Ministry of Infrastructure and the Environment

Fact sheet

BRO: the Dutch Key Register of the Subsurface

Data types explained

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This BRO fact sheet, one of a series, is a publication of the Dutch Ministry of Infrastructure and the Environment.
The fact sheets provide detailed information on the BRO. The updated versions can be found at www.dinoloket.nl

In this issue

Goal of the BRO

The use of soil and subsurface data by government and private organisations has increased strongly in recent decades, both qualitatively and quantitatively. The data are crucial at operations levels, but also for solving societal problems. Such problems include mitigation of and adaptation to the effects of climate change, like rising sea levels and soil subsidence. Other examples are the use of subsurface information in spatial planning, subsurface constructions, geothermal energy and CO_2 storage. With the BRO the government aims to strongly improve the accessibility of subsurface information. This is achieved by standardizing public information on the subsurface and making it available to both governmental and other parties. The BRO is part of the national key register system. This system enables the government to improve its services by sharing key data and people, companies, buildings and the subsurface within the government. Once the BRO is implemented, all data on the subsurface will be managed in one location and made available for subsequent multiple use.

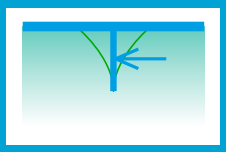
The BRO is the continuation of the existing registers *"Data and Information of the Dutch Subsurface (DINO, including NLOG)"* of TNO and the *"Soil Information System (BIS Nederland)"* of Alterra Wageningen University & Research Centre. The archaeological drilling samples will be added. Later on, data on the environmental quality of the subsurface may also be added to the BRO.

Subdomains of subsurface information

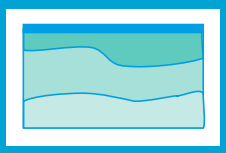
The governments is owner or administrator of a great diversity of data of the soil and subsurface domain. For the BRO these data have been divided into four subdomains of subsurface information:

- **Explorations**
  An exploration is an observation on the structure or composition of the subsurface at a point, along a line or in a surface. (e.g.: data acquired during drilling)

- **Models**
  A model is a coherent collection of data that shows a simplified schematisation of the subsurface. (e.g.: REGIS II)



- **Infrastructures**
  Infrastructures relate to both constructions in the subsurface as well as observation networks that provide information on the subsurface. In some cases an infrastructure has an information purpose while in other cases a mining or underground storage use. Excluded: from this domain are all cables and pipelines which are relegated to the “WION”-law.



- **Rights of use**
  A right of use is a licence granted by an authorized administrative body to extract or use the natural resources contained in the subsurface, or to store substances in the subsurface, as well as to install the necessary subsurface infrastructure. (e.g.: rights of use as defined in the Mining act)

Data types in the BRO

A BRO data type is a logically or practically restricted unit of information within the soil and subsurface field; a data type is implemented in the BRO by a single exchange format along with the corresponding documents. Here below the 4 domains of subsurface information are subdivided into the 20 data types to be implemented in the first phase of the BRO, including their definitions.

