

Hageland Diest Member (Diest Formation)

Unit name: Hageland Diest Member

Hierarchical unit name: Diest Formation

Type: Member

Code: DiHa

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Alternative names: in the past, Diest Formation (De Meuter & Laga, 1976; after Dumont, 1839) was often used for only this member

Origin of the name: Hageland region in Vlaams-Brabant.

Status: Formal

Date: 01/05/2022

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Characterizing description

The member is created to accommodate the poorly sorted medium to coarse, very glauconiferous, grey green to brownish, Diest Sand that crops out in between Brussels and Leuven, in Hageland, Zuiderkempen and western-central Limburg (Houthuys et al., 2020). In the outcrop area, the sand is often loosely or firmly limonite-cemented. Hageland ironstone has been used as iron ore and as building stones.

Glauconite content varies from 25% to 60%. The coarse beds often contain a subpopulation of 0.5 to 2 mm (sub)angular quartz grains. In the vertical direction, grain size is either constant or coarsening upwards. The sand shows various primary structures: large and small-scale cross-bedding, massive sand, spaced planar lamination, all of which can display scarce to abundant biogenic burrows, and homogenization by bioturbation. The cross-bedded facies may contain isolated or bundled clay laminae. The sand is non-calcareous and only occasionally contains limonite fossil prints.

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

The type locality is Diest, where exposures were available at the former town fortress. Hageland and Zuiderkempen can be considered as the type area. Numerous small and larger outcrops are found in the sunken roads. The Kesselberg geosite 2 km NE of Leuven and disused quarries 0.5 km NE of Wezemaal are well-known exposures. Additional exposures are temporarily offered at construction sites.

Description upper boundary

The upper boundary is, in the outcrop area, a near-planar truncation surface, either uncovered or covered by Quaternary continental deposits, and often strongly incised by the present topography. In its subcrop area, the upper boundary is not well-confined. Houthuys et al. (2020) argue the Kempen Diest Member covers the Hageland Diest Member.

Description lower boundary

Erosive lower boundary, well expressed in outcrop and core. Locally associated with a well-developed base gravel of rounded flint pebbles, especially in the area where deep local incisions at the base cut through underlying Neogene and Paleogene strata. The depositional unit stratigraphically underlying the Diest Formation is the Berchem Formation at the northern reaches of the Zuiderkempen area and the Bolderberg Formation in Hageland and central Limburg. The lower boundary surface of the Diest Formation incises by variable amounts, often by several 10s of metres, into the underlying units, especially in Hageland and Zuiderkempen, possibly also in north Limburg. At these locations, any older Neogene, Oligocene or upper to middle Eocene deposit that occurs in NE Belgium may underlie the Diest Formation.

Thickness

General evolution from less than 10 m near the south and west margins of its extent to several 10s of metres in the centre of its extent. Important thickness variations in Hageland and Zuiderkempen are related to the incised nature of the member base. The thickness reaches more than 100 m in the centre of some incisions.

Occurrence

Outcrop area between Brussels, Leuven, Diest, Heusden-Zolder, Geel and Heist-op-den-Berg (Hageland and Zuiderkempen), Subcrop area to the northeast of the outcrop area, in central and possibly into north-Limburg and continuing into SE-Netherlands.

Regional correlations

The Hageland Diest Member is the only member of the Diest Formation that occurs in the outcrop area of Hageland and Zuiderkempen. It represents the bulk of the deposits of the first sedimentary cycle inside the Diest Formation (Houthuys et al., 2020; Vandenberghe et al., 2014). The cycle is interpreted as the fill of an incised large tidal inlet of the southern North Sea bight, which was at that time situated in the Lower Rhine embayment. It may be age-equivalent to the Borsbeek, Deurne and lower Dessel members as well as to part of the fine-grained and bioturbated Diest Sand found in north-Limburg.

Age

There is no direct proof of the age of the member, except its relative position in the lithostratigraphy of the area. Awaiting further proof, the age is assumed to be late Miocene: Tortonian, biochron DN8.

Dataset

Data in the LIS are part of the DOV-Neogene data collection, including links to the GSB-collection data sheets: <https://www.dov.vlaanderen.be/data/opdracht/2020-021774>.

Subset of the Diest Formation: <https://www.dov.vlaanderen.be/data/opdracht/2020-021774>

References

De Meuter, F. & Laga, P., 1976. Lithostratigraphy and biostratigraphy based on benthonic foraminifera of the Neogene deposits in Northern Belgium. Bulletin Belgische Vereniging voor Geologie/Bulletin de la Société belge de Géologie, 85, 133–152.

Dumont, A., 1839. Rapport sur les travaux de la carte géologique pendant l'année 1839. Bulletins de l'Académie royale des Sciences et Belles-Lettres de Bruxelles, 6/2, 464–485.



Houthuys, R., Adriaens, R., Goolaerts, S., Laga, P., Louwye, S., Matthijs, J., Vandenberghe, N. & Verhaegen, J., 2020. The Diest Formation: a review of insights from the last decades. *Geologica Belgica*, 23/3-4, 199-218. <https://doi.org/10.20341/gb.2020.012>

Vandenberghe, N., Harris, W.B., Wampler, J.M., Houthuys, R., Louwye, S., Adriaens, R., Vos, K., Lanckacker, T., Matthijs, J., Deckers, J., Verhaegen, J., Laga, P., Westerhoff, W. & Munsterman, D., 2014. The implications of K-Ar glauconite dating of the Diest Formation on the paleogeography of the Upper Miocene in Belgium. *Geologica Belgica*, 17, 161–174.