

Aggregates and the Geopark Way Trail

The Aggregates Levy Sustainability Fund

The ALSF aims to reduce the environmental impacts of the extraction of aggregates and to deliver benefits to areas subject to these impacts. The extraction of aggregates from the environment (sand, gravel and crushed rock) represents 82 per cent by tonnage of all non-fossil fuel minerals extracted from the land and sea in the UK. The objectives of the Fund support the delivery of Defra's goals of tackling the causes and consequences of climate change and securing a healthy natural environment.

What are aggregates?

Aggregates refer to any granular material formed from a natural rock substance. They can either be sand and gravel, or hard rock.

Typical rock types used for aggregate are igneous rocks (e.g., granite or dolerite), sedimentary rocks (e.g., limestone and sandstone) and metamorphic rocks (e.g., quartzite). Additionally unconsolidated sand and gravels are quarried as aggregate.

What are aggregates used for?

Aggregates are predominately used in construction, such as in our roads and buildings, but are also used to filter water and cleanse emissions from power stations.

The main uses of aggregate are:

- base course material used as foundation for sealed and unsealed roads
- repairing and surfacing roads
- maintaining railway lines (ballast)
- manufacturing concrete products such as blocks, pipes and paving
- making bitumen paving for surfacing roads, airport runways and port facilities
- drainage and filtration
- making concrete (concrete is made mostly from aggregate)
- filter beds

Aggregates along the Geopark Way trail

The Geopark Way trail passes a variety of aggregate sites along its length. All but one are now inactive, and the majority were worked during the later half of the 20th century.

The rocks that have been quarried fall into three categories: Sand & gravel, limestone and igneous rocks. Additionally there are a couple of quarries where sandstone has been extracted for use as an aggregate.

Sand and gravel

The majority of sand and gravels that have been extracted were deposited during the Quaternary period. The effects of glaciations – their advance and retreat, plus the

changing dynamics of drainage basins and river flow has resulted in vast quantities of sand and gravel being deposited onto valley floors and on river flood plains.

These quaternary sediments are evident at many locations along the trail. Commercial extraction of sand and gravel took place at Knowles Sands (section 1 of the trail), Hartlebury (section 5 of the trail) and Larford Lake (section 6 of the trail)

Limestone

The limestone that has been extracted formed during the Silurian period.

Extraction of limestone on the Abberley, Suckley and Ledbury hills took place over a period of many centuries, resulting in the presence of numerous quarries along the ridge lines thus opening up hitherto hidden geological sections for study. Predominately used as aggregate, other uses for the extracted limestone included building stone and lime production.

Silurian rocks and the topography they form are encountered mainly during the middle 1/3 of the trail i.e. sections 6 through to 12. Commercial extraction of limestone is most evident in section 7 of the trail.

Granite and diorite of the Malvern complex

These are the two main rock types that comprise the Malvern Hills. They formed during the Precambrian period deep below the surface in a magma chamber. Hundreds of millions of years later the rocks were violently brought to the surface

Extraction took place at many locations along the length of the Malvern Hills during the 19th and 20th century. All operations ceased by the 1970.

Outcrops of the Malverns complex can be seen along the length of the Malvern Hills. Tank quarry is the only quarry that you pass through on the Geopark Way (section 10 of the trail)

Dolerite and basalt

Dolerite and basalt have been extracted from the Knowle Hill area. The rocks formed during the Carboniferous period, as a result of volcanic activity sparked the Variscan Orogeny.

The quarries where extraction took place are not visible from the Geopark Way. However the land form of Knowle Hill illustrates the sub and near surface influence of the intrusion. A number of the tracks, followed by the Geopark Way, over Knowle Hill are surfaced with dolerite aggregate (section 3 of the trail)

PLEASE NOTE THAT ALL SOLID ROCK (LIMESTONE AND IGNEOUS ROCK) QUARRIES ALONG THE ROUTE OF THE GEOPARK WAY ARE IN PRIVATE OWNERSHIP. ACCESS INTO THESE QUARRIES IS NOT PERMITTED AND IS POTENTIALLY DANGEROUS.