

KELIBER, Water Management



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KAIVOSVESIVERKOSTO MATCHMAKING
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High purity lithium carbonate

Targeting fast growing lithium-ion battery markets

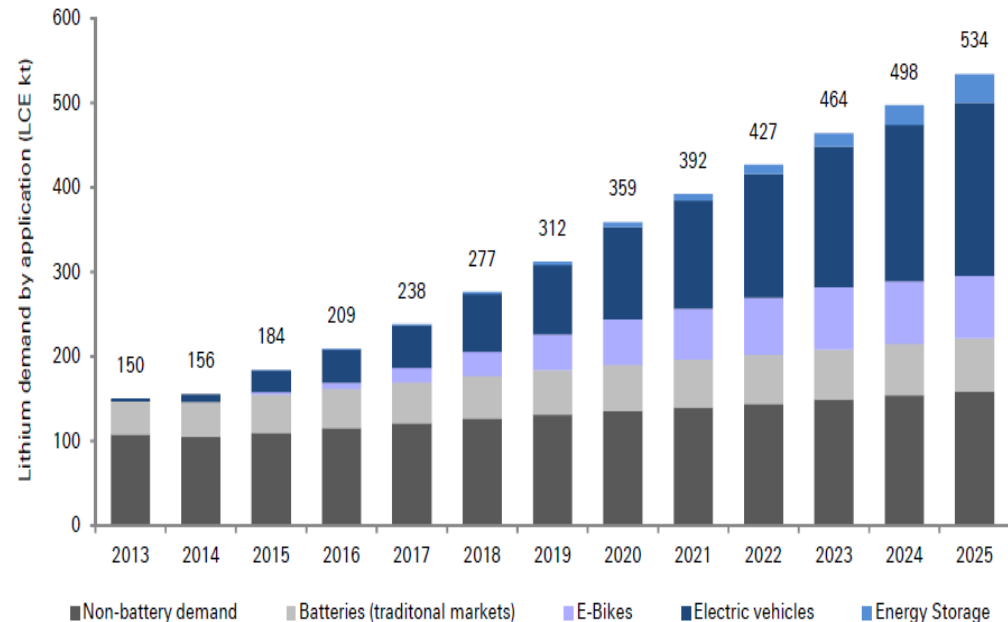
- **Target to be the first lithium producer in Europe**
 - EU is the second largest market for lithium 21 % of total world wide consumption in 2015
- **Good infrastructure**
 - A good access to power and water, no large investment needs for transportation infrastructure
- **High quality end product**
 - Target to produce battery grade (99,5 %)



Increasing demand for lithium

Towards mobile and more sustainable world

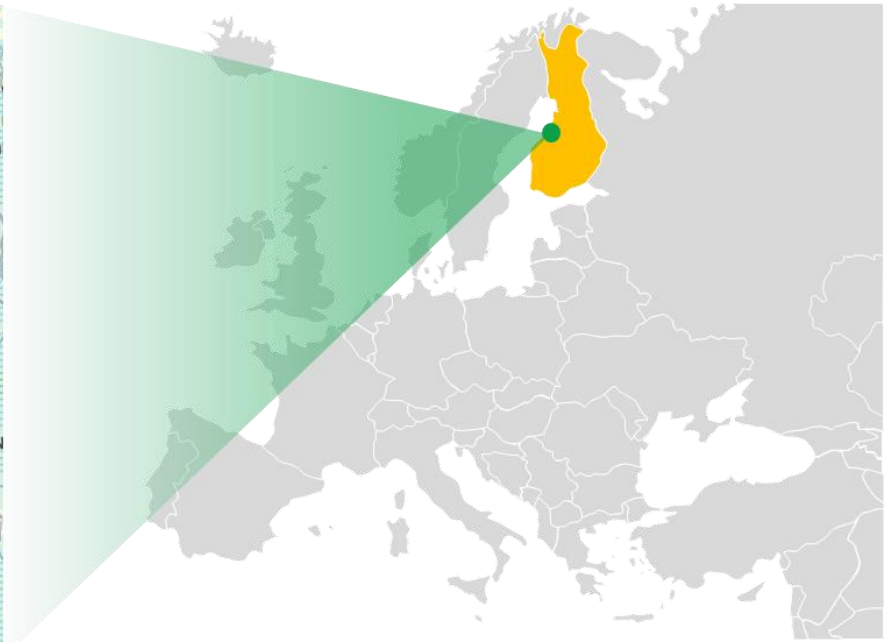
- Increasing demand for Lithium-ion batteries
 - mobile electronics
 - portable hand tools
 - hybrid and electric vehicles
 - stationary grid batteries
 - stationary home batteries
- Annual global lithium demand is forecasted to almost triple from 184 000 tons in 2015 to 535 000 tons in 2025 (Deutsche Bank, 2016)



Ideal geographical location

Mining friendly jurisdiction and strong infrastructure

Keliber production plant and key transport hubs



- Well positioned for European markets
- Strong, existing infrastructure
- Valid permits, claims and reservations

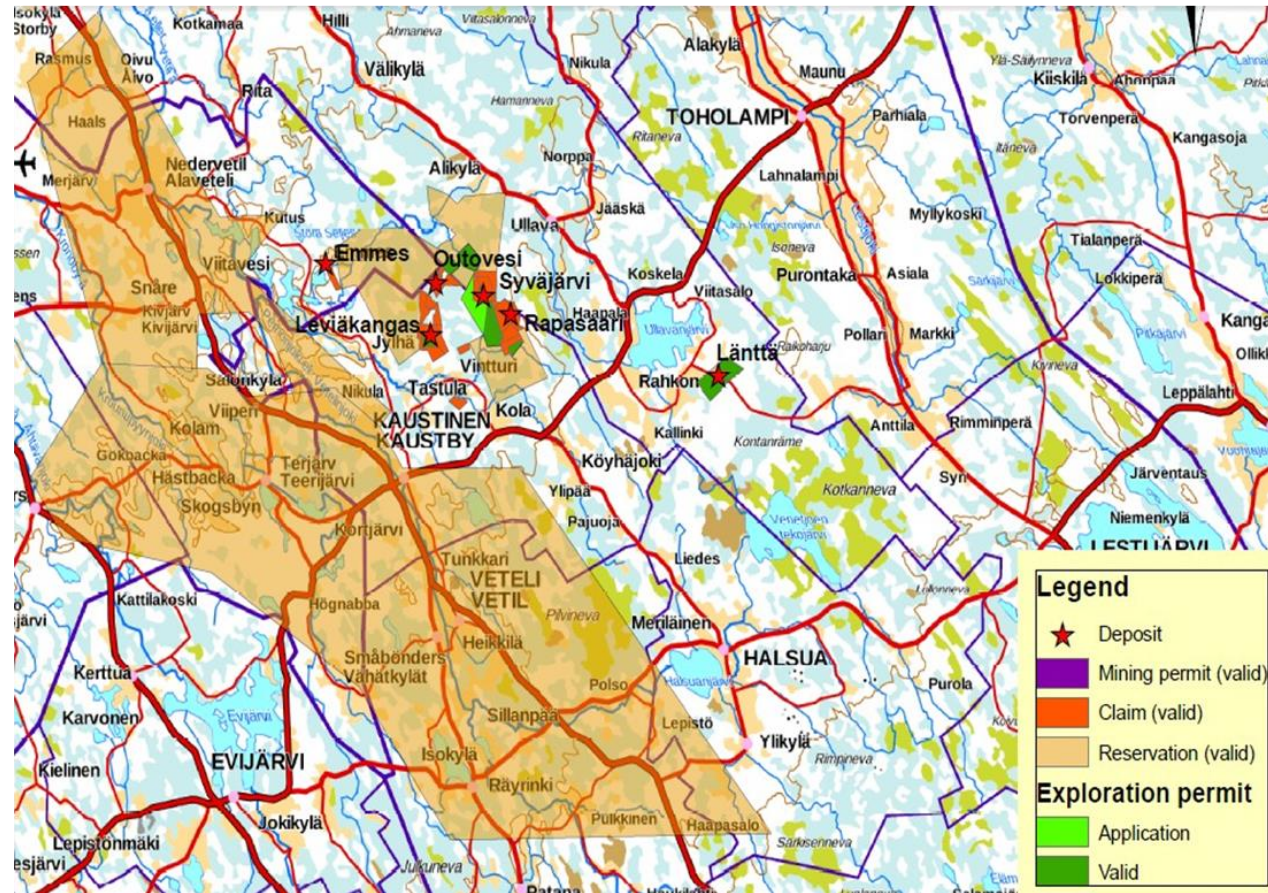
★ Port of Kokkola ★ Railway station ★ Airport ★ Production plant

Excellent exploration potential

One of the most significant lithium-bearing areas in Europe

Overview of concession areas

- The lithium-rich province of Central Ostrobothnia covers over 500 sq. km
- A number of unexplored areas and excellent potential for further discoveries
- More than 1400 erratic boulders in the area



