Increasing the value of the asset with digital solution

How to manage a modern continuous mine closure process

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Gaël Bellenfant in The Team

- GTK: Finnish Geological Survey, Finland
- **BRGM: French Geological Survey, France**
- DMT GmbH & Co. KG – Civil and Mining Engineering, Germany
- M Solution: ICT services&solutions, Finland
- Hannukainen Mining: Mining company, Finland

- Engineer in geology, pHD in Geotechnics & environment (waste management)
- At BRGM since 2006
- Post Mining Coordinator in charge of research, public and international projects in post-mining

ClosureMatic Team in France (2019)

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What do the mining industry need ? → HOW TO ?

...write the CMP ?

continuously updated

Standard way

...keep the memory of the documentation ?

Ownership and team changes

...monitor the closure actions ?

What?
Where?
Why?
Who?
When?
How Much ?

(responsibilities, % of completion, costs?)

...report ?

internally and externally

Standard way

...improve social acceptance ?

17 PARTNERSHIPS FOR THE GOALS

follow the respect of stakeholder engagement

...manage the closure liabilities and uncertainties ?

ENTER AT YOUR OWN RISK

transfer of ownership

1 ETHICAL BUSINESS | 2 DECISION-MAKING | 3 HUMAN RIGHTS | 4 RISK MANAGEMENT | 6 ENVIRONMENTAL PERFORMANCE | 7 CONSERVATION OF BIODIVERSITY | 8 RESPONSIBLE PRODUCTION | 9 SOCIAL PERFORMANCE | 10 STAKEHOLDER ENGAGEMENT

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What do we bring ?

