

Houthalen Member (Bolderberg Formation)

Unit name: Houthalen Member

Hierarchical unit name: Bolderberg Formation

Type: Member

Code: BbHo

Author(s):

- Compiled by: Louwye Stephen, Adriaens Rieko, Deckers Jef, Vandenberghe Noël, Verhaegen Jasper

- Modification of: Tavernier & De Heinzelin (1963); revised by De Meuter & Laga (1976)

Alternative names: This unit includes the Elsloo gravel at its base.

Origin of the name: The origin of the name of the unit is discussed in De Meuter & Laga (1976) and Louwye et al. (2020).

Status: Formal

Date: 01/05/2022

How to refer: Louwye, S., Adriaens, R., Deckers, J. Vandenberghe, N. & Verhaegen, J., 2023. The Houthalen Member, 01/09/2023. National Commission for Stratigraphy Belgium. <http://ncs.naturalsciences.be/lithostratigraphy/Houthalen-Member>

Characterizing description

The Houthalen Member is a dark green, often clayey, medium fine-grained sandy unit, micaceous, slightly ligniferous and glauconitic. Dispersed and concentrated mollusks occur which are also reworked in the basal gravel of the superjacent Diest Formation (De Meuter & Laga, 1976). The Houthalen Member has an average glauconite content of 17% (Adriaens, 2015). The Elsloo gravel at the base of the Houthalen Member consists of reworked Oligocene components, dark blue, egg-shaped, indented phosphate pebbles and shark teeth (Vandenberghe et al., 1998).

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

The type locality is Houthalen (north of Hasselt). The type section is the mine shaft "Puits no. 1)" of the Houthalen coal mine (De Meuter & Laga, 1976; after Glibert, 1945). The Houthalen Member in the Wijshagen borehole (DOV [kb18d48w-B181](#); GSB 048W0180; depth 162 m to probably 178 m) is an alternative type section. The Houthalen borehole (DOV [kb25d62e-B274](#); GSB 062E0270) is a type geophysical borehole with the Houthalen Member expressed by high gamma-ray and low resistivity values between 90 m and 101 m depth.

Description upper boundary

The boundary with the superjacent Genk Member is gradual and not easily discerned, and coincides with an upwards decrease in glauconite content and therefore change towards paler colours. On borehole logs, this boundary is expressed by a strong upwards decrease in gamma-ray values and increase in resistivity values.

Description lower boundary

The Houthalen Member rests with the basal Elsloo Gravel unconformably on the Oligocene Voort Formation. The lower boundary is geophysically not easily detected but coincides regularly with an upward increase of the gamma ray values and a decrease of the resistivity values (Deckers et al. 2019).

Thickness

11 m in the Houthalen borehole (DOV [kb25d62e-B274](#); GSB 062E0270), 16 m in the Wijshagen borehole (DOV kb18d48w-B181; GSB 048W0180) and reaches a maximum of 30 m in the Molenbeersel boreholes (DOV kb18d49w-B225 and kb18d49w-B226; GSB 049W0225 and 049W0226) in the differentially subsiding Roer Valley Graben.

Occurrence

The Houthalen Member occurs in the subsoil of the type area and outcrops in the hills near Bolderberg, Waanrode (south of the city of Diest) and Lubbeek (De Meuter & Laga, 1976).

Regional correlations

Louwye et al. (2020) consider the greater part of the Houthalen Member coeval with the Edegem and Kiel members, while the topmost part probably correlates with the lower part of the Antwerp and Zonderschot members. It correlates with the Kakert Member of the Groote Heide Formation in the Netherlands (Deckers & Munsterman, 2020).

Age

The benthic foraminifers from the Houthalen Member were extensively studied by De Meuter (1980), De Meuter & Laga (1976) and Willems et al. (1988) and indicated deposition during early Miocene times. The analysis of the planktonic foraminifera (Hooyberghs & De Meuter, 1972; Hooyberghs, 1983; Hooyberghs & Moorkens, 1988) indicates deposition during the Burdigalian. Nannoplankton studies (Martini & Müller, 1973; Verbeek et al., 1988) point towards a lower Miocene age. Wouters (1978) recognised the lower Miocene U2 Ostracoda Zone, while Gaemers (1988) reports the presence of the late Burdigalian to Langhian otolith Zones 12/13.

Dataset

Data in this LIS are part of the [DOV-Neogene data collection](#), including links to the GSB-collection data sheets.