Strong commitment to environmental responsibility

Valid environmental permits and ongoing EIA processes

Key environmental aspects

- Valid environmental permit for Lanttä deposit and Kalavesi production plant
- EIA process ongoing for four deposits
- EIA process ongoing for Kalavesi production site
- Pre-negotiation procedure granted by authorities enabling smooth and quick environmental permitting process
- Protection of Moor Frogs and Golden Eagle
- Minimizing damage to the environment
- Operations in a sparsely populated area

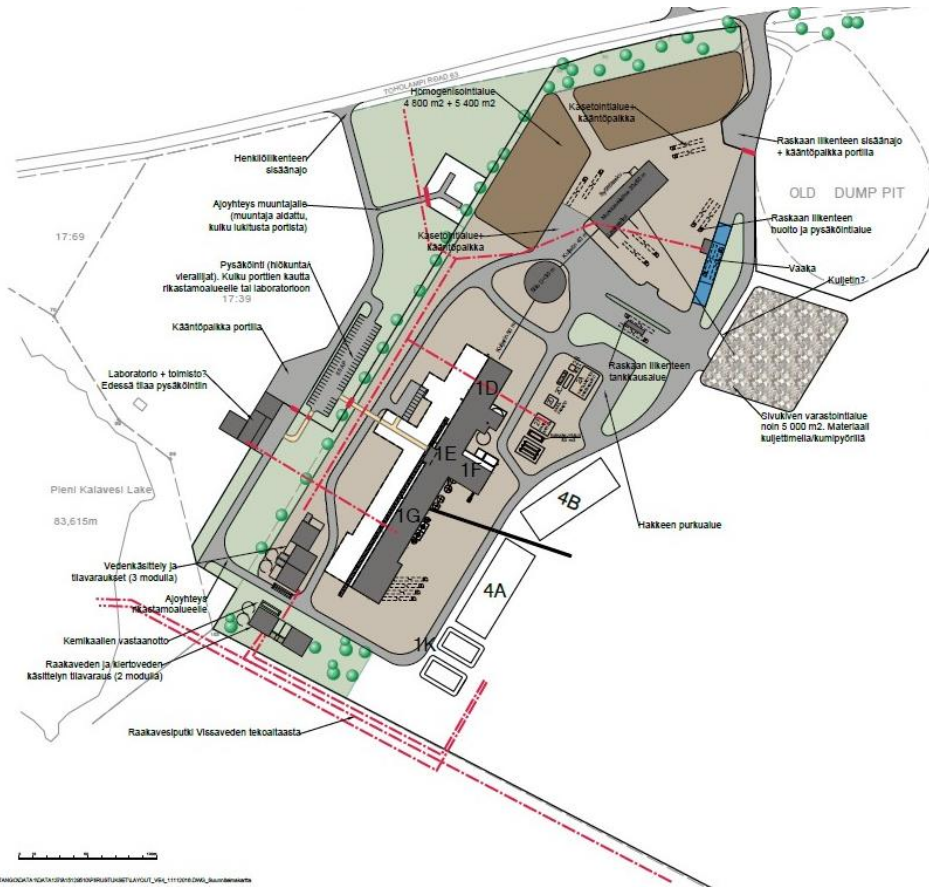


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Mines and production plant

Easy access between sites

Overview of mines and production site



- Short distances between sites
- Production site has good existing infrastructure (water, sewage, power and electricity)
- No restrictions on layout planning

Project timeline

Definitive feasibility study and preparation for production

Tentative timeline for the next stages (2016-2020)

- Definitive feasibility study on-going
- Basic engineering to begin soon
- EIA and permit processes are ongoing
- Further drilling and exploration 2017–2018
- Construction to be completed in 2019

Production estimated to start late 2019

Task	2017					2018				2019				Q1
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
DFS	██████████													
Basic Engineering		██████████												
Detailed Engineering and Further Development			██████████											
EIA	██████	★	██████	★★									
Permitting	██████████			★				★★					
Resource Drilling and Exploration	██████		██████									
Construction									██████████					
Production														██████