- A digital solution for a permanently up to date CMP
  - Management of user profiles
  - A Closure Management Plan (CMP) structure **tailored to the user**
  - A template system to:
    - edit the content (text, pictures, tables)
    - find guidance
    - link documents
    - create closure actions
  - A **real time visual monitoring system**
  - GIS interface
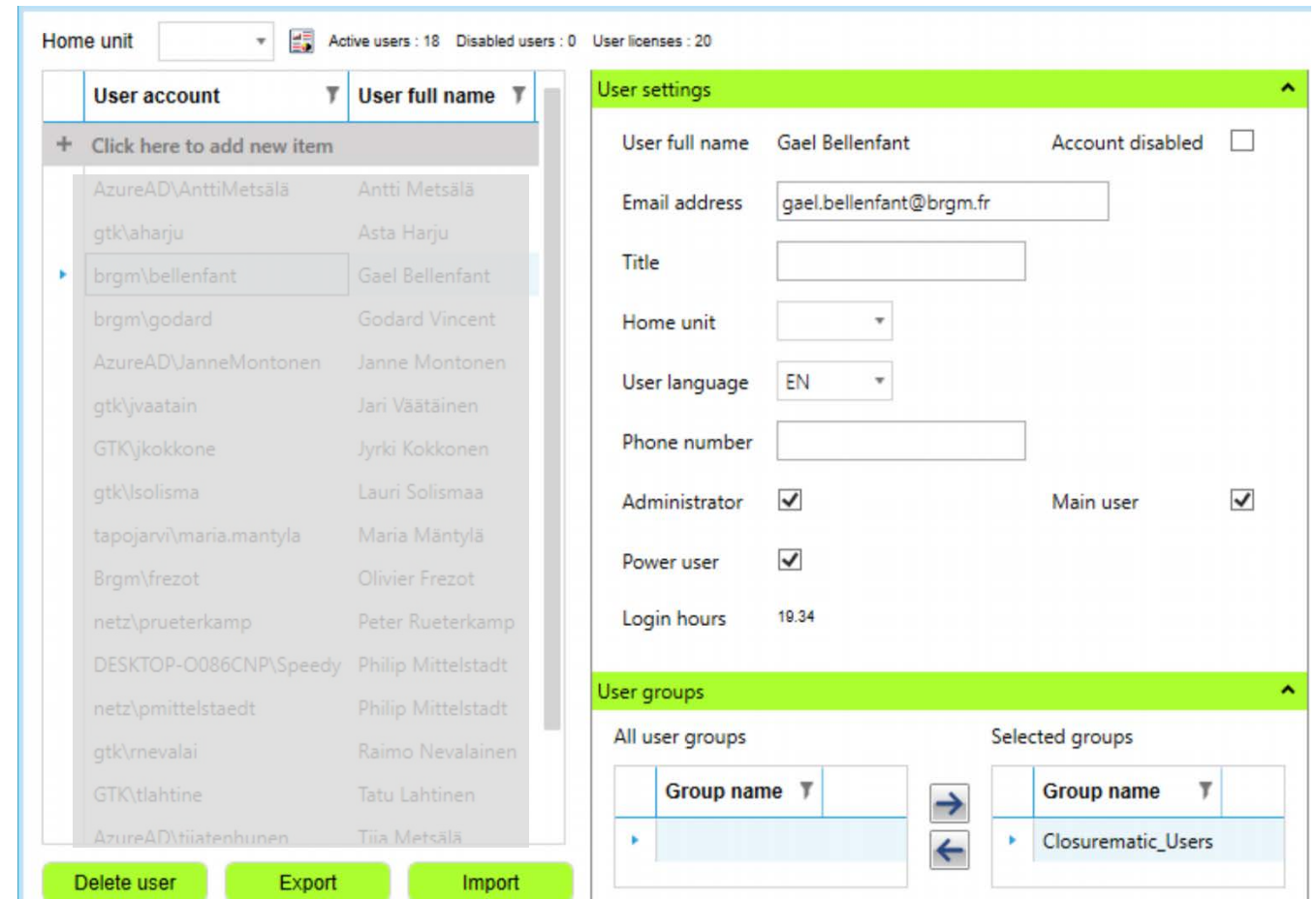 - Click and print/**share**
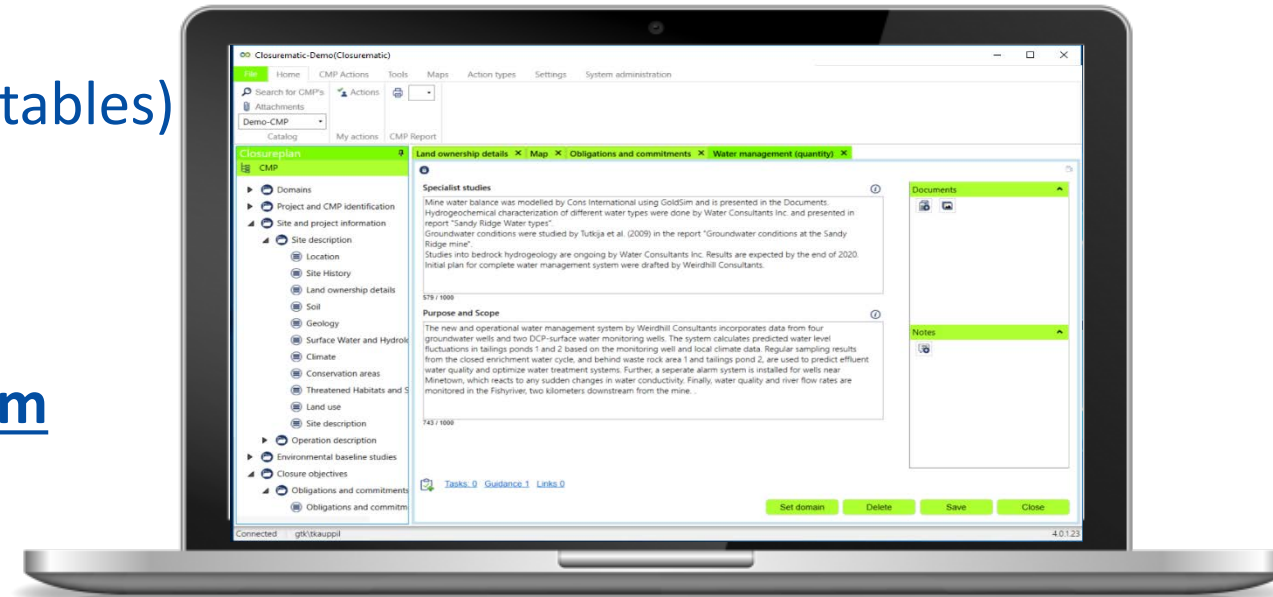
Management of user profiles

