Oud-Turnhout Facies (Lichtaart Member)

Unit name: Oud-Turnhout Facies

Hierarchical unit name: Lichtaart Member

Type: Facies

Code: KlOu

Author(s): Verhaegen Jasper & Vandenberghe Noël

Alternative names: formerly part of the at the time not yet subdivided Kasterlee Formation sensu De Meuter and Laga (1976) and Laga et al. (2001).

Origin of the name: Named after a key borehole in which this facies was observed

Status: Formal

Date: 01/05/2022

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Characterizing description

The Oud-Turnhout Facies is a glauconite-rich facies of the Lichtaart Member (Kasterlee Formation). It's high glauconite content (30%) makes it distinct from the Hoge Berg Facies (4-5% glauconite). Other sedimentological characteristics of both facies are similar.

Type section, type locality, type borehole, type CPT and/or type geophysical borehole

Several boreholes in the Turnhout area contain reference data on the Lichtaart Member, where the northern glauconite-rich Oud-Turnhout Facies is present. The reference section selected for the Lichtaart Member is in the Rees borehole (017E0399; kb8d17e-B495). The full section described as Kasterlee Formation between 25 and 33,5 m is interpreted as the Lichtaart Member. Cores, sediment analyses and dinoflagellate cyst analyses are available in this interval (Buffel et al., 2001; Vandenberghe et al., 2020). The Kasterlee Formation in the Gierle borehole (017W0158 ; Kb8d17w-B14) between 26 and 34 m is also identified as the Lichtaart Member and has detailed grain-size analyses (Gullentops and Huyghebaert, 1999). Although the base of the Lichtaart Member is not reached in the Oud-Turnhout borehole (017E 0401;kb817e-B497), a section of about 11 m of the Lichtaart Member between 39 and 50 m with sediment analyses is juxtaposed to a gamma-ray log of the similar interval in the nearby Turnhout borehole (017E0398; kb8d17e-B294) in Louwye et al. (2020 fig. 4).

Description upper boundary

In the reference area of the Turnhout area boreholes, the Oud-Turnhout Facies is overlain by the characteristic Hukkelberg Gravel at the base of the Poederlee Sand (Louwye et al., 2020). The grain size of the Poederlee Sand is almost indistinguishable from the Lichtaart Member sand.

Description lower boundary

The lower boundary of the Lichtaart Member is not exposed. It is only known from boreholes. In the Turnhout area the boundary of the Oud-Turnhout Facies with the underlying Diest Sand Formation is

located where the fine grain size of the Lichtaart Member abruptly changes to coarser sand in the Diest Formation.

Thickness

In the boreholes of the Turnhout area, Gierle (017W0158/kb8d17w-B14), Rees (017E0399/kb8d17e-B495), Oud-Turnhout (017E 0401;kb817e-B497) and Turnhout (017E0398; kb8d17e-B294), the Oud-Turnhout Facies of the Lichtaart Member occurs underneath the Poederlee Sand and the thickness is 8 to 11 m.

Occurrence

The Oud-Turnhout Facies is known from boreholes in the Turnhout area and occurs north of the Hoge Berg Facies in the Lichtaart-Kasterlee hill ridge.

Regional correlations

Regional correlations need to respect the presence of the Messinian DN10 dinocyst biozone of de Verteuil & Norris in the Oud-Turnhout Facies of the Lichtaart Member in the Oud-Turnhout and Rees boreholes (Louwye & De Schepper, 2010; Vandenberghe et al., 2020). The limited available biostratigraphy of the Retie Member also contains the same DN10 dinocyst biozone suggesting that Lichtaart and Retie members are contemporaneous (Vandenberghe et al. 2020). The Lichtaart Member can be the more marine facies lateral from the other lagoonal to near-shore members of the Kasterlee Formation . The transition to the Breda Formation in the Netherlands is not clear. Towards the south, the glauconite-rich Oud-Turnhout Facies is replaced by the glauconite-poor Hoge Berg Facies.

Age

Dinoflagellate cyst biozone DN10 was identified in the Oud-Turnhout Facies (Rees borehole, 017E0399; kb8d17e-B495), attributing a late Tortonian to Messinian Miocene age to this facies.

Dataset

Data in the LIS are part of the DOV-Neogene data collection, including links to the GSB-collection data sheets.

Subset of the Kasterlee Formation: https://www.dov.vlaanderen.be/data/opdracht/2020-021580

References

Buffel, P., Vandenberghe, N., Goolaerts, S. & Laga, P., 2001. The Pliocene sediments in 4 boreholes in the Turnhout area (North-Belgium): the relationship with the Lillo and Mol Formations. Aardkundige Mededelingen, 11, 1–8.

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