Filing the EIA to the authorities ★

Statement from authorities ★★

Filing the permit applications to the authorities ★

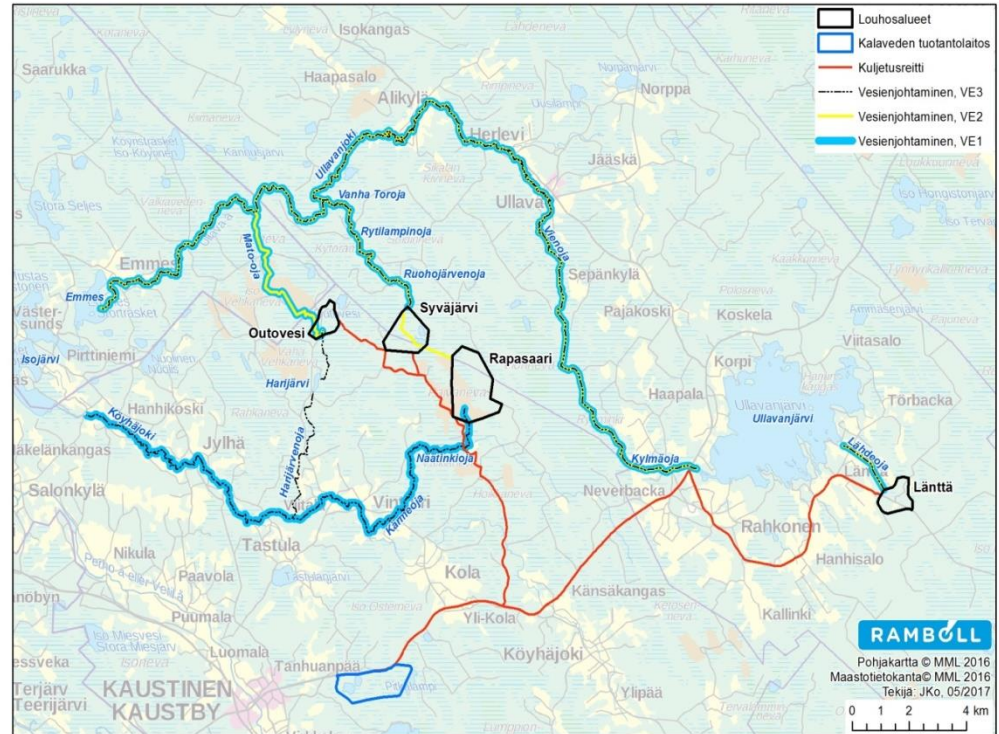
Decision from authorities ★★

Mine sites

Water management and road connections

Overview of waters and roads on area

- EIA – report will be completed in June 2017
- EIA -report includes four deposits
 - Syväjärvi
 - Länttä
 - Outovesi
 - Rapasaari
- The distance between mine sites and the Kalavesi production site is about 15 – 25 km
- Mine sites waters are not connected to each other and not connected to the Kalavesi production site



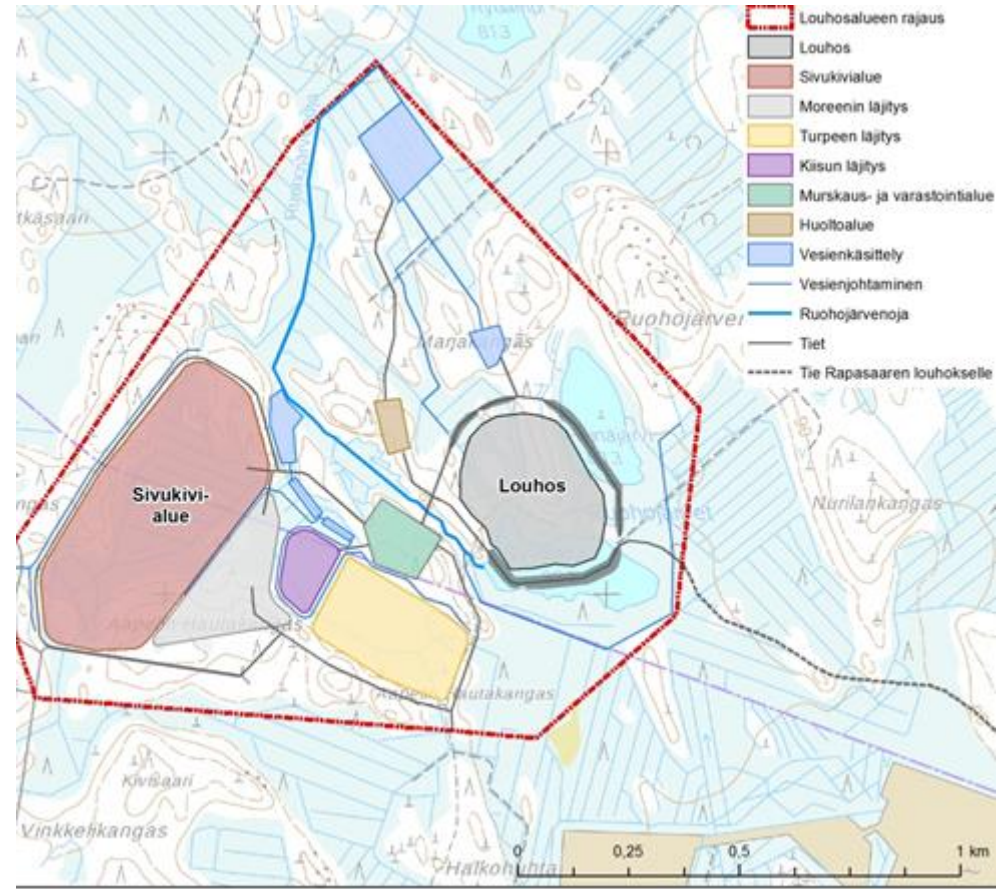
EIA process for the mine sites completed by the end of 2017