Internal users:

- Administrator
- Managers
- Operators

External users:

- Consultants
- Visitors

Adaptation to the user's organisation

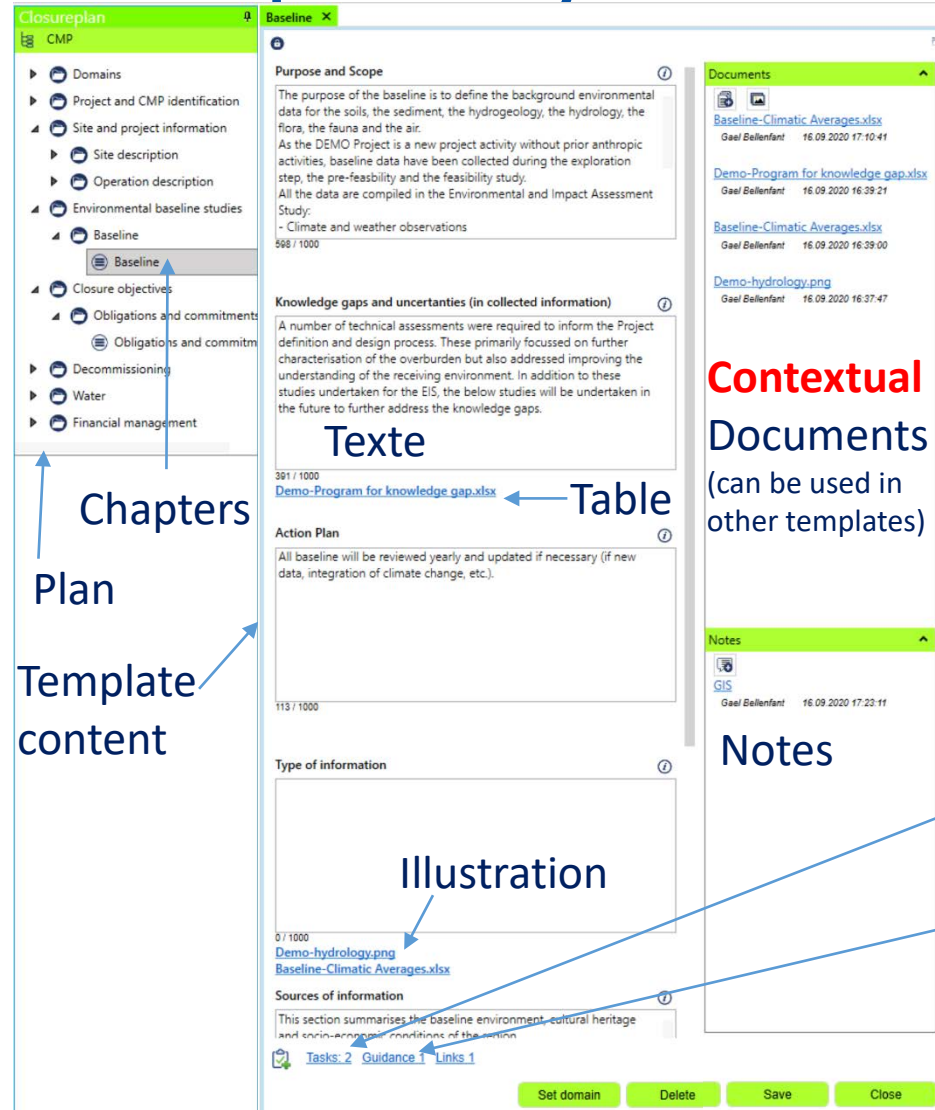# Tailored Closure Management Plan Structure
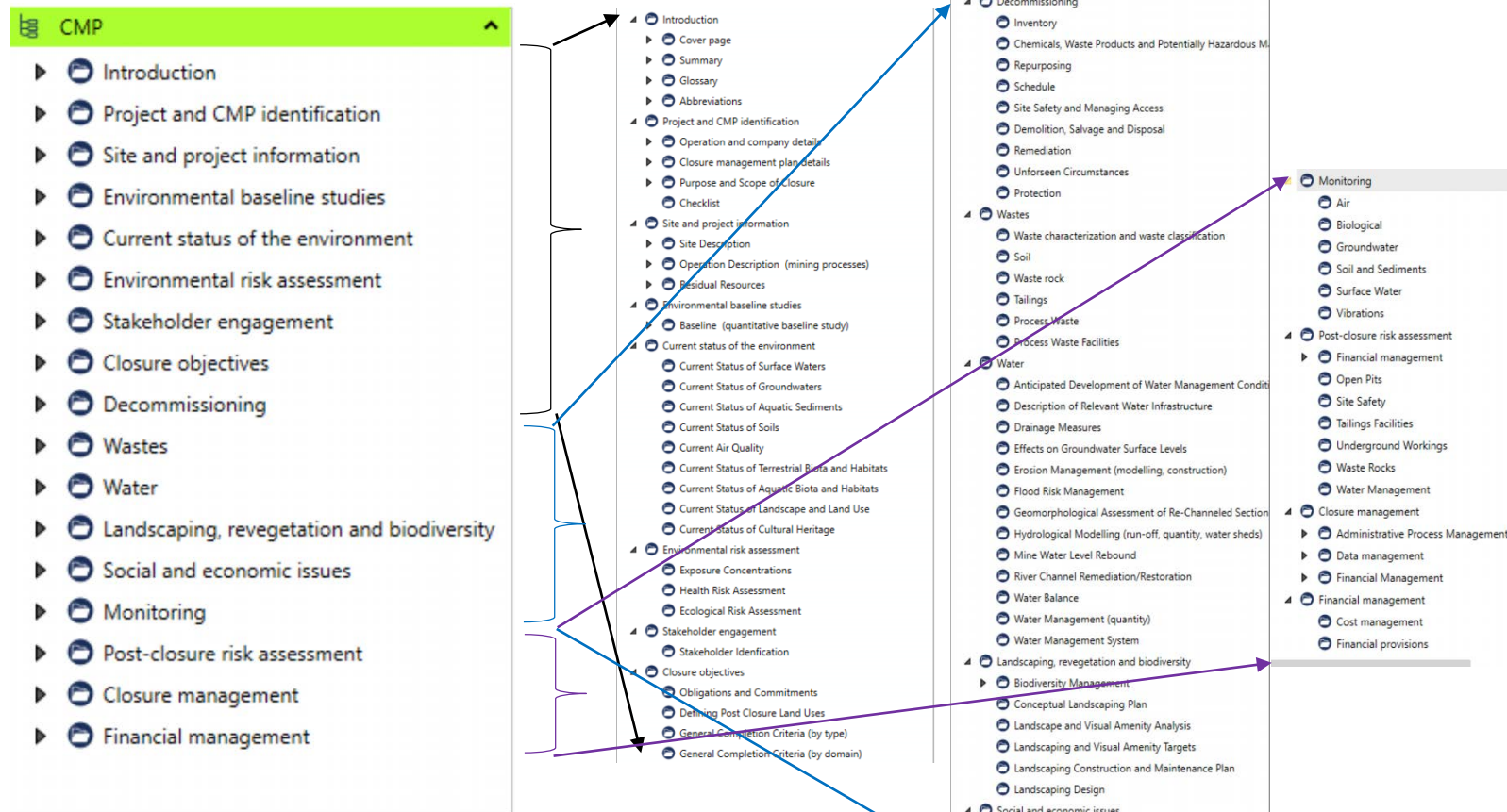
Save/edit/reuse Table of Content

