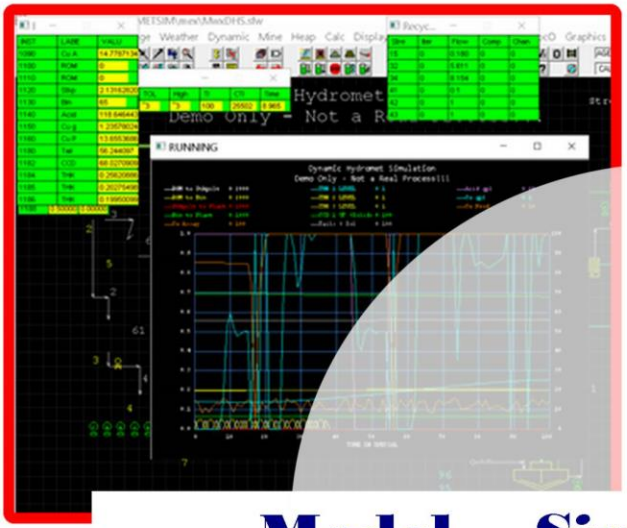
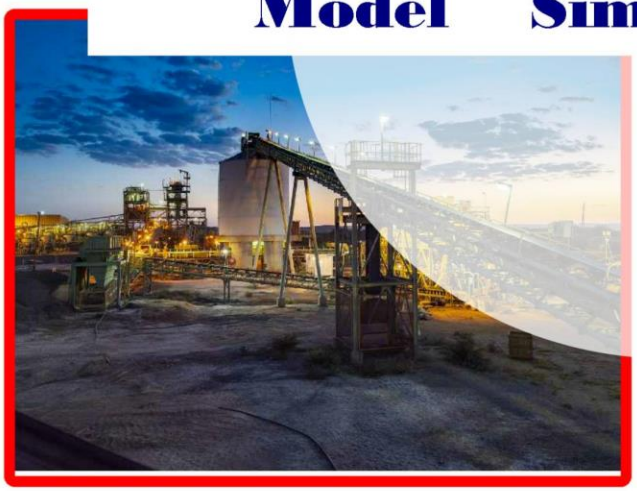
PATFIO INVESTMENTS PVT (LTD) COMPANY

Solution to your design problems & needs!

SIMULATION FOR MINERALS INDUSTRY TRAINING HANDBOOK 2020



Model Simulate Optimize



Eng. P Chesa, 2020

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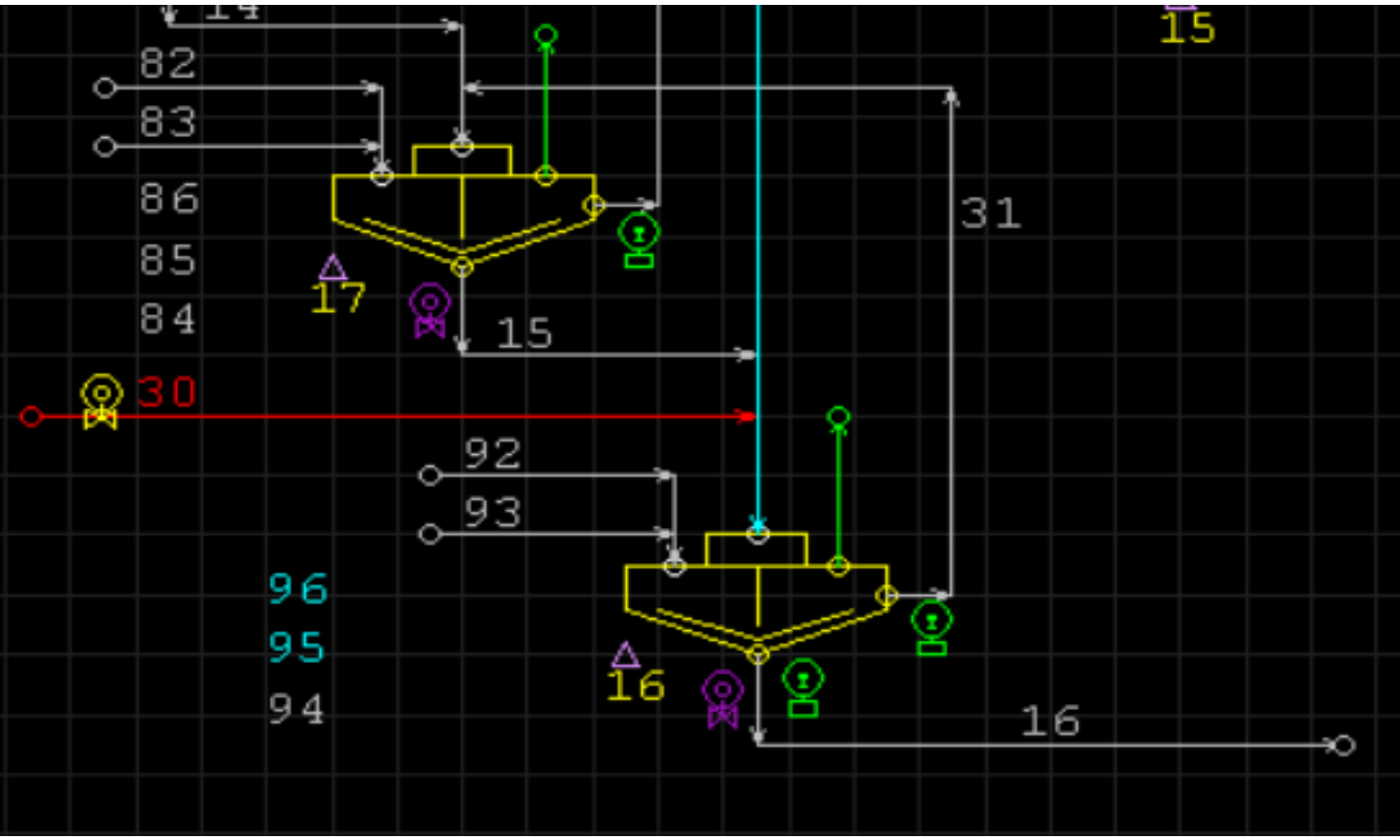
PRACTICAL 1