Syväjärvi Mine Site

Water management

Basis for the water management designing

- Syväjärvi deposit is located under the lake Syväjärvi and lake Heinäjärvi
- Open pit mining, about 100 m deep pit, Mining operations takes about 4 to 6 years
- The lakes are dewatered during the mining operations, dewatering plan was made in 2015 by FCG
- Water treatment structures are settling ponds and overland flow areas
- Study of Bedrock groundwater discharge at Keliber Oy planned Syväjärvi Mine was made in 2017 by GTK

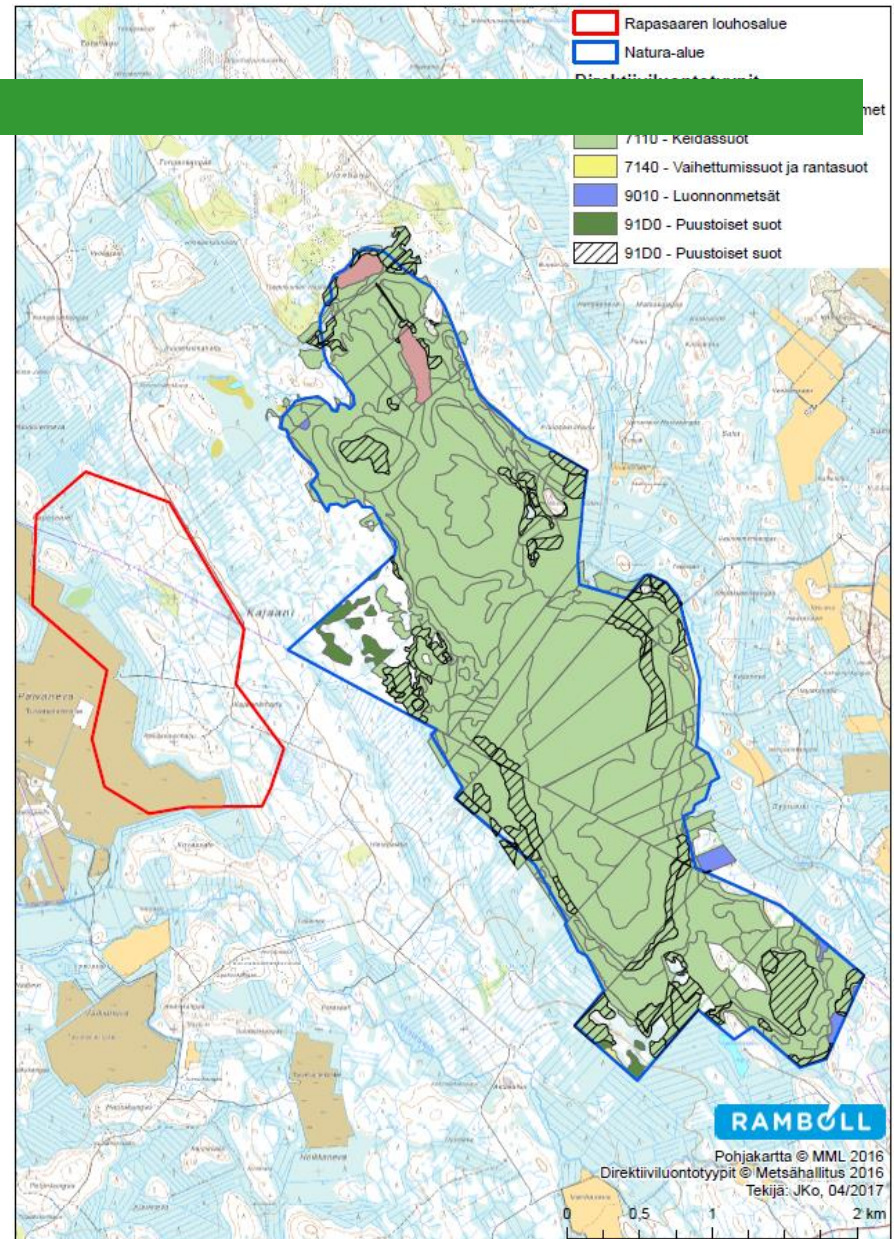


Rapasaari Mine Site

Water management

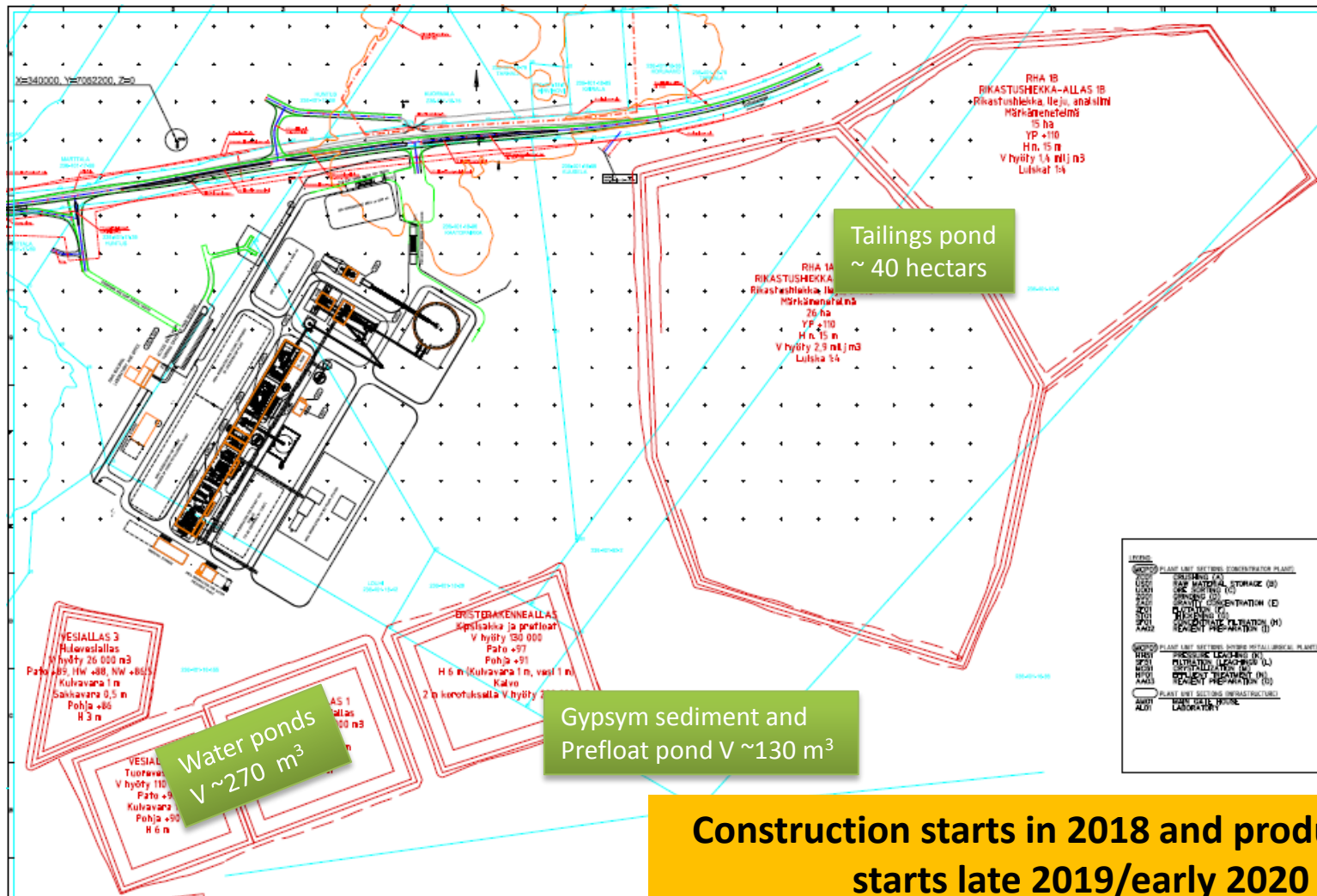
Basis for the water management designing