To adapt the structure to:

- Mining group standard

- Administration requirements

- Project specificities (open pit, underground works, radioactive wastes…)

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A template system with guidance, actions, documents

facilitating filling the information in each chapters /sub-chapters (texts, illustration, tables, references)

Chapters
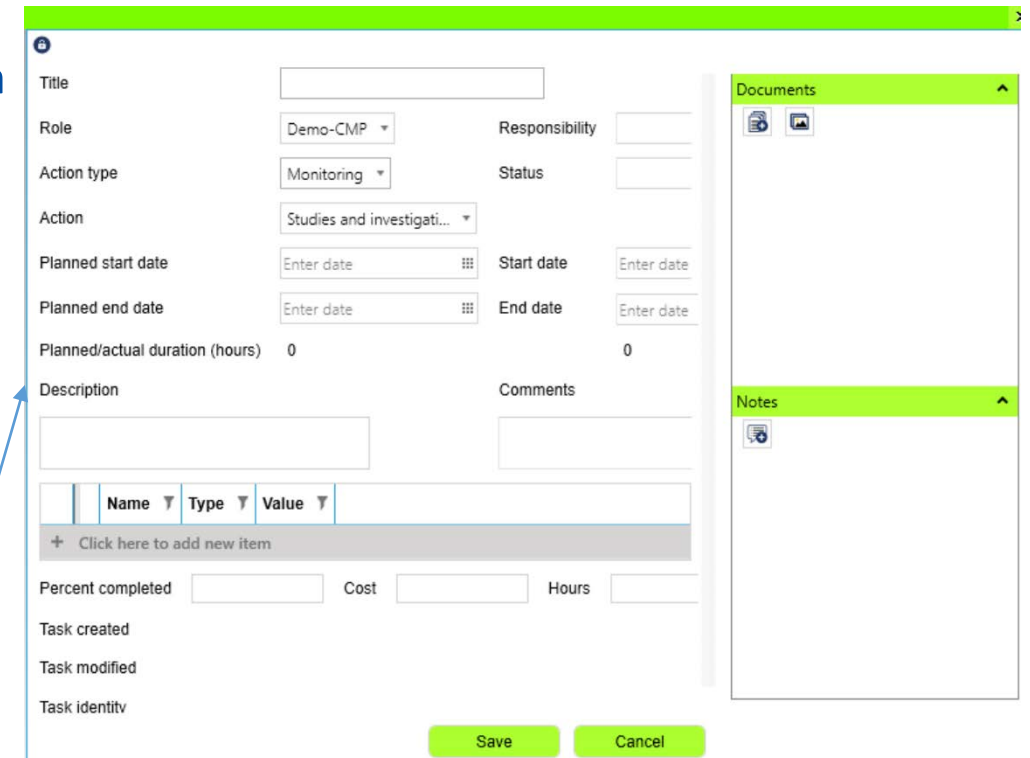
Plan

Template content

Texte

Table

Illustration

Guidance

Contextual
Documents
(can be used in other templates)

