7. BEST KEMI

FAIRWAY partner: Rikke Krogshave Laursen (SEGES, DK)

Brief description	
BEST Kemi is a groundwater chemical management and forecasting DST providing an overview (screening) of the concentrations of nitrate and pesticides in the groundwater. Additionally, it can be used to monitor/follow the state and trends in the groundwater quality. BEST Kemi is a part of the BEST Portal which includes several DSTs e.g. a DST to check the groundwater utilisation ratio on a municipal level.	
Contaminants covered (e.g. nitrate, pesticides etc.)	Nitrate, pesticides
Intended end users (e.g. farmer, water quality manager, policy maker)	Municipality, water works
Level of expertise and/or training required	Trained personnel
Geographical resolution (e.g. field, catchment, national)	Municipality level
Temporal resolution (e.g. daily, annual, long-term).	Varies depending on the available data (water analyses) from the monitoring program established for the water well.
Real-time component (e.g. live weather data, soil moisture data feeds etc.)	Data input to BEST Kemi comes from the national GEUS Jupiter database, which register all well information including water quality data.
Number and type of mitigation measures included	Controls that the concentration of pesticides and nitrate is below the drinking water quality threshold values (50 mg/l for nitrate and 0 µg/l for pesticides).
Platform (e.g. paper-based tool, phone app, bespoke software).	IT solution in Danish. A municipality has its own bespoke software.
Frequency of updates	Daily
Cost/availability	Commercialised software
Number of users or number of copies distributed/ downloaded/purchased	The BEST portal is applied by 34 municipalities in Denmark (98 municipalities exists). Only 3 municipalities have BEST Kemi (it is still a relatively new DST)
Links to demo material and other relevant information (e.g. user guides).	Information regarding the BEST portal and BEST Kemi is written in Danish and is not public available. https://www.niras.dk/ydelser/vand/grundvand/
Additional comments	

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Input data required to run the DST	Required data input comes from the national GEUS Jupiter database, which register all well information including water quality data.
Outputs (including links to water quality and economic or financial aspects)	Concentrations of, among others, nitrate and pesticides (state). Trend analysis.
Age/provenance of supporting data used to develop the DST	Varies depending on the available data (water analyses) from the monitoring program established for the water well.
Country-specific calibration or data requirements (including restrictions on use)	Yes. BEST Kemi is specifically set up for a municipality. A database like the national GEUS Jupiter database must be available.
Details of validation and testing	The applied water quality data is based on water analyses. If a water analysis contains nitrate and/or pesticides above the drinking water quality threshold values another water sample is analysed. There is no validation or testing within the DST.
Date developed/released (or planned release date)	The first DSTs in the BEST Portal were released in 2011. BEST Kemi was released in 2017.
Author/developer names and affiliations	NIRAS
Member state(s) where developed	DK
Member State(s) where currently used	DK
Key publication references (including url)	None

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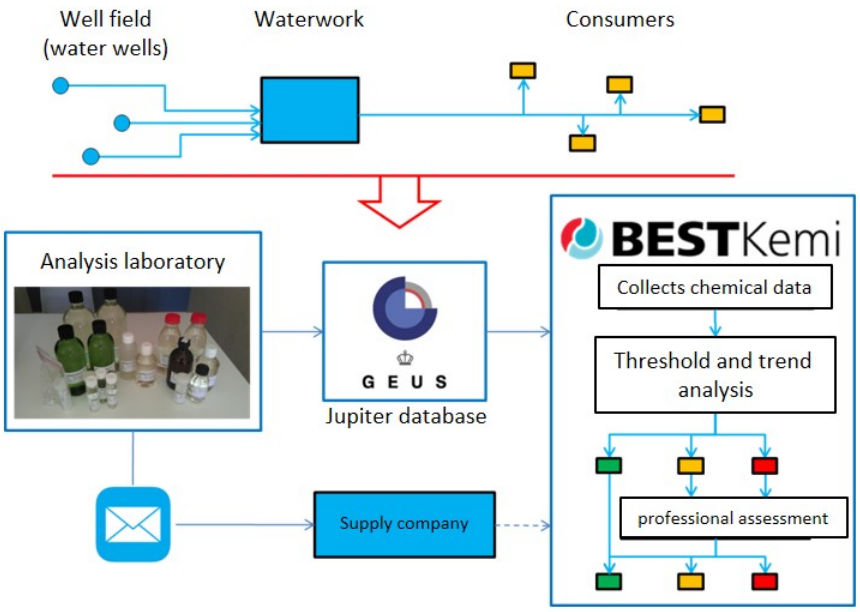
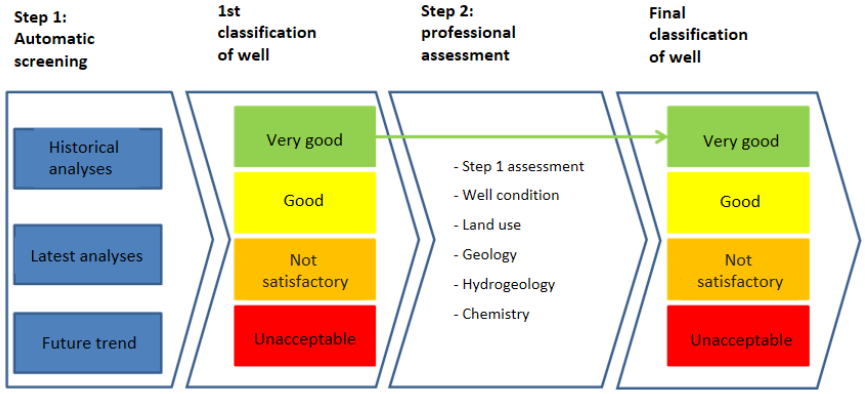
Any other useful information (e.g. screenshots of DST input/outputs)

Illustration of BEST Kemi's functionality:



Based on the groundwater chemical state of all water wells they are classified as: Red (Unacceptable), Orange (Not satisfactory), Yellow (Good) and Green (Very Good). The classification is conducted in two steps.



The user interface: