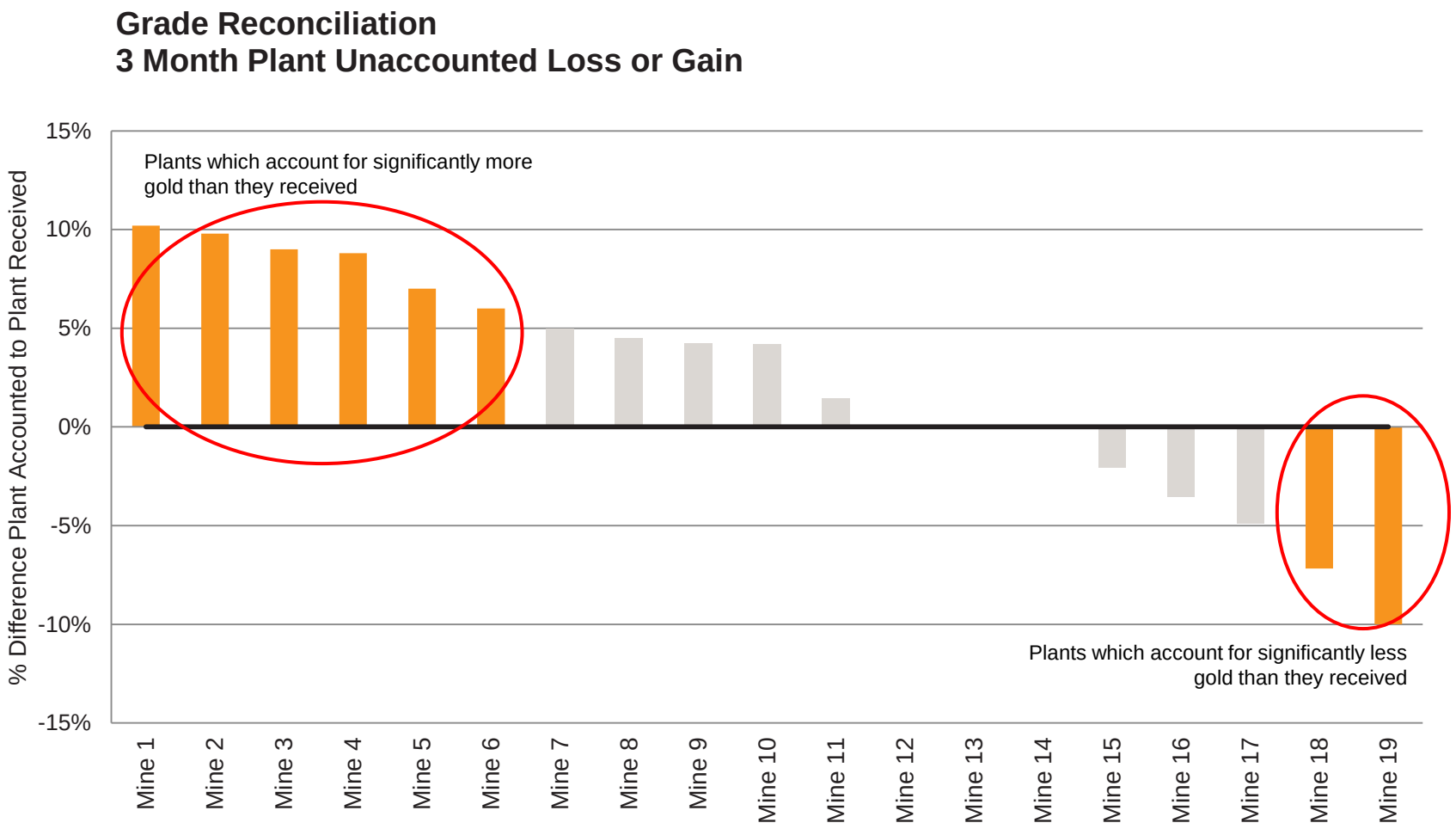

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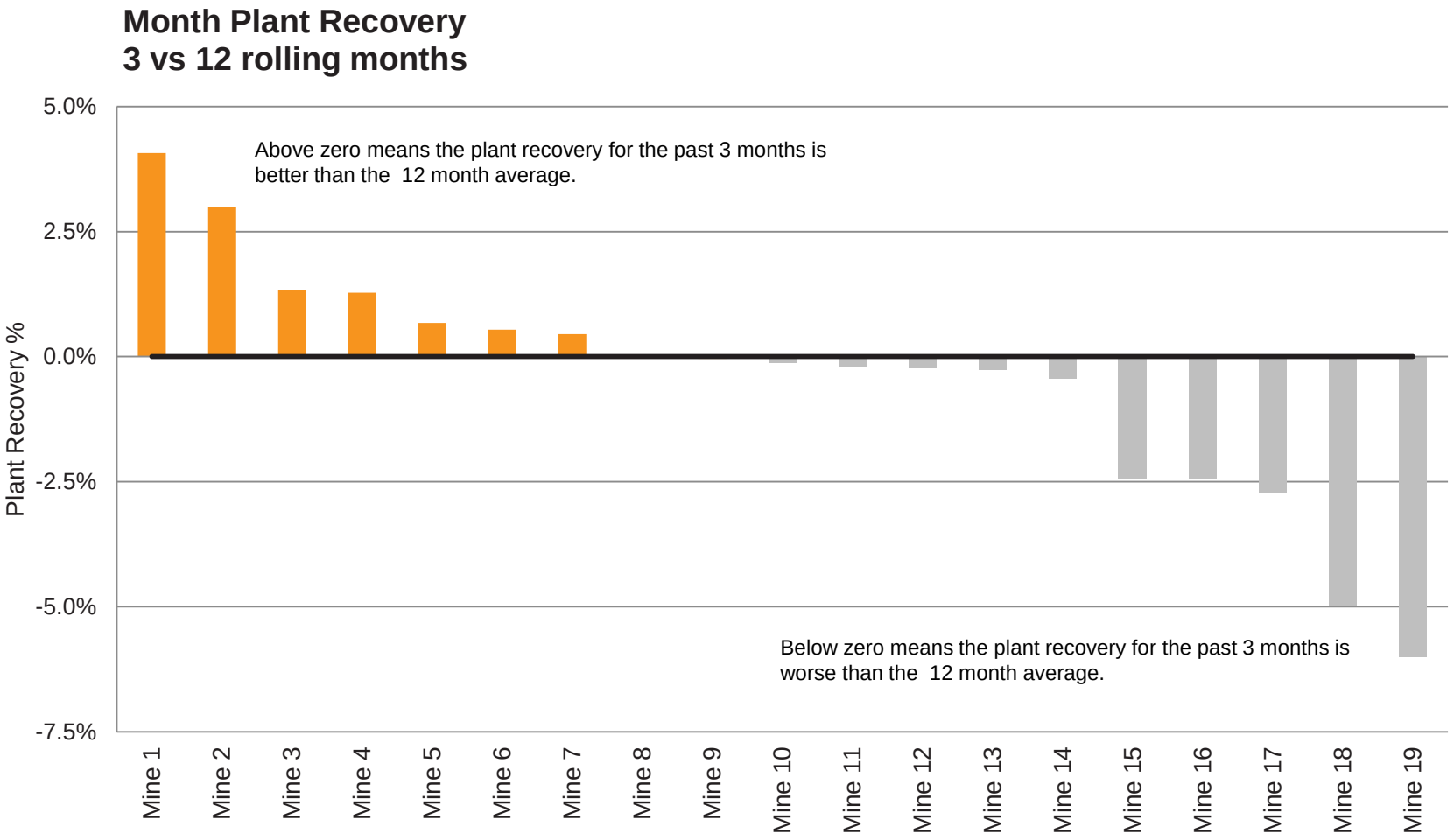

Final comments

- The company is able to quickly focus in on:

  - key operational issues
  - highlight the underlying causes
  - thus ensuring rapid response to capturing opportunities and reducing losses

- Management is provided with:
  - a mechanism to effectively benchmark the various operations across the Group
  - allowing sensible portfolio discussions to be held as a result of reliable and meaningful data
  - The tools for deeper analysis and further understanding of current mining and metallurgical processes
  - measurement of key performance metrics over time

Final comments

- A fully integrated reconciliation process
  - supported by accurate and relevant measurements
  - allow for an overall increase in the confidence in all activities across the reconciliation chain
  - increased confidence in the stated Mineral Reserve

- AGA strives to achieve the highest possible accuracy in accounting and reconciliation activities
  - thereby improving the quality of management decisions across the entire value chain
  - so as to return full value to the shareholder

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