

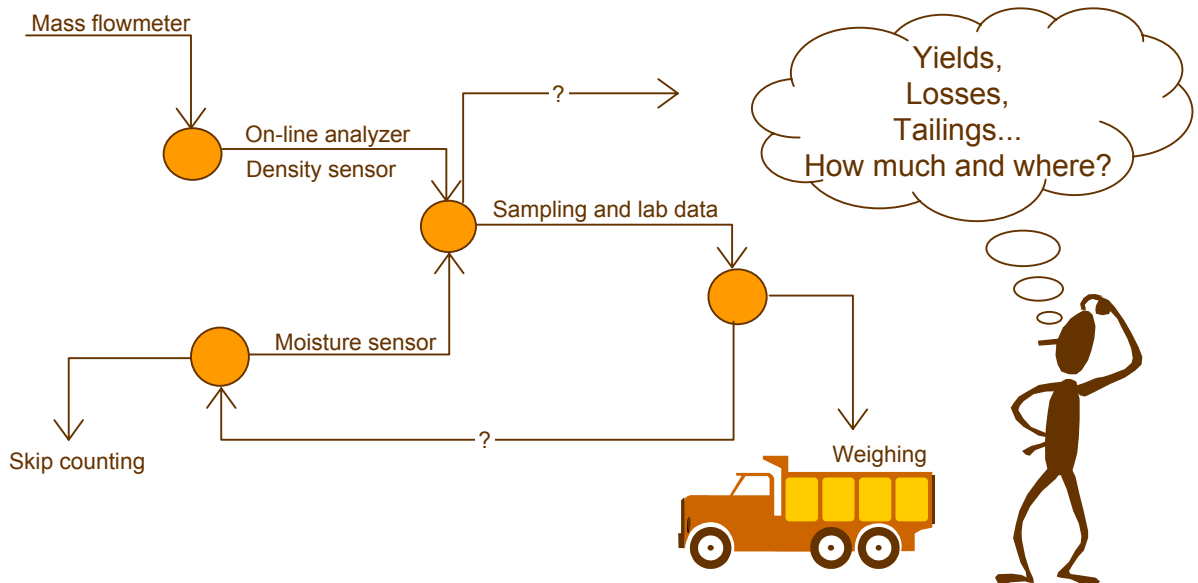
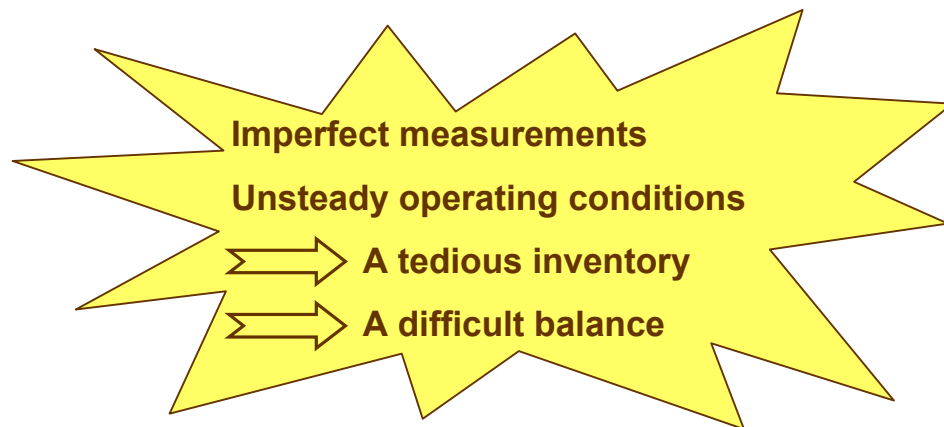


Serving your process needs

Caspeo™ adjusts your material balance

You equilibrate you financial balance?

Why not your material balance?



Caspeo offers you a solution

Caspeo™
✉ BRGM Campus
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45060 Orléans Cedex 2, France
www.caspeo.net



Material balancing: a production tool

A solution based upon the BILCO™ software

Principle

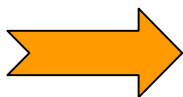
- To derive a coherent material balance from all the available data (measurements, analyses, estimates) for all the process streams

Results

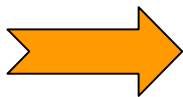
- Coherent and more reliable data
- Non-measured data availability
- Validated operating parameters



Benefits



Productivity improvement due to a better process management



Increased reactivity thanks to reliable and correlated performance indicators

Application fields

- Production snapshot
- Water balance
- Estimation of losses
- Supply validation
- Discharge quantity and quality evaluation
- Intermediate inventory assessment



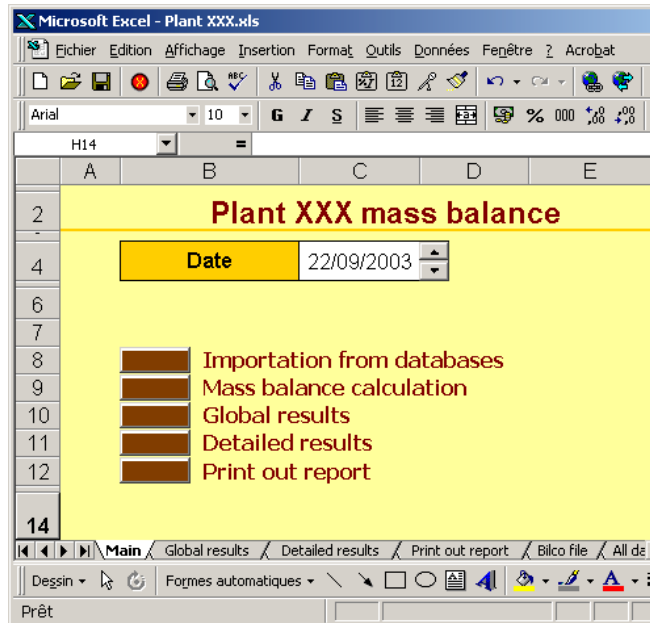
A complete range of services

From preliminary audit...

- Operation review leading to recommendations on measurement, sampling and data management

... to the installation of on-line material balancing systems,

- Interfacing of the BILCO software with data acquisition systems and/or laboratory databases
- Development of databases
- On-line determination of operating parameters such as residence time, yields, grades, consumption.



Mass balance - Process parameters			
septembre 22, 2003			
Reactors			
From Feed tank			
Feed rate	167.90 tpd		7.00 t/h
% solids	54.87 %		
Co	1.37 %		
S	40.75 %		
Co	0.28 gpl		
SO4	15.85 gpl		
Cobalt Contained in Feed	2.33 tpd		97.19 kg/h
Primary reactor feed			
% solids	18.09 % solids		
Co	1.39 %		
S	38.24 %		
Co	2.67 gpl		
SO4	26.11 gpl		
Limestone addition			
Feed rate	68.58 tpd		2.86 t/h
% solids	47.9		
Maximum CO2 available in reactors	17 256 m3/d		719.01 m³/h
	28 t/d		1.15 t/h
Residence time			
In primaries	4.49 days		
In secondaries	1.45 days		
Sulphide oxidation rate			
	82.24 %		
Recovery of Co in solution			
	78.95 %		
Gas balance			
Air feed rate	53229.77 m3/h		
Average per reactor	13307.44 m3/h		

going through

- Training of the production management team
- Customer tailored solutions

and much much more...



BILCO™ a multi-field tool

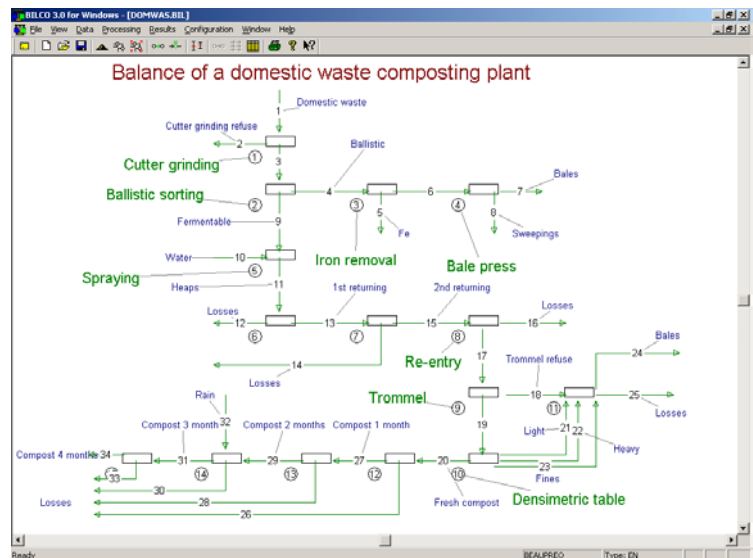
Caspeo offers you a complete data analysis system by material balance based on the BILCO™ software.

BILCO is a BRGM tool. It is an interactive, quick and statistically accurate software for solving material balance problems in a vast number of applications. BILCO can also handle all types of balancing problems that involve chemical analysis (fitting up to 100% and estimating accuracy of analyses), mineralogy (fitting with chemistry), planning sampling strategies, mixing and blending and more

BILCO 3.0 can communicate with most applications using a COM (Component Object Modeling) interface.

The COM interface can be used to:

- automate data import and export, e.g. transfer some experimental values from an Excel spreadsheet to BILCO, then calculate the material balance and transfer results from BILCO back to another Excel spreadsheet
- link several material balance calculations for sensitivity analysis (effect of experimental values and errors on material balance results)
- improve the quality of real-time process data through automatic material balance calculation



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