Notes

Tasks/actions

Type of action
Responsibility
Dates
Cost
Completion

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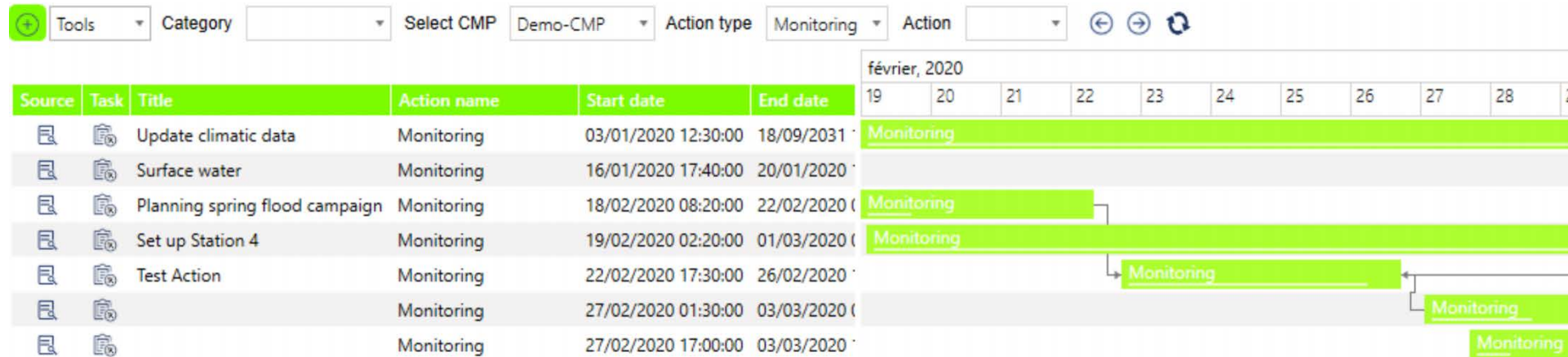
A real time visual monitoring interface

- **Monitoring** of actions/costs

Visualization of cost/progress per:
- type of action
- Domain
- Thematic
- Domain
- Responsibility

Graph (table / pie chart / ...)

Export on Excel

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Transition: The Domains

Domain 0 = Whole site env & social footprints
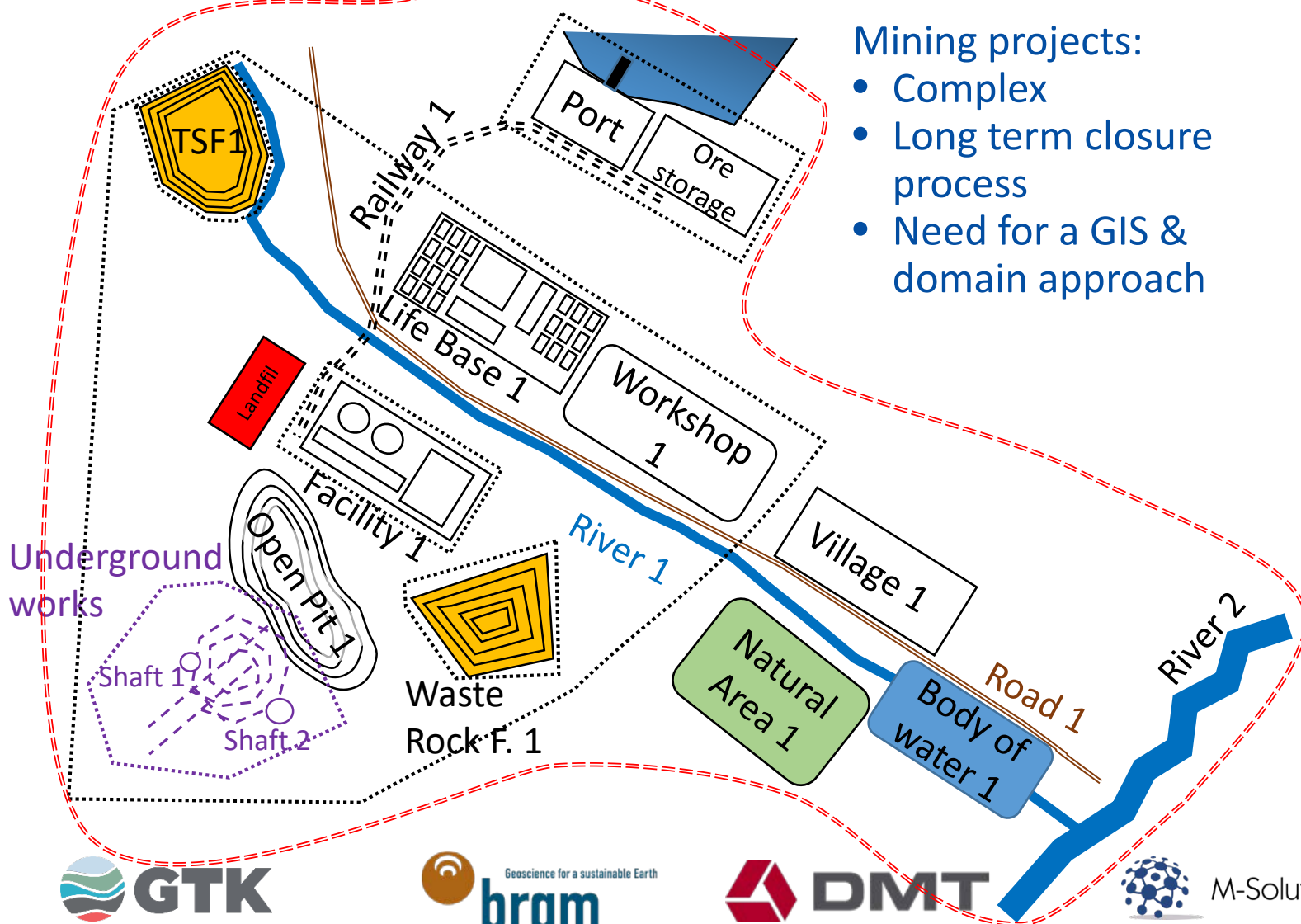
Mining projects:
- Complex
- Long term closure process
- Need for a GIS & domain approach

