Diest Formation

Unit name: Diest Formation

Hierarchical unit name: /

Type: Formation

Code: Di

Author(s):

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- Modification of: De Meuter & Laga (1976), after Dumont (1839)

Alternative names: disused names: Sables et grès de Diest à Terebratula perforata, Sable diestien, Diestiaanzand

Origin of the name: see Houthuys et al. (2020) for an extensive overview

Status: Formal

Date: 01/05/2022

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Characterizing description

The Diest Formation consists of grey green to brownish, poorly sorted, fine to medium to coarse very glauconiferous sand, locally cemented by variable amounts of iron (hydr)oxide into ironstone, in particular in the outcrop areas of Hageland and Zuiderkempen. 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, displaying varying intensities of bioturbation. The cross-bedded facies may also contain isolated or bundled clay laminae. In the outcrop area, macrofossils are only known from a small number of localities, and they exist solely in the form of casts. In the shallow and deeper subsurface of the Antwerp and the Antwerp Campine areas, calcareous macro- and microfossils are locally abundant.

The subdivision of the Diest Formation into members still necessitates further study (Houthuys et al. 2020; Goolaerts et al., 2020). The present views lead to maintaining the Dessel Member and Deurne Member and introducing the Hageland Diest Member, Kempen Diest Member and the Borsbeek Member.

The local facies "clayey Diest" and "Bosbeek/Opoeteren" (see location in Vandenberghe & Louwye, 2020, Fig. 3, added in annex 2) need better descriptions of extent, correlations and depositional structures. Therefore, no formal members inside the Diest Formation are proposed for these facies now.

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. In the wide neighbourhood of Diest, exposures are temporarily offered at construction sites. The exposures represent only the Hageland Diest Member. A key permanent outcrop is present at the Kesselberg in Leuven.

No type borehole has been selected. The variation in available descriptions and geophysical log signatures reflects the geographical variation inherent of this formation.

Description upper boundary

The upper boundary is, in the outcrop area (see Annex 1), a near-planar truncation surface, either uncovered or covered by Quaternary continental deposits, and often strongly incised by the present-day topography. In its subcrop area (Annex 1), the upper boundary is a near-planar truncation surface, covered by the Kasterlee Formation, the formation that stratigraphically follows the Diest Formation (Annex 2). Locally, inside the Roer Valley Graben, the overlying deposit is the Inden Formation (Louwye & Vandenberghe, 2020; Annex 3). At the city of Antwerpen, the overlying deposit is the Kattendijk Formation, which west of Antwerpen truncates the Diest Formation (Deckers & Louwye, 2020).

Description lower boundary

The lower boundary is erosive, locally, and in particular in the Hageland and Zuiderkempen areas, deeply incising into older Neogene and Paleogene strata. A lag deposit draping the base is present in many localities (Houthuys et al., 2020; Goolaerts et al., 2020). The directly underlying unit, if not removed by the strong erosion at the base of the Diest Formation, is the Berchem Formation in the Antwerpen and Kempen area and the Bolderberg Formation in Vlaams-Brabant and Limburg. Also when these formations have been preserved, there is an important hiatus below the Diest Formation (Annex 2).

Thickness

General evolution from less than 10 m in the west and southwest of its extent to almost 200 m in NE Belgium inside the Roer Valley Graben. Important thickness variations in Hageland and Zuiderkempen are related to the incised nature of the formation base. The thickness reaches more than 100 m in the centre of some of those incisions.

Occurrence

See Annex 1. Outcrop area from Brussels to Leuven and Hageland in Vlaams-Brabant, from Antwerpen to Zuiderkempen in the province of Antwerpen, neighbouring area in western Limburg. Subcrop area to north and northeast of the outcrop area and continuing into SE-Netherlands.

Regional correlations

The Diest Formation can be correlated with the Diessen Formation in the Netherlands to the north, which is bounded by the Mid Miocene Unconformity at its base and the Late Miocene Unconformity at its top (Munsterman et al., 2019). In the Roer Valley Graben, the Diest Formation is partly equivalent to the Inden Formation.

Age

Late Miocene: Tortonian (top part of DN8 biozone) - early Messinian (at least base of DN10 biozone) (Annex 2).

