

## Heist-op-den-Berg Member (Kasterlee Formation)

**Unit name:** Heist-op-den-Berg Member**Hierarchical unit name:** Kasterlee Formation**Type:** Member**Code:** KIHe**Author(s):** Verhaegen Jasper & Vandenberghe Noël**Alternative names:** 'clayey Kasterlee' unit (Vandenberghe et al., 2020), 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:** Description of the Kasterlee Formation at Heist-op-den-Berg and Beerzel by Fobe (1995)**Status:** Formal**Date:** 01/05/2022**How to refer:** Verhaegen, J. & Vandenberghe, N., 2023. The Heist-op-den-Berg Member, 01/09/2023. National Commission for Stratigraphy Belgium. <http://ncs.naturalsciences.be/lithostratigraphy/Heist-op-den-Berg-Member>**Characterizing description**

In its type area around the hills of Heist-op-den-Berg and Beerzel up to Olen more to the north, the Heist-op-den-Berg Member can be easily recognized by the yellow-brownish, due to oxidation, well-sorted fine-grained sand with a very low glauconite content and the occurrence of thin grey and thick purple clay intercalations. The base of the member can be placed at the base of the first thick purple clay layer (>10 cm). The glauconite content of the sandy layers in the Heist-op-den-Berg Member is similar to the underlying Beerzel Member sand (2–4%, glauconite/quartz ratio of 0.03–0.05). Also the grain size distribution of the sandy intercalations is very similar to the Beerzel Member, well sorted with a mode at ~185 µm, though with a slightly larger fine fraction. Both feldspar content (5–6%, feldspar/quartz ratio of 0.07–0.08) and content of dioctahedral 2:1 Al-rich layer silicates (7–9%, 2:1 Al-clay/quartz ratio of 0.09–0.12) are similar to the Beerzel Member. In contrast to the Beerzel Member, The Heist-op-den-Berg Member sand layers contain more kaolinite (5–7%, kaolinite/2:1 Al-clay ratio of 0.6–1.0) indicating an increased component of continental sediment supply. The clay layers are mainly composed of 2:1 Al-clays (32–44%, 2:1 Al-clay/quartz ratio of 0.9–2.3) and kaolinite (20–25%, kaolinite/2:1 Al-clay ratio of 0.5–0.6), and a considerable amount of goethite is present as well (2–4%, goethite/glauconite ratio of 0.3–0.7).

The Heist-op-den-Berg Member also occurs consistently north and northeast of its type area, where it is buried deeper under younger Neogene and Quaternary sediments and can only be sampled in cores. There as well, the member is characterized by an alternation of fine sand and grey clay layers. In contrast to the type area, the sandy intercalations have a green colour due to an increased glauconite content (Vandenberghe et al., 2020). Both on CPT's and borehole logs the sand-clay alternation can be easily recognized based on the fluctuating qc and gamma-ray signals.

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

The proposed type section of the lower three members of the Kasterlee Formation, including the Heist-op-den-Berg Member, is the sunken lane atop the hill of Heist-op-den-Berg (DOV TO-20140919 and TO-20190617). The type section is described in detail in Verhaegen et al. (2014) and Verhaegen et al. (2020). The member name was originally proposed after a study of this section by Fobe (1995).

### **Description upper boundary**

In the southern area near the type section, the Heist-op-den-Berg Member is generally covered by a thin Quaternary cover. Towards the northeast, the Heist-op-den-Berg Member is covered by the Retie Member of the Mol Formation. A rather sharp boundary can be observed from the green sand and grey clay alternations in the Heist-op-den-Berg Member to the fine grey quartz sand of the Retie Member (Vandenberghe et al., 2020, Plate 1). In borehole logs, this boundary represents a sharp drop in gamma-ray signal, while a strong increase in qc value is observed on CPT's. Towards the northwest, near Kasterlee village, the Heist-op-den-Berg Member is locally overlain by the Lichtaart Member. This boundary has only been observed in CPT's and is also characterized by a sharp increase in qc value (Verhaegen et al., 2020, Fig. 10).

### **Description lower boundary**

In the type section, the Heist-op-den-Berg Member is underlain by the Beerzel Member. The boundary is placed at the occurrence of the first dm-scale purple clay layer (Verhaegen et al., 2020). The Heist-op-den-Berg Member can be easily distinguished based on the alternation of fine sand and clay layers, in contrast to the homogenous fine sand of the underlying Beerzel Member.

Towards the north, the Beerzel Member is often absent. Where it is present, it can be recognized by the constant CPT signal or gamma-ray signal (e.g. ON-Kasterlee-1; Verhaegen et al., 2020, Fig. 10), compared to the strongly fluctuating signal of the overlying Heist-op-den-Berg Member. In cores as well, the boundary between both members occurs where the alternation of clay and sand layers starts (Vandenberghe et al., 2020). Where the Beerzel Member is absent, the Heist-op-den-Berg Member lies directly on top of the basal Hallaar Member of the Kasterlee Formation. The boundary can again be placed at the first cm- to dm-scale clay layer at the base of the Heist-op-den-Berg Member, followed by a sand-clay alternation within the Heist-op-den-Berg Member.

### **Thickness**

In the type section, the Heist-op-den-Berg Member is cut off by a Quaternary cover and does not represent the initial thickness. Based on CPT's near the type section, approximately 4 m of Heist-op-den-Berg Member is present on top of the hills (Verhaegen et al., 2020). Towards the north, the thickness fluctuates between 2 and 5 m, with an apparent general decrease towards the northeast where the overlying Retie Member strongly increases in thickness.

### **Occurrence**

The Heist-op-den-Berg Member occurs consistently in the southern, northern and northeastern sections of the Kasterlee Formation occurrence area. Only in the northwestern area, west of Kasterlee, the member is absent.

### **Regional correlations**

The Heist-op-den-Berg Member and underlying Beerzel Member are part of a progradational coastal barrier and back-barrier lagoon system, in which the Heist-op-den-Berg Member represents the lagoonal sand-clay alternation. As such, the Heist-op-den-Berg Member is laterally time equivalent with the Beerzel Member deposited more to the northwest, and with a lower part of the shallow open marine Lichtaart Member deposited in the northwest of the Kasterlee Formation occurrence zone.

### Age

Dinoflagellate cyst biozone DN10 was identified in the Heist-op-den-Berg Member (ON-Dessel-2 borehole 031W0338 / kb17d31w-B299), attributing a late Tortonian to Messinian Miocene age to this member.

### 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>

Subset of the Heist-op-den-Berg type section: <https://www.dov.vlaanderen.be/data/opdracht/2020-022424>

### References

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