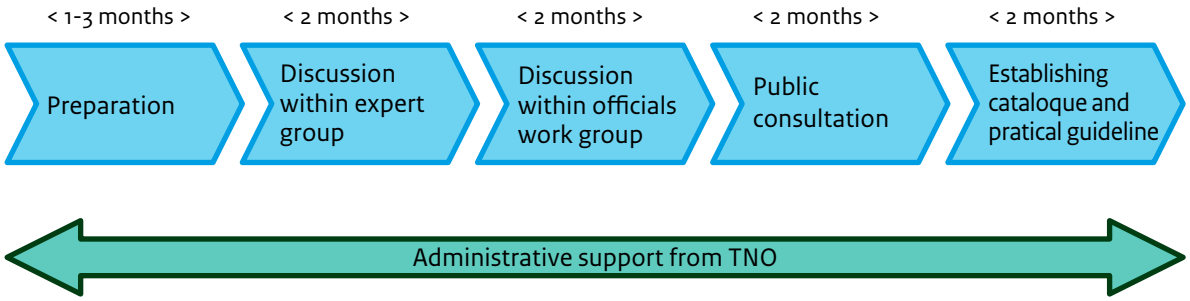
	Data types	Definition
	Explorations	
1	**Geotechnical cone penetration test**	*A geotechnical cone penetration test* is a type of exploration whereby a field measurement of the subsurface is performed by pressing a conical probe into the soil. Traditionally this type of measurement is used to determine parameters like the resistance and friction that the cone encounters during penetration, from which the mechanical properties of the subsurface can be derived. Over time the probe has evolved to such an extent that it can perform a wide range of measurements.
2	**Geo-electrical exploration**	*A geo-electrical exploration* is a type of exploration whereby a field measurement of the subsurface is performed by applying an electric current in the subsurface and creating an electric field. By measuring this field the soil resistance is determined.
3	**Seismic measurement**	*A seismic measurement* is a type of exploration where a field measurement of the subsurface is performed by causing vibrations and registering the reflection of the waves produced in the subsurface to determine for example the differences in acoustic impedance in the subsurface.
4	**Drilling sample profile**	*A drilling sample profile* is the description in terms of layers and compositions of that part of the subsurface that has been drilled. The profile is usually derived from a macroscopic description of the composition of the drilling samples. The profile can be made from various scientific perspectives, such as soil science, geology and archaeology.
5	**Drilling sample study**	*A drilling sample study* contains the results of all studies of samples from a drilling, intended for that exploration. The study may be performed within every geo-scientific discipline and is generally intended to gain further insight into the genesis, age, physical properties or chemical composition of the subsurface.
6	**Drilling sample photo**	*A drilling sample photo* is a photographic record of one or more drilling samples.
7	**Borehole measurement**	A *borehole measurement* contains the data registered during drilling by lowering measuring equipment into the borehole and/or the data that emerge from processing the measurement. Traditionally a probe is lowered into the borehole to measure the physical properties of the subsurface, like the natural gamma radiation or electrical conductivity.
8	**Soil profile recording**	*A soil profile recording* describes, in terms of the layers and compositions of a soil, a vertical exposure created by digging out a part of the subsurface, normally by making as so-called “profile depression”.
9	**Soil profile sample study**	*A soil profile sample study* contains the results of all the studies of samples from a soil profile recording intended for the soil exploration. The study is generally intended to gain further insight into the genesis, age, physical properties or chemical composition of the soil.

	Data types	Definition
	Rights of use	
10	**Mining Act license**	*A Mining Act license* derives from the Mining Act and relates directly to the exploration and/or production of resources or geothermal energy or the storage of substances in the subsurface, and all data considered relevant therein. This includes the occurrences of hydrocarbon and the related data as detailed in articles 112 and 113 of the Mining Decree as well as the data contained in the license area as started in article 111 of the Mining Decree.
11	**Water Act license**	*A Water Act license* derives from the Water Act and relates directly to the extraction from and/or infiltration of water in the subsurface, including geothermal storage, and all data considered relevant therein. Traditionally it concerns licenses for the extraction of groundwater for drinking water supply.
	Infrastructures	
12	**Mining Act Borehole**	*A Mining Act Borehole* includes all the data that describe a borehole falling within the scope of the Mining Act as an infrastructural object as well as the data relating to a borehole according to article 109 and 110 of the Mining Decree. The latter category of data is roughly equivalent to the data falling under data type 7. The data on the borehole as an infrastructure also contain, in principle, the data as stipulated in articles 74 and 76 of the Mining Decree.
13	**Groundwater quantity well**	*A groundwater quantity well* includes both the data that describe the well as an infrastructural object as well as the data on the groundwater level in the well.
14	**Groundwater quality well**	*A groundwater quality well* includes both the data that describe the well as an infrastructural object as well as the data on the chemical composition of the groundwater in the well.
15	**Mining Act well**	*A Mining Act well* includes the data of a well described in the Mining Act as an infrastructural object as well as the data on extraction and storage that relate to article 111 and 119 of the Mining Decree. The data on the well as an infrastructure also contain, in principle, the data as stipulated in articles 74 and 76 of the Mining Decree.
16	**Groundwater monitoring network**	*A groundwater monitoring network* contains the data that describe the network as an infrastructural entity including all data considered relevant therein. This data type concerns the monitoring networks under the EU Water Framework Directive as well as groundwater monitoring networks that have existed for decades. The monitoring points themselves are wells that are treated as separate data types (viz. nrs. 13 and 14).
17	**Soil quality monitoring network**	*A soil quality monitoring network* contains the data that describe the network as an infrastructural entity, the monitoring points, the data measured and all other data considered relevant. A specific example is the national soil quality monitoring network.
18	**Forestry soil quality monitoring network**	*The forestry soil quality monitoring network* contains the data that describe the network as an infrastructural entity, the monitoring points, the data measured and all other data considered relevant.
	Models	
19	**Geomorphological and soil models**	*Geomorphological and soil models* are specific maps, namely: • The geomorphological map of The Netherlands, 1:50.000 • The soil map of The Netherlands, 1:10.000 • The soil map of The Netherlands, 1:50.000 • The groundwater levels map of the Netherlands, 1:50.000
20	**Geological and hydrogeological models**	*Geological and hydrogeological models* are specific models, namely: • The digital geological model of The Netherlands (DGM 1:250.000) • The GeoTop model of The Netherlands (3D, uppermost 30 m) • The REGIS II model of The Netherlands