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

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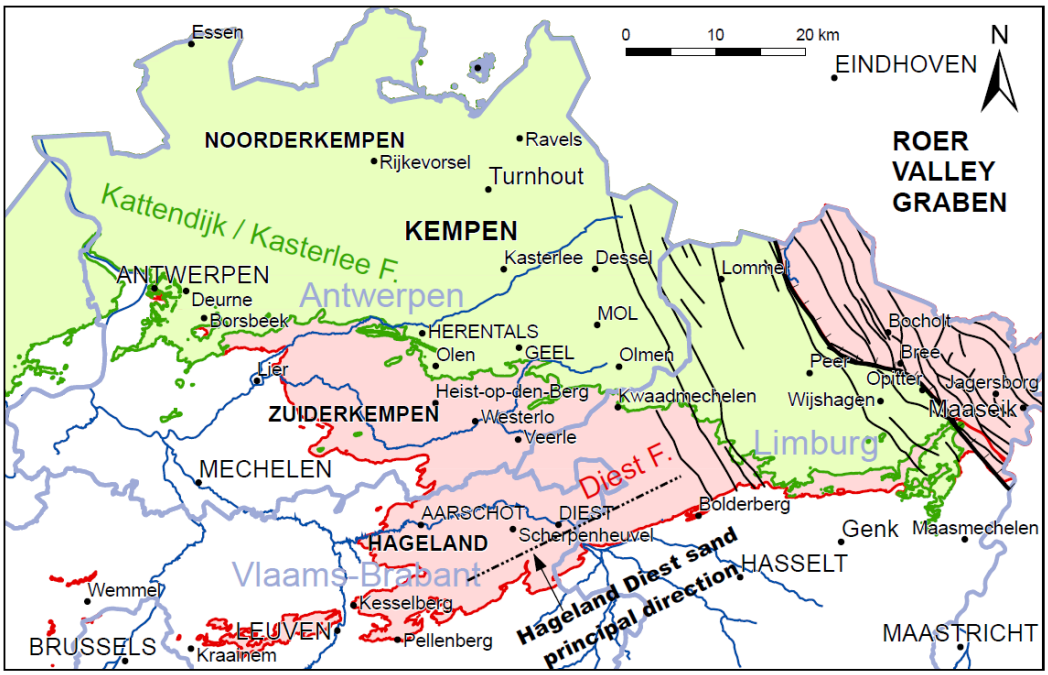
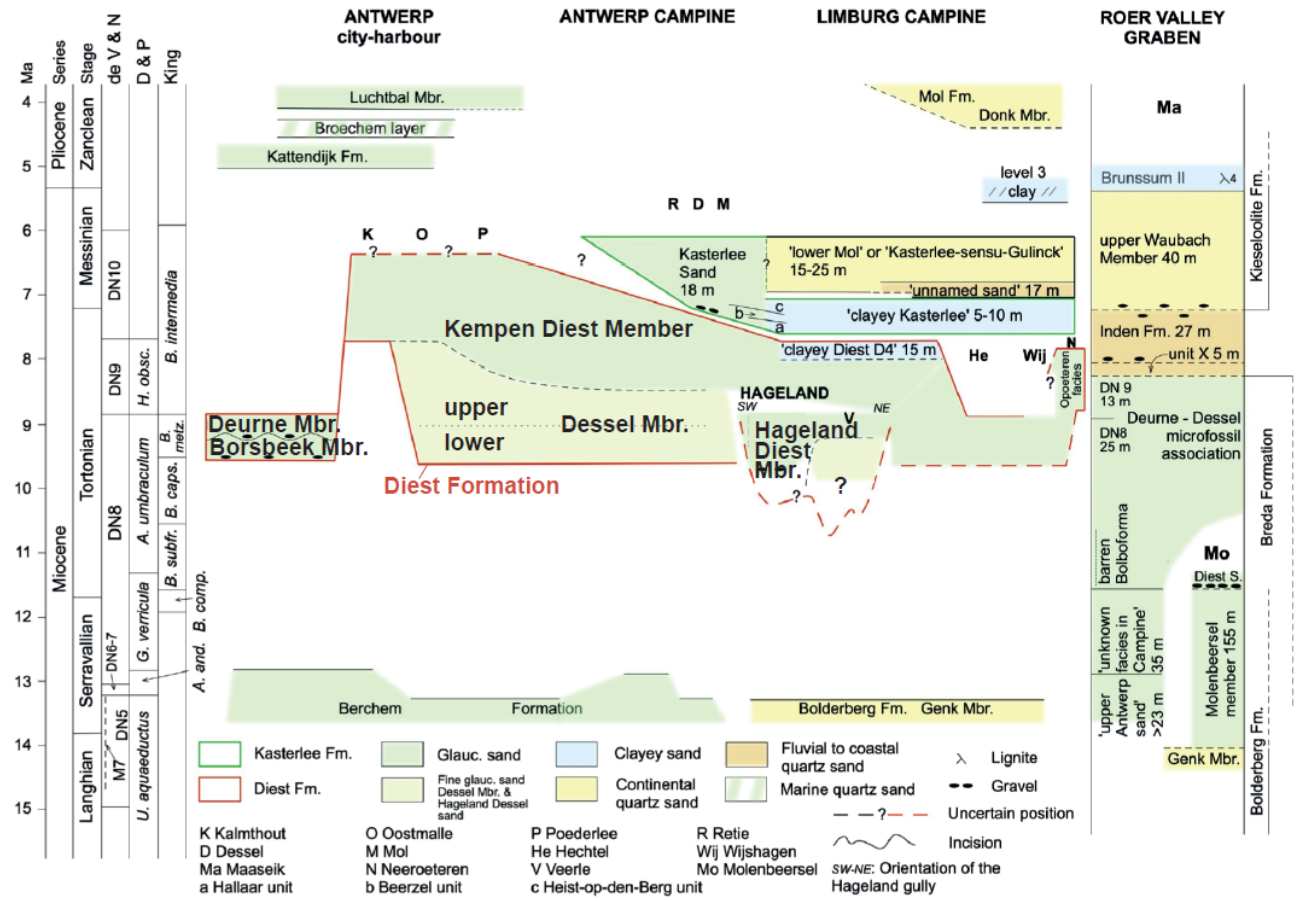
Vandenberghe, N. & Louwye, S., 2020. An introduction to the Neogene stratigraphy of northern Belgium: present status. Geologica Belgica, 23/3-4, 97-112. https://doi.org/10.20341/gb.2020.008

Annexes

Annex 1: Fig. 1B of [Houthuys et al. (2020)]:



Annex 2: Fig. 3 of [Vandenberghe & Louwye (2020)], with member names highlighted:



Annex 3: Fig. 3 of [Louwye & Vandenberghe (2020)](), with member names highlighted: