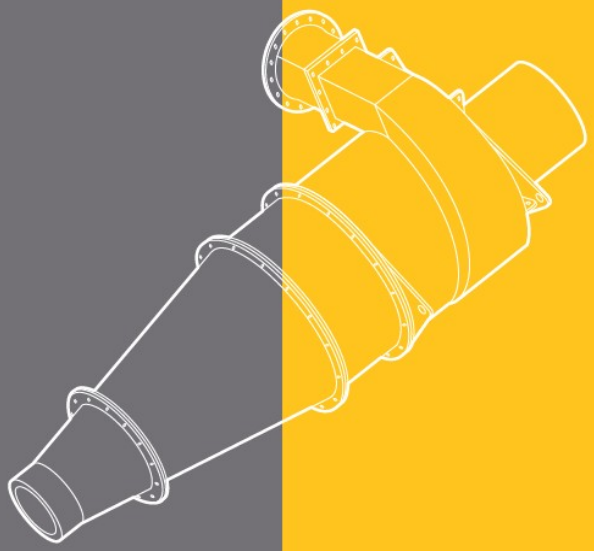
CurvePRO
OPTIMUM YIELD **MAXIMUM PROFIT**

# Medium Density Sampling Kit and Manual

DMS**PRO** Partnership Solutions

**To assist in precise medium sampling measurements**



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**CurvePRO**
Patented System
for DMS Optimisation

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# 1. Introduction and Guidance

Medium density sampling is an important part of running an efficient dense medium preparation plant. Samples are taken to verify that dense medium separators are operating consistently and at their intended medium density set point. Failure to routinely sample and optimise DMS performance can lead to sizeable yield losses.

*Partition Enterprises' test work has shown that the coal DMS cut point range of all modules, for sites which do not routinely sample dense medium and apply simple optimisation measures, averages RD 0.09. This typically results in DMC yield losses between 0.5-2.0%, which can usually be avoided with medium sampling, calibrations and set point adjustment.*

This manual will guide you through the supplied equipment, testing preparation and method required to take an accurate medium density sample. With a good and consistent procedure, repeat feed medium samples, at a site with medium density gauge fluctuations within +/- 0.003RD of set point, should fall within a 0.020kg range.

**For guidance on DMS operation and determining next steps towards DMS optimisation,**
**please contact Partition Enterprises**

# 2. Preparation and Calibration

## 2.1. Equipment

- 4 x Plastic Marcy buckets 1L
- 2 x 1.2m – 2.4m extendable pole
- 2 x Precision hanging scales, up to 3kg in 2g increments
- 2 x Spring clamp and bungee cord
- 2 x Sampling bottle
- 3 x 500g calibration weights

*Figure 1: Complete Marcy Sample Kit*

## 2.2. Installation

Hang the scales by the attached bungee cord, using the quick clamp affixed to a beam which has minimal vibration and is in an area of low dust and water spray.

## 2.3. Correct Function of Scales

Before proceeding with measurements use the 3 x 500g calibration weights check for correct function of the hanging scales. If the scales are not measuring 1.0kg and 1.5kg to within 2g, please contact Partition Enterprises.

## 2.4. Calibration of Marcy Bucket

Conduct Marcy Bucket calibration at the start of any day of sampling

- Inspect Marcy bucket and ensure it is free of any residual solids
- Zero empty bucket on the scales
- Calibrate bucket with clean water
- Place onto scales with overflow holes covered
- Allow overflow and record the measured water weight

*Figure 2: Calibrating Marcy Bucket*

**If the water weight does not equal 1.000kg, use the water weight as a factor to correct for Marcy bucket volume when calculating density.**

## 3. Sampling Process

It is highly recommended that Partition Enterprises' Marcy sampling video is viewed. The video can accessed via this Dropbox hyperlink.

### 3.1. Feed Medium Sampling

- Inspect test leg for blockages
- Set Marcy bucket down near a drain
- Fill plastic bottle ¾ with slurry
- Agitate the sample thoroughly within the plastic bottle
- Invert the bottle, discarding the first moment of the pour
- Allow the reset of the sample to fill the Marcy bucket with ensuring the container close to fully inverted, sealing the two overflow holes with fingers
- Allow the bucket to fill slightly above overflow holes, discarding remaining slurry in container
- Place bucket onto scales, remove fingers to allow overflow and let scales settle
- Record the following information:
    - Measured value
    - Time of sample
    - Location of sample collection
    - Any other relevant observations

### 3.2. Overflow and Underflow Medium Sampling

- Identify the overflow and underflow deslime screen, the sampling points are typically on the backside of these screens
- Fill the bottle ¾ full, sweeping across the width of the screen to avoid bias in the sample
- Agitate the sample thoroughly within the plastic bottle
- Invert the bottle, discarding the first moment of the pour
- Allow the reset of the sample to fill the Marcy bucket with ensuring the container close to fully inverted, sealing the two overflow holes with fingers
- Allow the bucket to fill slightly above overflow holes, discarding remaining slurry in container
- Place bucket onto scales, remove fingers to allow overflow and let scales settle
- Record the following information:
    - Measured value
    - Time of sample
    - Location of sample collection
    - Any other relevant observations

A minimum of three rounds of sampling should be conducted for accuracy. If the first three measurements have considerable variation, take additional samples.

See below photos for examples of Partition Enterprises' preferred method of Marcy sampling.

*Figure 3: Sampling Feed Medium Slurry*

Figure 4: Sampling Underflow Medium Slurry

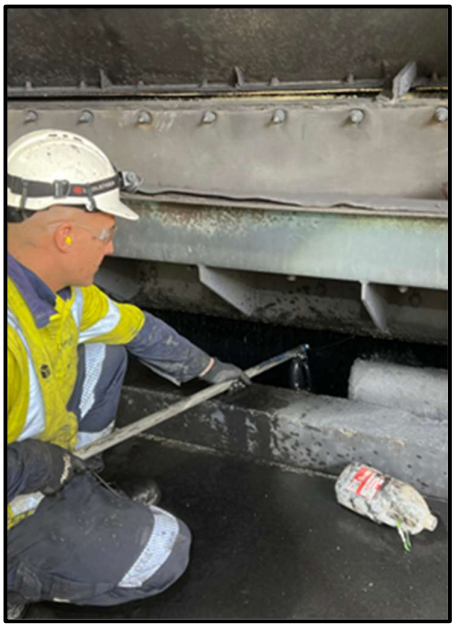

Figure 5: Sampling Overflow Medium Slurry

Figure 6: Agitating Sample

*Figure 7: Filling Marcy Bucket*

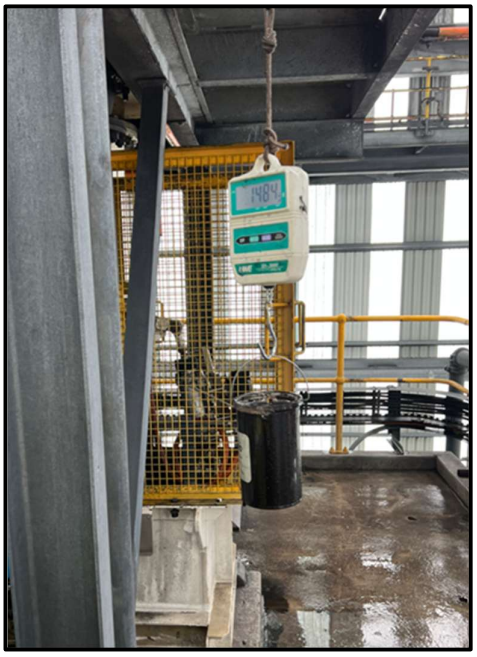

Figure 8: Result

## 4. Marcy Sample Recoding Sheet

See Next Page

DATE: _____ NAME: _____

SITE: _____ MARCY WATER CALIBRATION (g): _____

MODULE: _____ SET POINT: _____

| SAMPLE | FEED | | OVERFLOW | | UNDERFLOW | |
|---|---|---|---|---|---|---|
| | TIME | WEIGHT | TIME | WEIGHT | TIME | WEIGHT |
| #1 | | | | | | |
| #2 | | | | | | |
| #3 | | | | | | |
| #4 | | | | | | |
| #5 | | | | | | |

**NOTES:**