NAVIGATIING METSIM UI

What can you see on this Flowsheet?



- Line colors:
  - Red=empty=red
  - White=solid
  - Blue=aqueous
  - Green=gas
  - Dark green=organic
  - Molten phases yellow/orange/dark red
- Number on lines: stream number or any chosen parameter

RIBBONS IN METSIM

Open METSIM software and identify the following Ribbons.

Calculate one unit operation – on activation any selected unit operation can be calculated.

Calculate Current Section – on activation all unit operations in the current section will be calculated.

Stop Execution - On activation will immediately stop flowsheet calculations. Used to abort calculations as determined by the user.

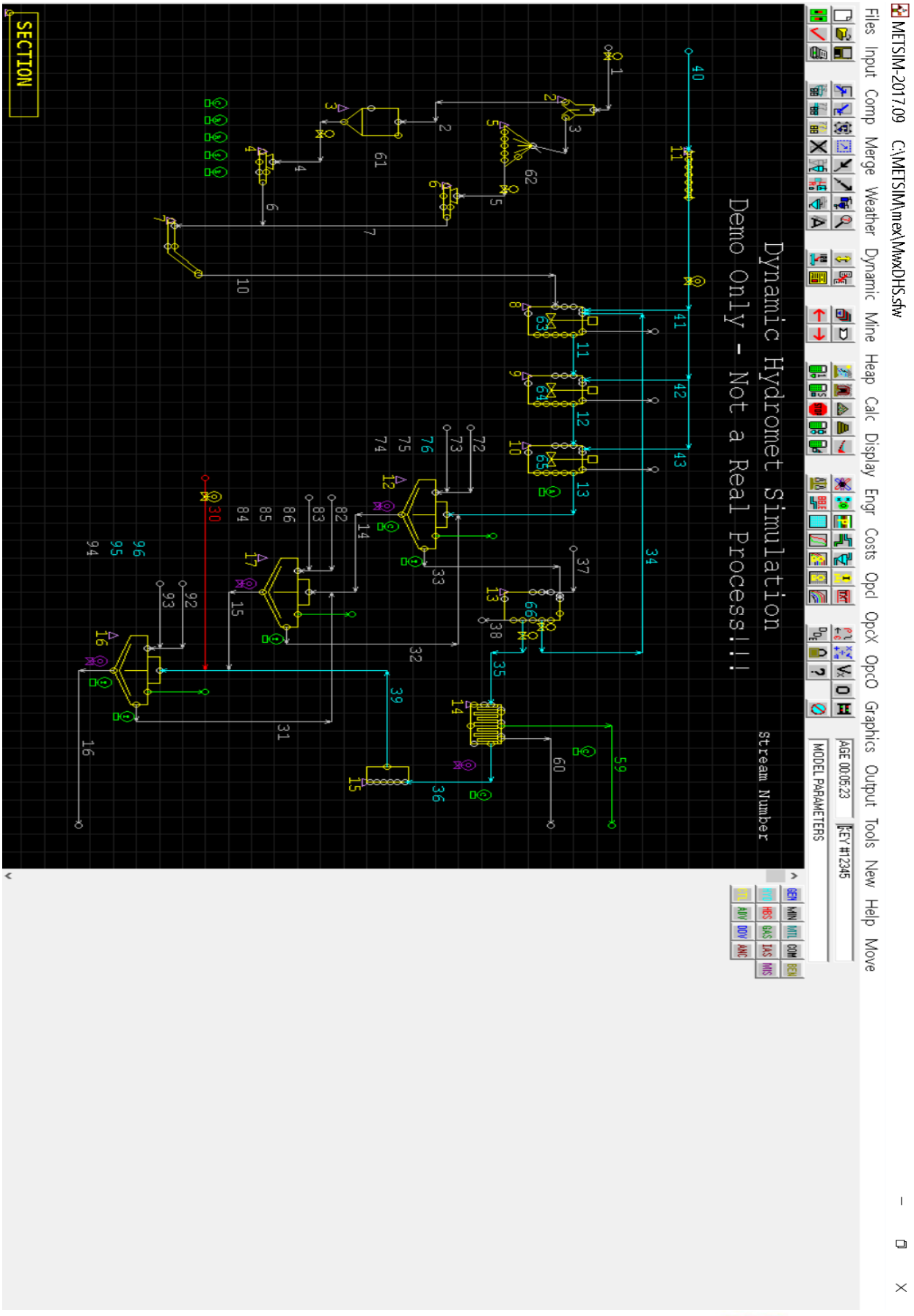
Calculate Unit Operation Range – used to repeat calculations over the range determined by the user through SCAL.