BRO data projects

For the BRO to perform effectively, good agreements concerning content and ways of exchanging data are needed. These agreements will be made per data type in a data project.
The success of these agreements stands or falls with support from the work field. Therefore all stakeholders will be involved in contributing to the establishments of these agreements.

The process
Each data project is subdivided in five stages (see figure below). The final result of each data project is a data catalogue and corresponding practical guideline. The catalogue describes the formal requirements the BRO imposes on the contents and exchange formats of the data type. The practical guideline indicates how these requirements can be fulfilled.



Stage 1: Preparations (initiation)

A data project starts with a thorough preparation by TNO. TNO, with appropriate support by external experts, will draft an initial proposal for the concerned data type. This initial proposal is exclusively used as input for the expert group. TNO will explicitly take note of, and base the initial proposal on, existing agreements and standards. The preparation stage will take one to three months depending on the complexity of the data type.

Stage 2: Discussion within Expert Group (Expertise)

The draft proposal of the first stage will be presented to an expert group. This group comprises a delegation of experts, representative for the field. The expert group members will be selected by TNO, in consultation with the BRO steering group, based on their specialist knowledge of the data type but also on their position within the work field. The expert group will make amendments to the initial proposal where required. The result of this stage is a draft catalogue and an explanatory supplement. Differences of opinion between expert group members will be indicated in the supplement, to be presented to the officials work group in stage 3. Stage 2 will take two months.

Stage 3: Discussion within Officials Work Group (Assessment)

The officials work group comprising representatives from the government bodies involved will assess the draft products of the expert group mainly in terms of whether the proposal formats are feasible. The group will also decide on residual questions and decision points signalled by the expert group, adjusting where necessary the draft data catalogue and supplement. This stage 3 will also take two months.