Domains panel:
- Name: Wasterock 1
- Number: 1
- Decription: Wasterock facility
- Final land use: Wasterock area, revegetated to recreational forest site
- Obligations: Cover structures to make the facility non-polluting, revegetation
- Planned completion: 17.09.2020 16:00
- Documents
- Notes
- Header/Details
- Delete | Save | Close

For each domain:
- Land Uses
- Closure objectives / Completion criteria
- Impacts
- Monitoring
- Rehabilitation Programme

Each template (part of the plan) is associated to a domain
→ So are each closure actions
→ reporting /domain

Map labels: TSF1, Railway 1, Port, Ore storage, Life Base 1, Workshop 1, Landfil, Facility 1, Open Pit 1, River 1, Village 1, Underground works, Shaft 1, Shaft 2, Waste Rock F. 1, Natural Area 1, Body of water 1, Road 1, River 2

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GIS Interface (domain management) For each domain:

Import/drawn shapefile

Visualize

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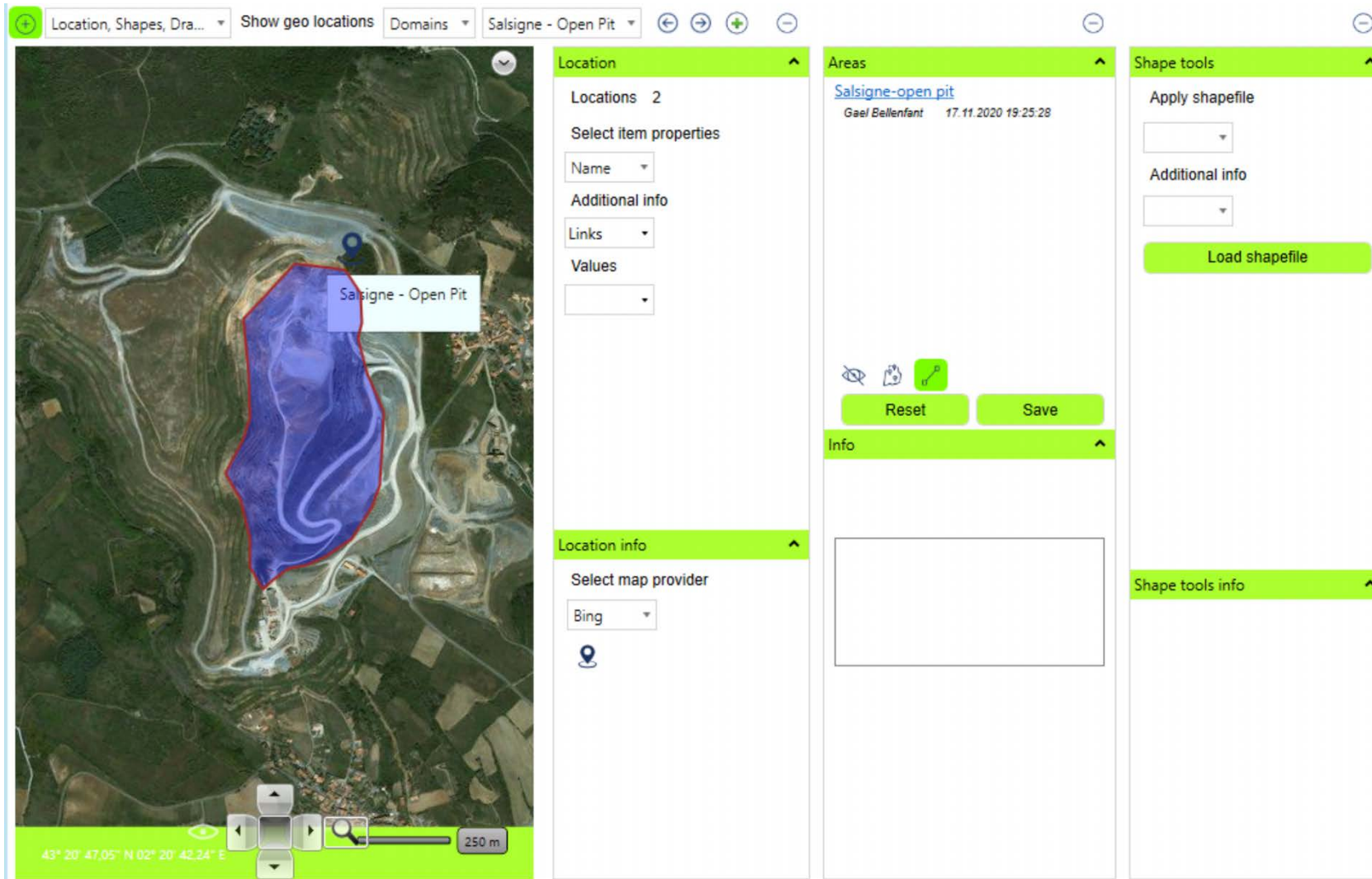
Printing and Sharing

- Click and **share** (for example to put online the last public CMP, or specific data)
- Click and print (for example to print the last version of the CMP to the authorities)

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A digital solution to increase your mine value

Efficiency:

- **Time optimization** to update/share MCP (continuous updating, contextual help, guidance and internal documentation)

- **Reduce "Brain Drain"** in case key personnel leave the company

- **Transparency** in the responsibilities

- **Improved management** of the consultant's contributions

Reliability and cost:

- Improved technical **Due-Diligence outcomes** of your **asset** for e.g. investment, merger or acquisition purposes (ownership transfer → transfer of the digital solution → knowledge and all the data transfer)

- Better control over the **liabilities** and **knowledge gaps**

- Highest degree of **environmental and social success,** usually at a **lower cost** due to a better planning

Transparency and Trust:

- Better integration of **objectives and commitments**

- Increased **compliance** to local, national and international standards and regulations

- Better **reporting** to the stakeholders (governments, population, funders)

- Improve the SLO situation

Keeping the control of the digital system

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Thank you.

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ClosureMatic Team in Finland (2018)

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