Calculate All Unit Operations – used to calculate the full flowsheet from any section. Useful for situations where the user may wish to observe flowsheet changes during simulation.

Open any Model in METSIM folder

File>Open…retrieve model>local disk C>METSIM>MEX

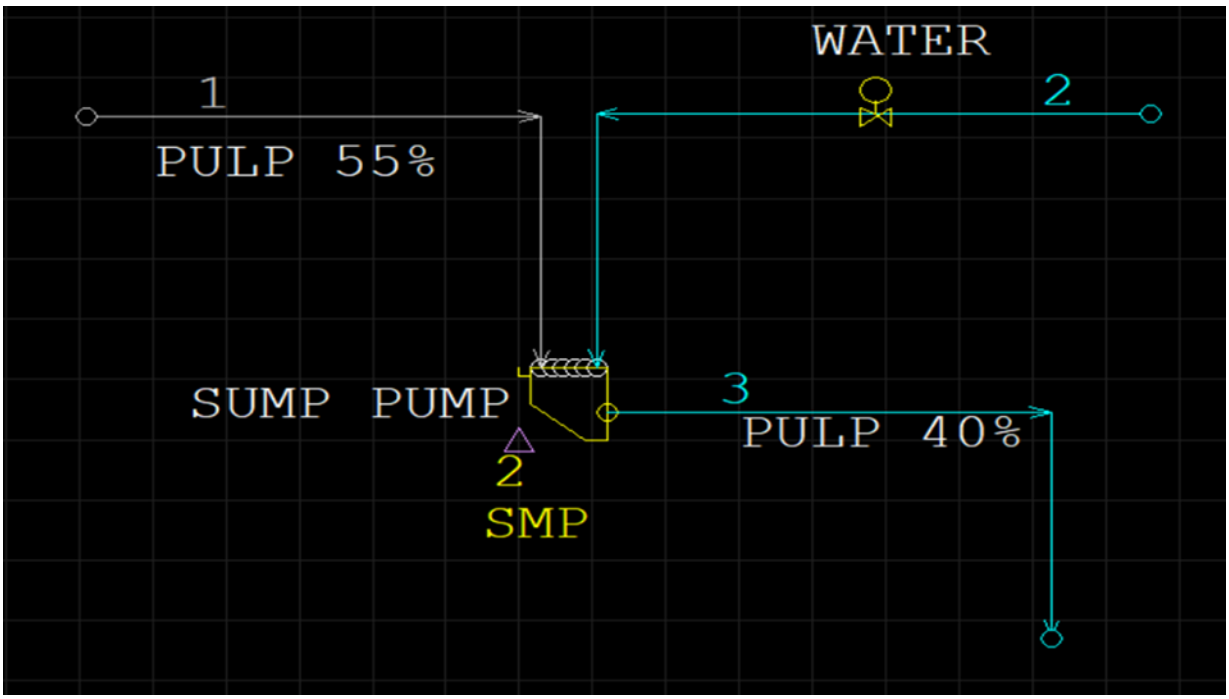
Some of the Flowsheets in METSIM



PRACTICAL 2

SUMP TANK SIMULATION

SUMP TANK SIMULATION



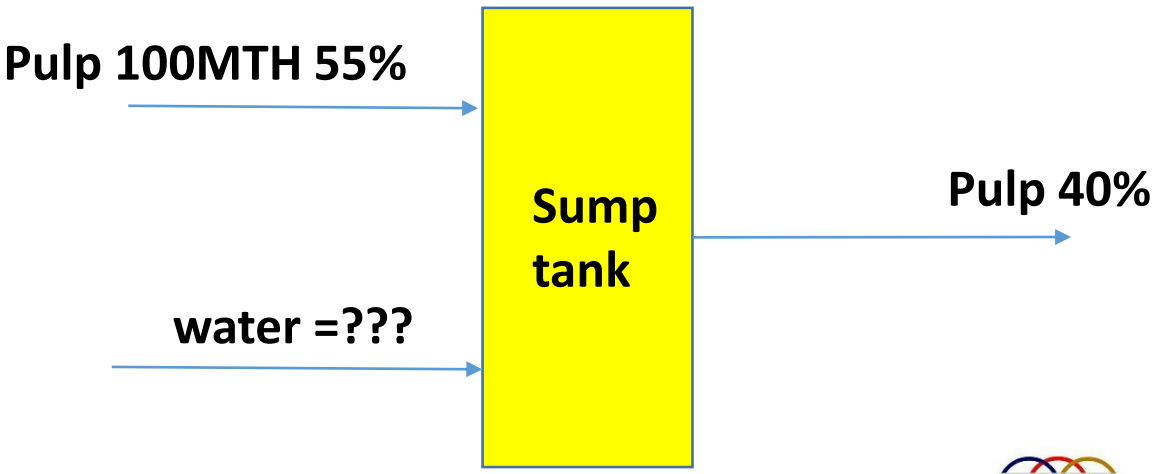
OBJECTIVES

1. Know how to model
2. Know how to do material balancing
3. Know how to use controls
4. Know how to add texts on unit operations and streams

PROBLEM DESCRIPTION

A Pulp feed at 55% (SiO_2) enters a sump tank alongside a water stream.