- Rapasaari deposit is located near (400 m) Vionneva Natura2000 area
- Study of Discharge and Flow of Bedrock Groundwater from Vionneva Natura 2000 Area to Rapasaari Quarry (GTK 2017)
- Open pit mining, about 100 m deep pit, mining operations takes about 4 to 6 years
- Water treatment structures are settling ponds and overland flow areas



Kalavesi production site

Spodumene concentrator plant and chemical plant in the same site

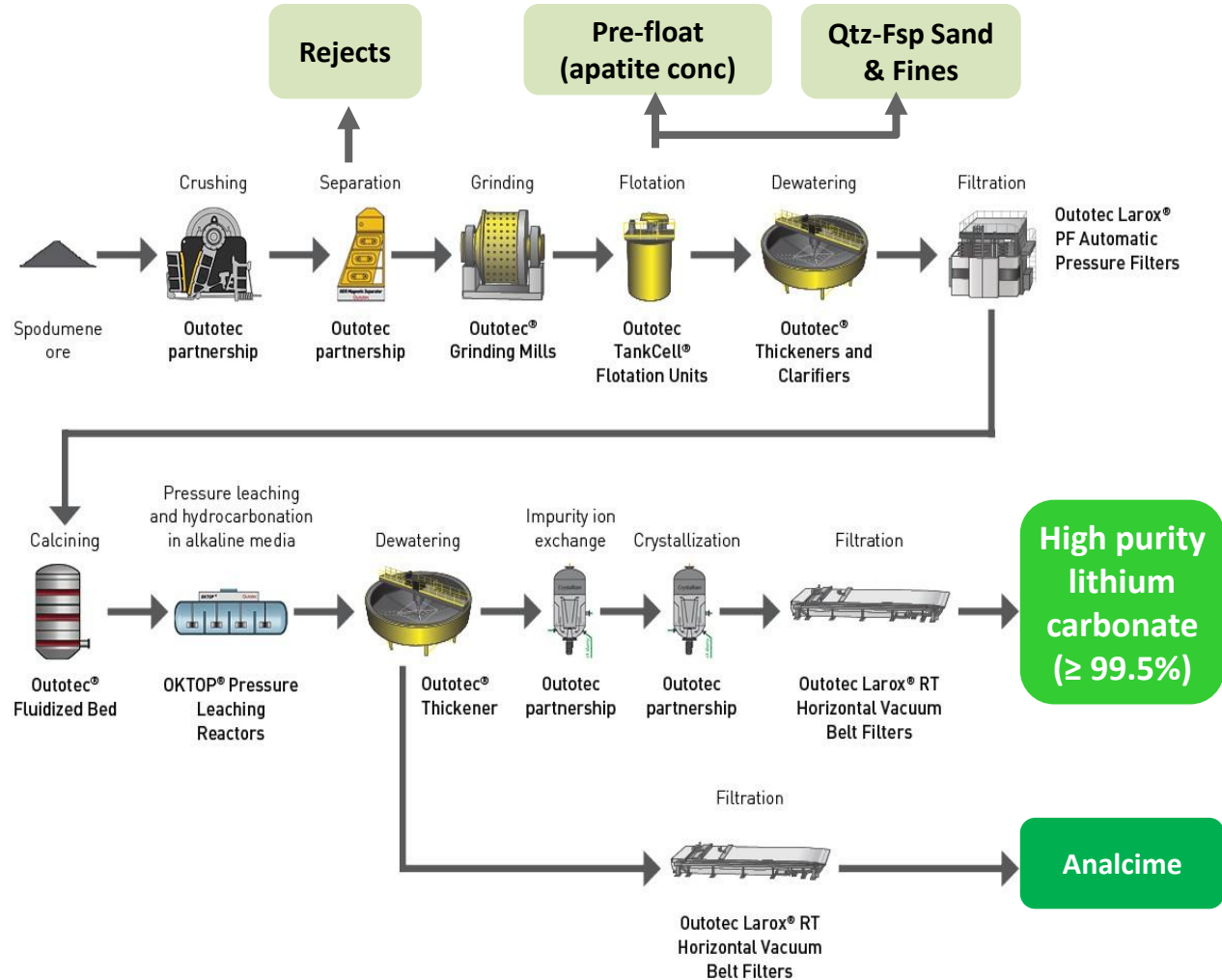


Construction starts in 2018 and production starts late 2019/early 2020