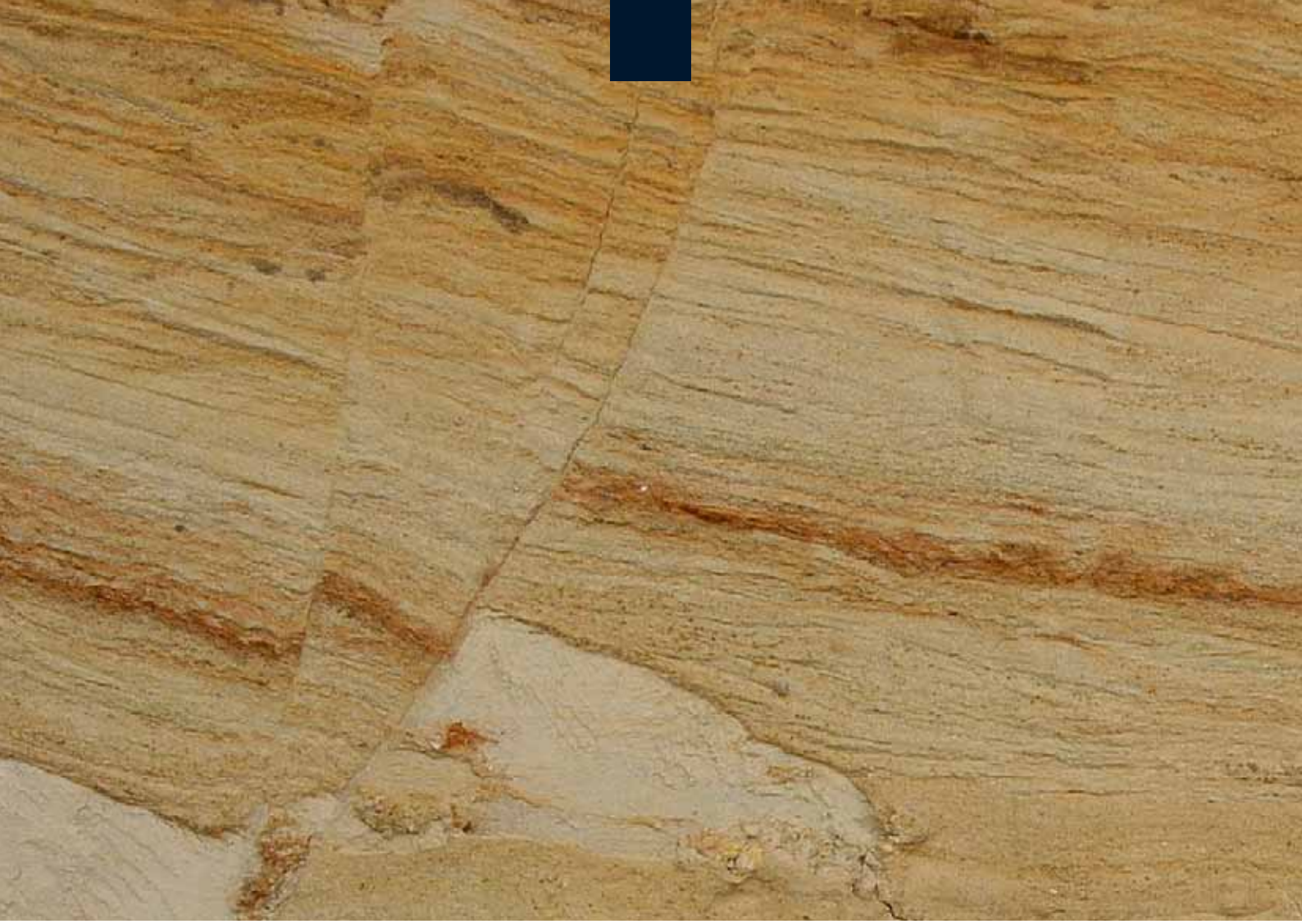
Stage 4: Public consultation (Participation)

In the fourth stage the draft products of the officials work group will be published for public consultation on www.dinoloket.nl. This will allow all stakeholders to comment and provide input. The public consultation of the draft data catalogue and practical directive will be open for two months.

Stage 5: Establishing Data Catalogue and Practical Guideline (Adjust and Finalize)

In the last stage TNO will incorporate all input received in a final proposal to the BRO steering group, consulting where necessary with the expert group and / or officials work group. The revised versions of data catalogue and the practical guideline will be presented to the BRO steering group for approval. These final adjustments will take two months approximately.

When all five steps are completed the data type is standardised.



Further information or comments

The BRO fact sheets are available at:
www.dinoloket.nl

General information on the geo key registers can be found at:
www.rijksoverheid.nl/basisregistraties

You can also subscribe to the newsletter for the Infrastructure and Environment key registers only in Dutch via the website:
https://abonneren.rijksoverheid.nl/subscriptions
This newsletter also contains the news of the BRO.

For specific questions or comments about the BRO, mail to:
bro@minienm.nl

See also:
www.dinoloket.nl
www.bisnederland.wur.nl

"Basisregistratie ondergrond" (Key register of the subsurface): the data on the structure and use of our subsurface, efficiently managed and accessible to all.