You are to determine the amount of water needed to achieve a 40% solids content in the outlet stream. The residence time of the sump tank is 25mins.



PROCEDURE

1.Add a Sump from the GEN

2.Add streams

3.Rename the streams

4.Add elements and components " water &quartz"

5.Edit the components by deleting unnecessary components.

6.Edit the parameters to "Metric tonnes /hr "

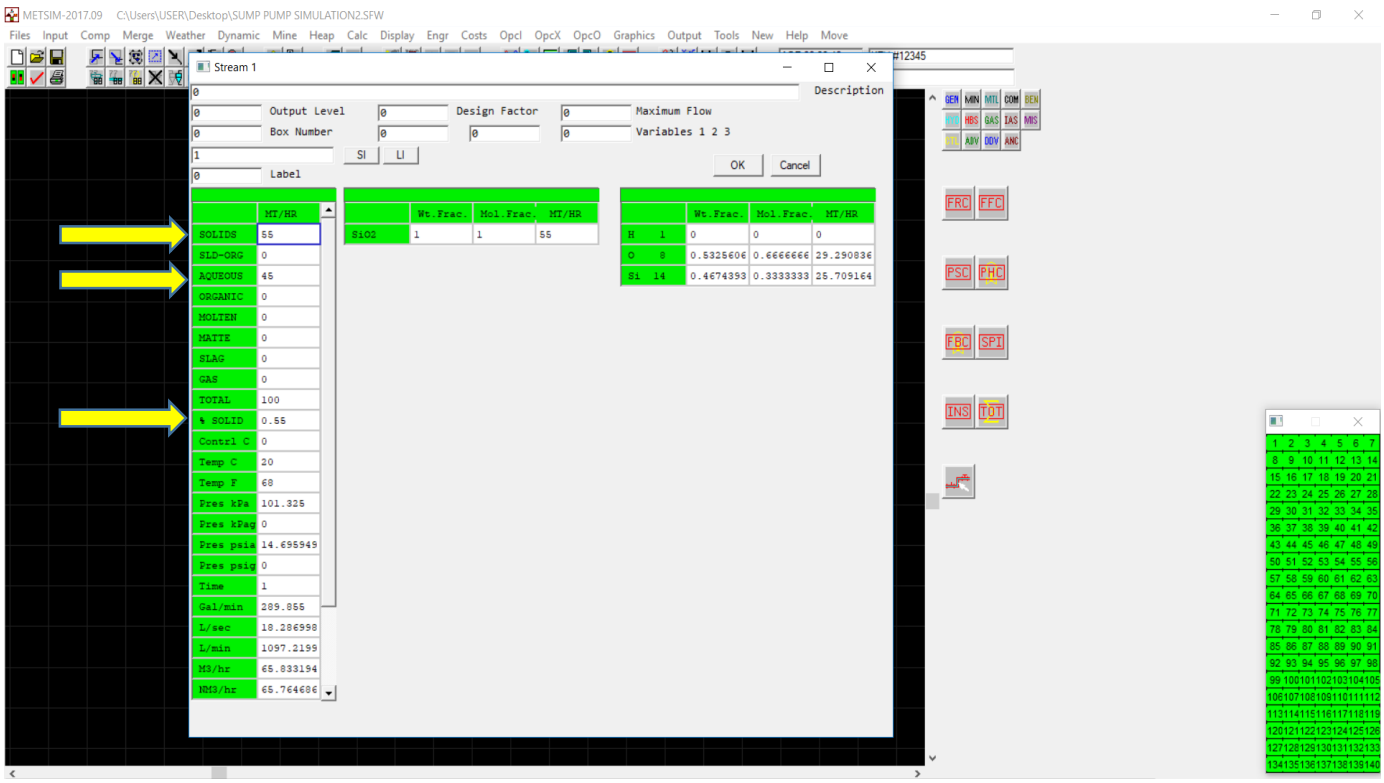
7.Add components to the streams. To pulp percentage solids @55% to make a total of 55mt/hr solids in the dialogue box.