Innovative process

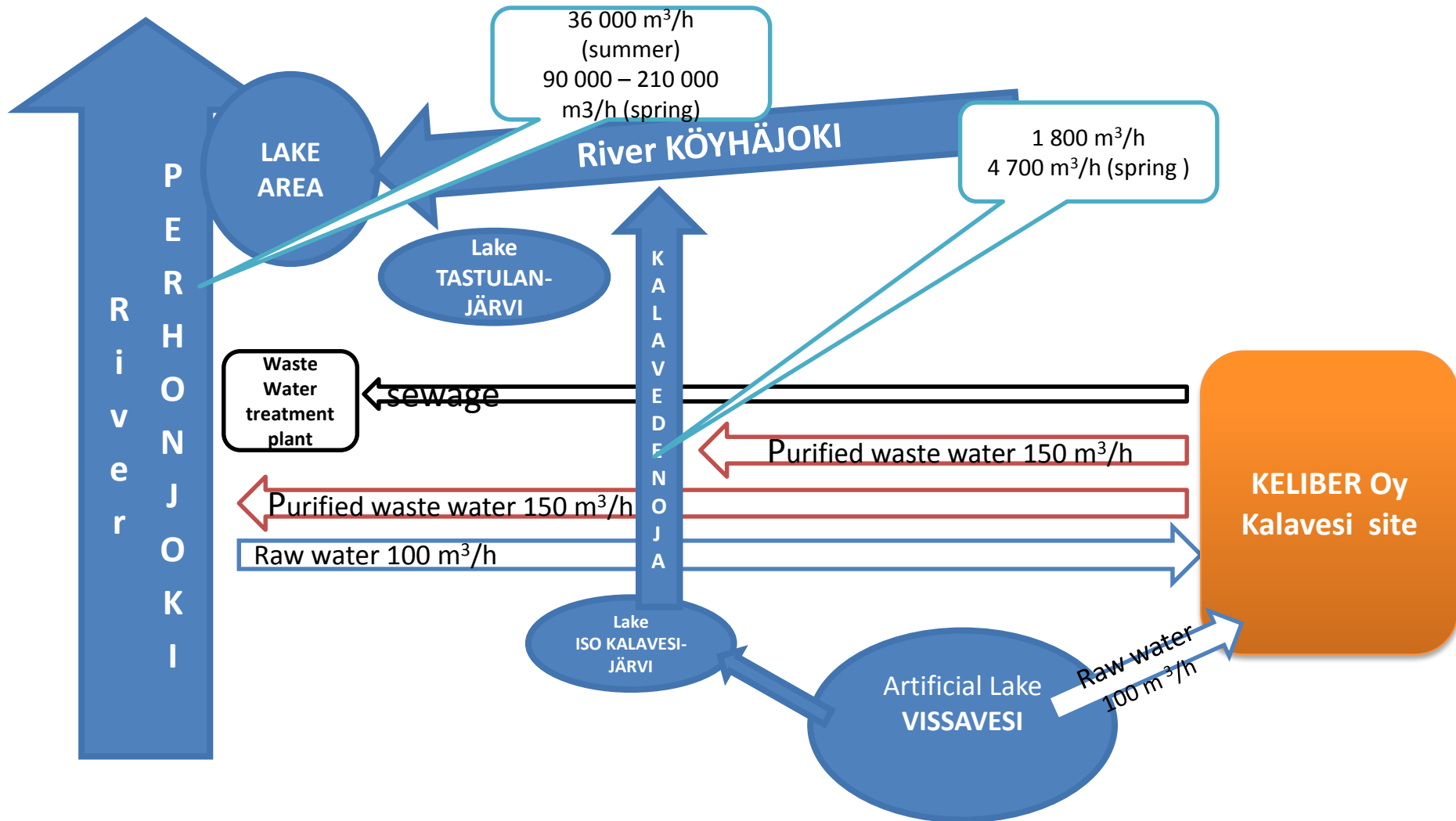
Efficient and environmentally sound production of high purity lithium carbonate

- Optical sorting
- Valuable by-products
- Concentrate grade optimization
- Flexible and environment-friendly soda leaching
- Tailings with no heavy metals nor acid generating minerals



Water management in Kalavesi site

Tentative water management plans



Golden Eagle “Spodu”
Age 28 years, oldest in
Finland.
He has nested
successfully in past two
years in Vionneva
artificial nest, which we
made in late 2014



Thank you