Subset of the lower and middle Miocene: <https://www.dov.vlaanderen.be/data/opdracht/2020-022192>

References

- Adriaens, R., 2015. Neogene and Quaternary clay minerals in the southern North Sea. Unpublished Ph.D. Thesis, KU Leuven, Leuven, 272 p.
- Deckers, J., De Koninck, R., Bos, S., Broothaers, M., Dirix, K., Hamsch, L., Lagrou, D., Lanckacker, T., Matthijs, J., Rombaut, B., Van Baelen, K. & Van Haren, T., 2019. Geologisch (G3Dv3) en hydrogeologisch (H3D) 3D-lagenmodel van Vlaanderen. Studie uitgevoerd in opdracht van het Vlaams Planbureau voor Omgeving, departement Omgeving en de Vlaamse Milieumaatschappij. VITO, Mol, VITO- rapport 2018/RMA/R/1569.
- Deckers, J. & Louwye, S., 2019. Late Miocene increase in sediment accommodation rates in the southern North Sea Basin. *Geological Journal*, 55, 728–736. <https://doi.org/10.1002/gj.3438>
- Deckers, J., & Munsterman, D., 2020. Middle Miocene depositional evolution of the central Roer Valley Rift System. *Geological Journal*, 1–10, <https://doi.org/10.1002/gj.3799>

- De Meuter, F., 1980. Benthonic foraminifera from the Miocene of Belgium. *Aardkundige Mededelingen*, 1, 78–170.
- 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.
- Gaemers, P.A.M., 1988. The regional distribution of otolith assemblages; correlation of the interregional zonation with the regional lithostratigraphic formations. In Vinken, R. (ed.), *The Northwest European Tertiary Basin. Geologisches Jahrbuch, Reihe A*, 100, 379–389.
- Glibert, M., 1945. Faune malacologique du Miocène de la Belgique. I. Pélécytopes. *Mémoires de l'Institut Royal des Sciences naturelles de Belgique*, 103, 1–263.
- Hooyberghs, H. & De Meuter, F., 1972. Biostratigraphy and interregional correlation of the Miocene deposits of Northern Belgium based on planktonic foraminifera; the Oligocene-Miocene boundary on the southern edge of the North Sea Basin. *Mededelingen van de Koninklijke Academie voor Wetenschappen, Letteren en Schone Kunsten van België, Klasse der Wetenschappen*, 34, 3, 1–47.
- Hooyberghs, H., 1983. Contribution to the study of planktonic foraminifera in the Belgian Tertiary. *Aardkundige Mededelingen*, 2, 1–131.
- Hooyberghs, H. & Moorkens, T., 1988. Planktonic foraminifera - Belgium. In Vinken, R. (ed.), *The Northwest European Tertiary Basin. Geologisches Jahrbuch, Reihe A*, 100, 190–198.
- Louwyse, S., Deckers, J., Verhaegen, J., Adriaens, R. & Vandenberghe N., 2020. A review of the lower and middle Miocene of northern Belgium. *Geologica Belgica*, 23/3-4, 137-156. <https://doi.org/10.20341/gb.2020.010>
- Martini, E. & Müller, C., 1973. Nannoplankton-Gemeinschaften im Miozän und Pliozän des Nordseebeckens. *Neues Jahrbuch für Geologie und Paläontologie, Monatshefte*, 9, 555–564.
- Tavernier, R. & de Heinzelin, J., 1963. Introduction au Néogène de la Belgique. *Mémoires de la Société belge de Géologie, de Paléontologie et d'Hydrologie, série in-8°*, 6, 7–30.
- Vandenberghe, N., Laga, P., Steurbaut, E., Hardenbol, J. & Vail, P. R., 1998. Tertiary sequence stratigraphy at the southern border of the North Sea Basin in Belgium. In de Graciansky, P.-C., Hardenbol, J., Jacquin, T. & Vail, P.R. (eds), *Mesozoic and Cenozoic Sequence Stratigraphy of European Basins. SEPM Special Publication*, 60, 119–154. <https://doi.org/10.2110/pec.98.02.0119>
- Verbeek, J., Steurbaut, E. & Moorkens, T., 1988. Nannoplankton - Belgium. In Vinken, R. (ed.), *The Northwest European Tertiary Basin. Geologisches Jahrbuch, Reihe A*, 100, 267–273.
- Willems, W., Laga, P. & Moorkens, T., 1988. Benthic foraminifera - Belgium. In Vinken, R. (ed.), *The Northwest European Tertiary Basin. Geologisches Jahrbuch, Reihe A*, 100, 179–188.
- Wouters, K. 1978. Een systematische, biostratigrafische en paleobiologische studie van de Ostracoda uit de Miocene afzettingen in Noord-België. Unpublished Ph.D. Thesis, KU Leuven, Leuven, 3 vol.
-