8.Add 10mt/hr H2O to water stream

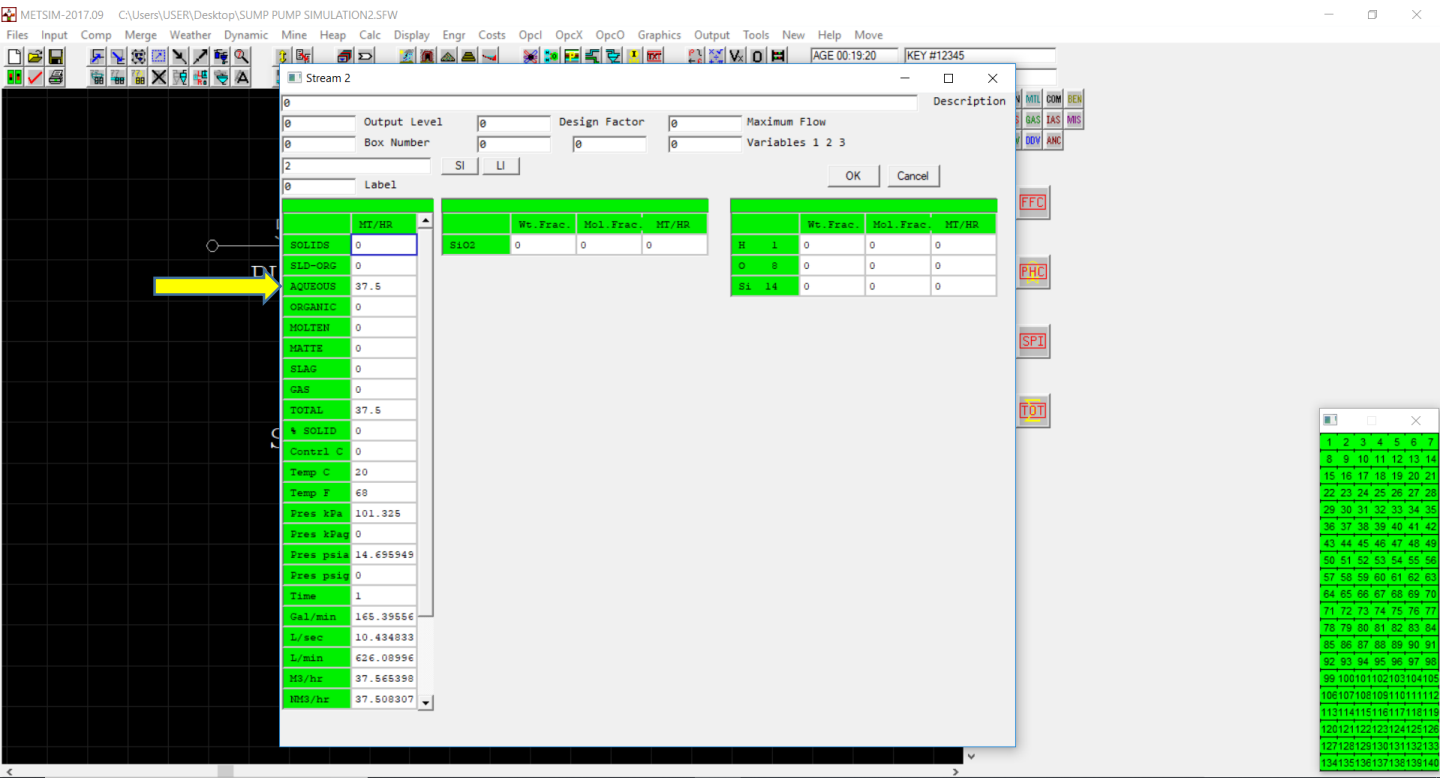
9.Edit the sump unit operation and add residence time

10.On the display value function tab add "% solids" to the streams. Calculate the unit operation and discuss your results with your neighbor. Did you achieve the desired Outlet stream parameters?

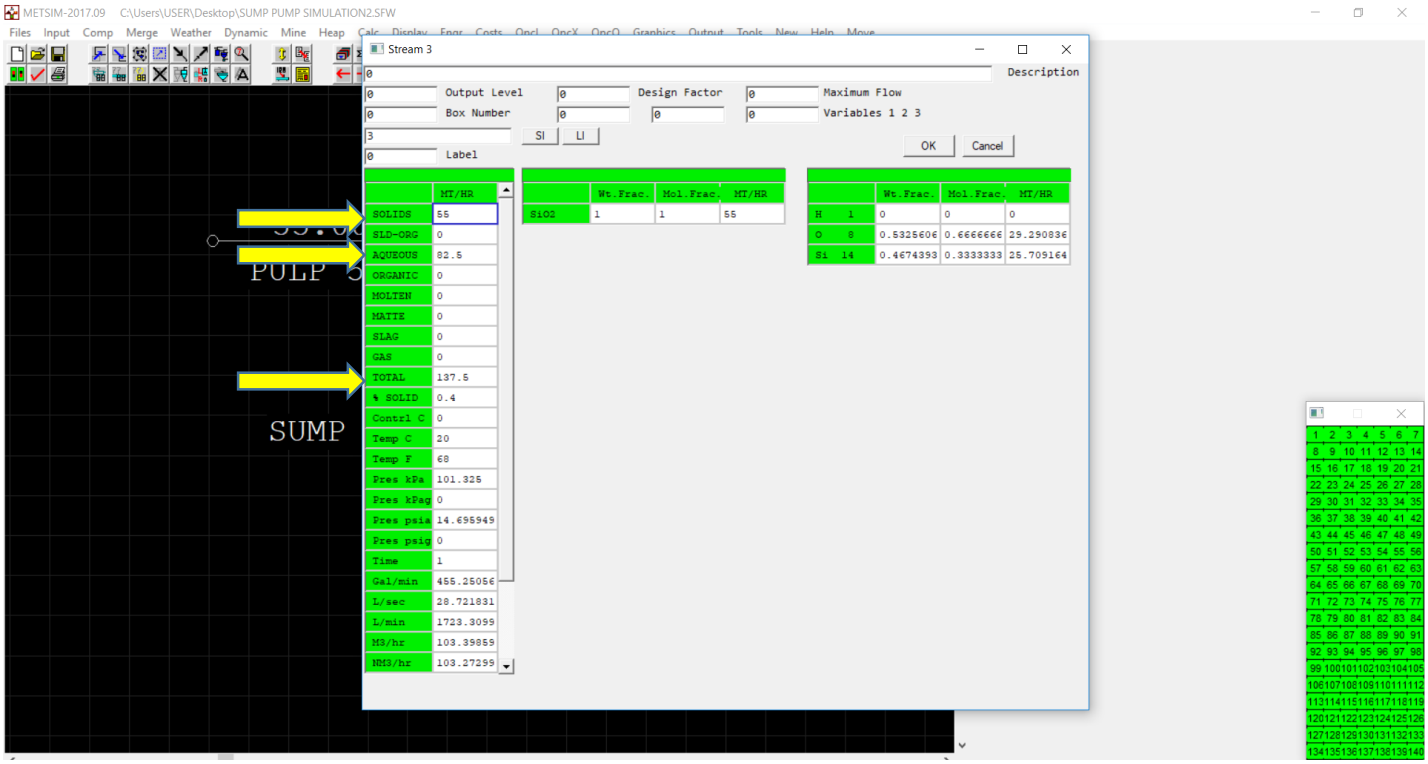
CONFIGURE STREAM 1



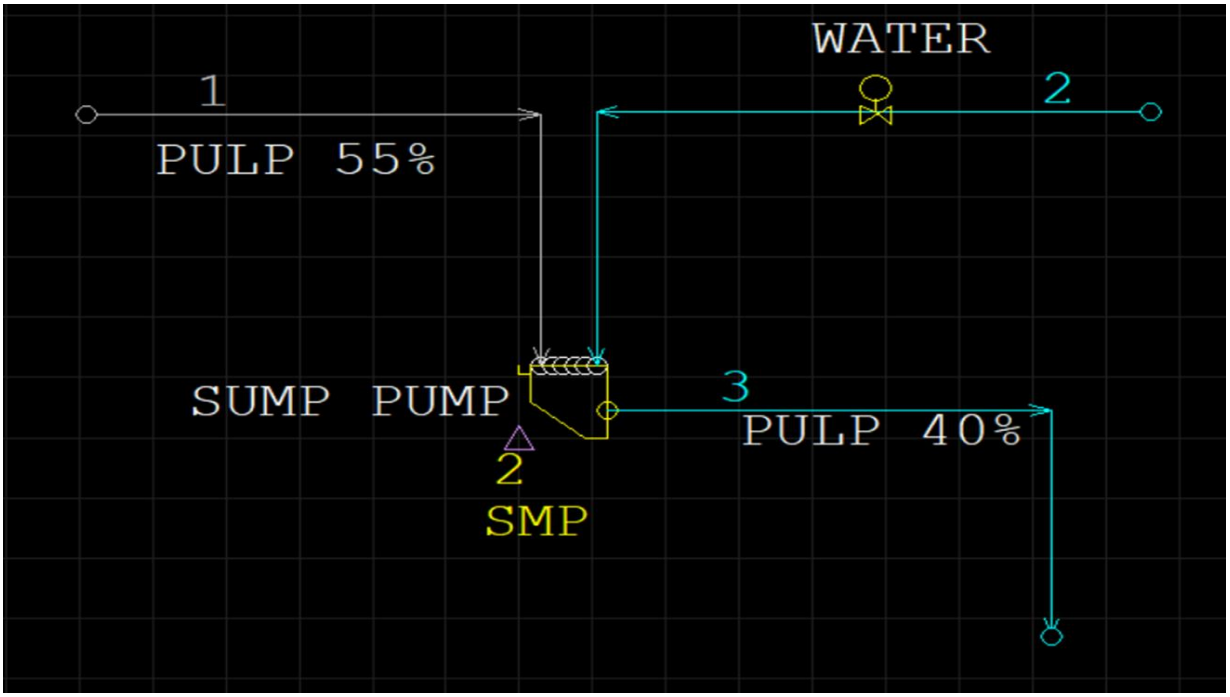
CONFIGURE STREAM 2

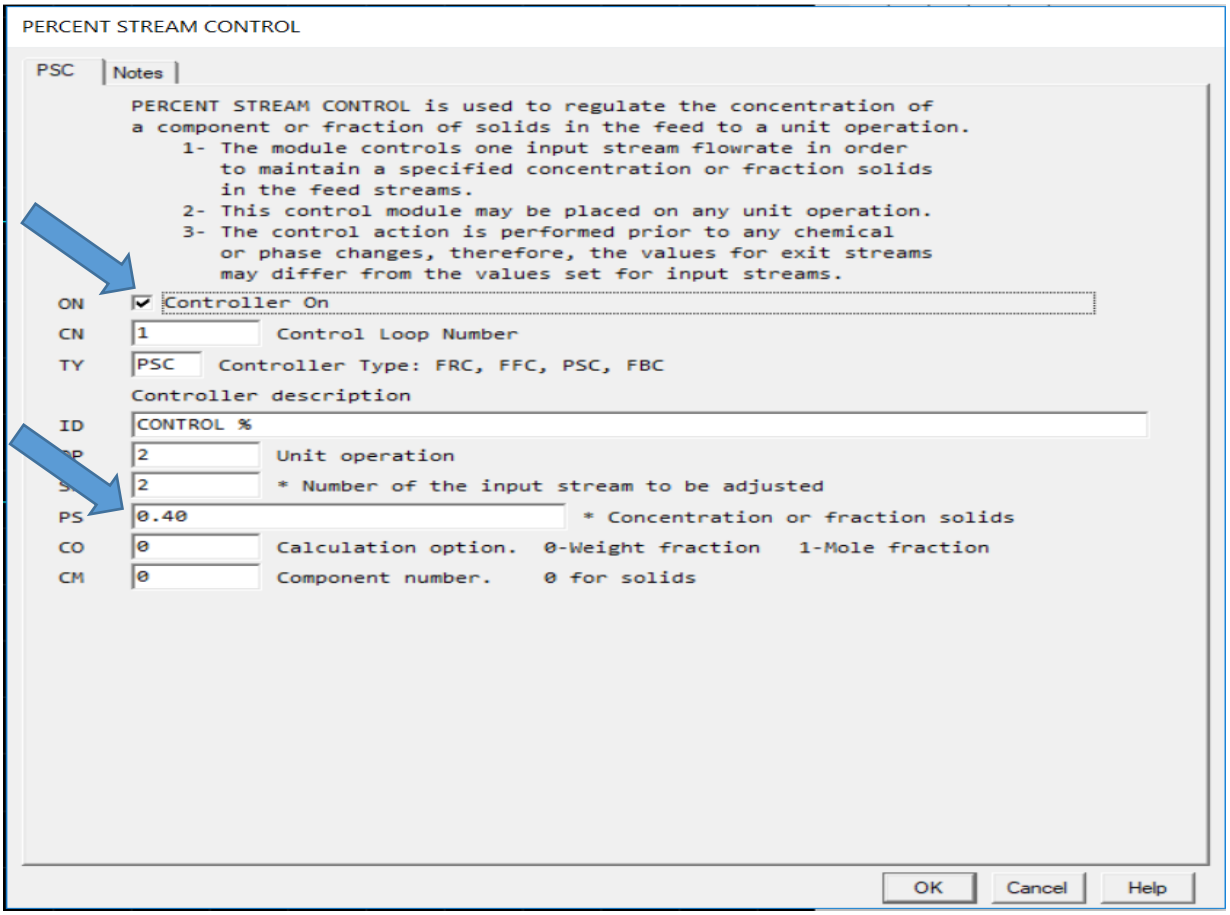


CONFIGURE STREAM 3

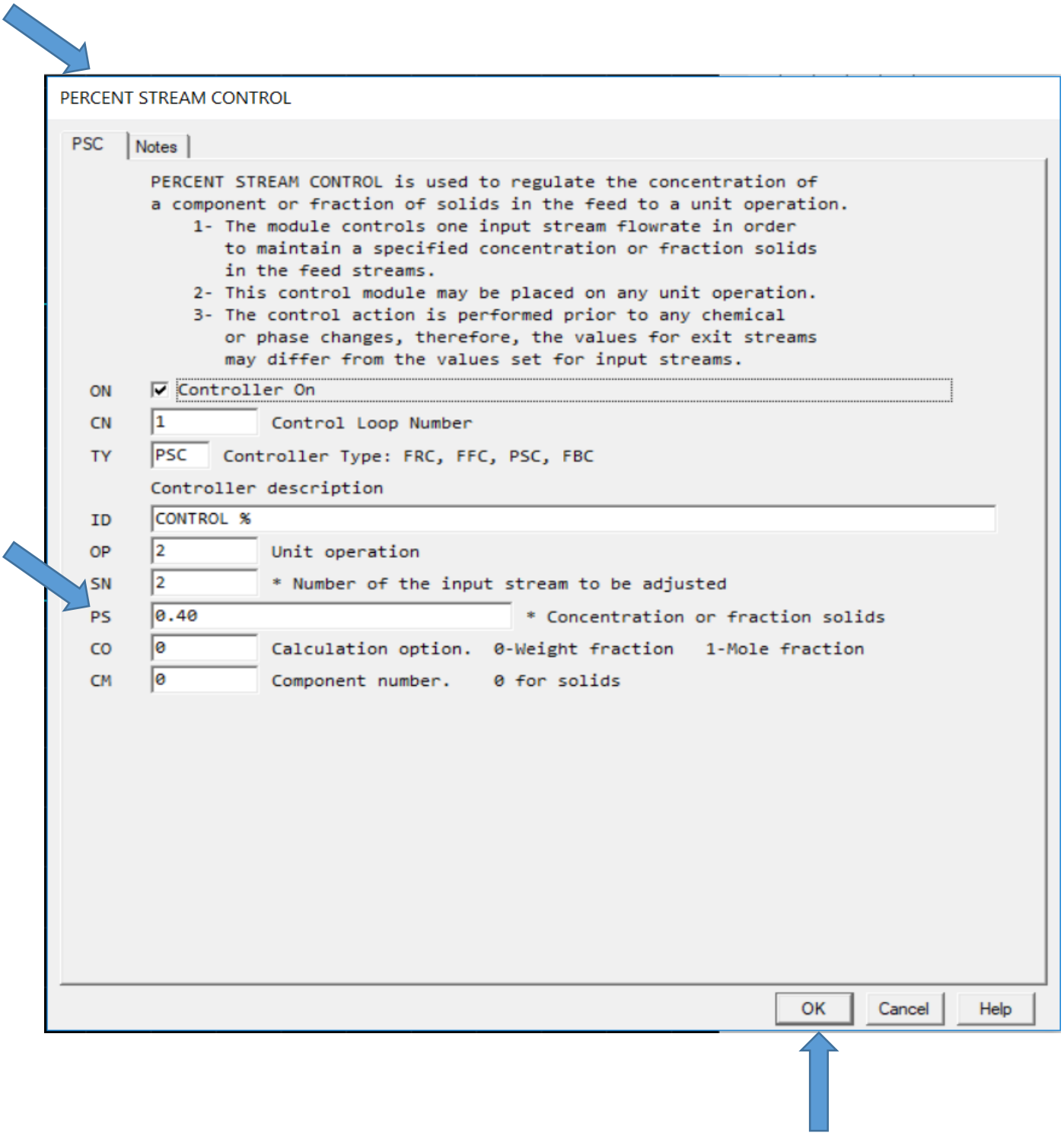


Add Instruments & control to achieve 40%

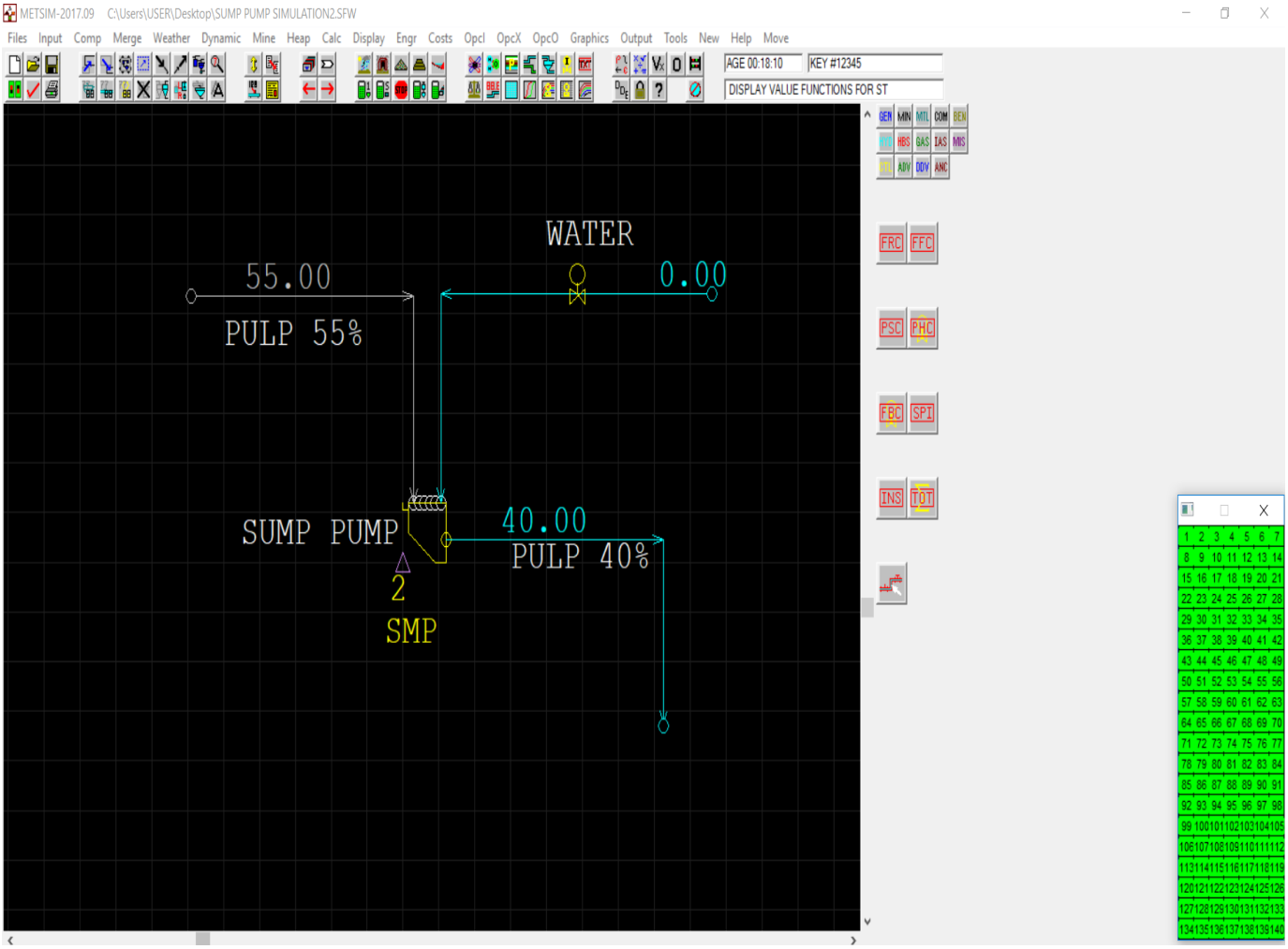




- From the CTL tab, add percentage stream control “PSC” and configure as below.



Run the model and observe how your model ….



DISCUSSION POINTS

Did you achieve the desired parameters?

What have you learnt about controls?

How much water is needed to form the desired pulp?

Repeat the procedure to achieve a pulp of 70% solids (SIO2)