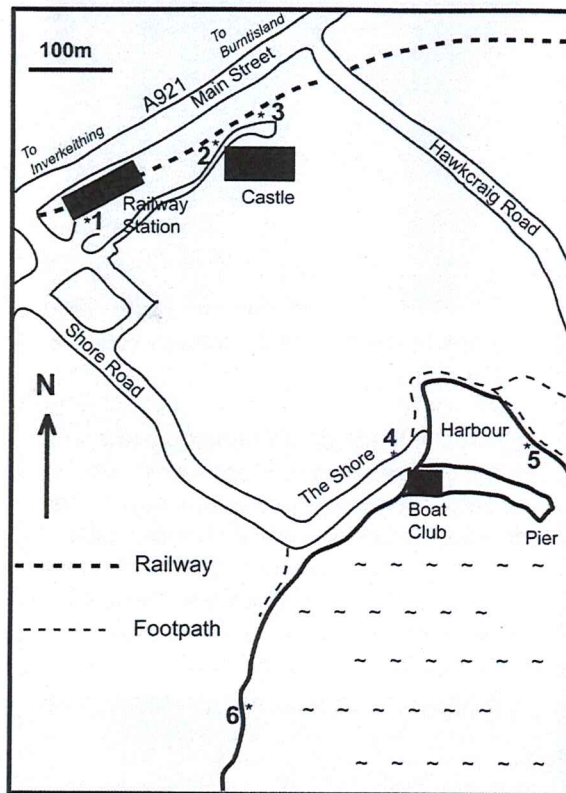


LOCALITY MAP



GLOSSARY

BASALT: A fine-grained dark igneous rock
DOLERITE: A coarser variety of basalt
IGNEOUS: Molten rock (magma) generated at high temperatures
MUDSTONE: A rock formed mostly from mud
SANDSTONE: A rock formed by the accumulation of sand grains, mostly quartz
SEDIMENT: A rock formed by the accumulation of grains of pre-existing rocks which have been eroded
SILL: A layer of magma which has been injected between layers of pre-existing sediments

geoHeritage Fife
 was set up in 2000 to:

- * publicise Fife's geological heritage
- * provide educational resources in geology
- * promote geotourism

If you would like to assist with these aims, consider joining the group by contacting geoHeritage Fife
 T: 01334 828623

Scottish Charity No. SC 032509

Fife LGS/RIGS

RIGS were Regionally Important Geological and Geomorphological Sites, but are now known as Local Geodiversity Sites (LGS).

Fife LGS is concerned with identifying and assessing important sites and notifying the statutory planning authority of these sites. Fife RIGS was incorporated into geoHeritage Fife in 2005.

SAFETY INFORMATION

This trail, about 2.5km long in total and undulating, follows part of the Fife Coastal Path. Choose a low tide for the walk. You must wear stout footwear and clothing appropriate for the current weather conditions. A walking pole could be useful.
DO NOT HAMMER OR REMOVE ROCKS.

TRAVEL INFORMATION

Rail: Regular Scotrail services between Markinch, Kirkcaldy and Edinburgh serve Aberdour

Road: A921 Burntisland and Inverkeithing

Bus: Stagecoach service X57 Kirkcaldy - Edinburgh; service 7 Leven - Edinburgh

Aberdour Geological Trail



Carboniferous rocks
 (332 million years old)

Faults

Intrusion of molten magma (sill)

Volcanic ashes



geoHeritage
 Fife



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Locality 1 Aberdour Railway Station



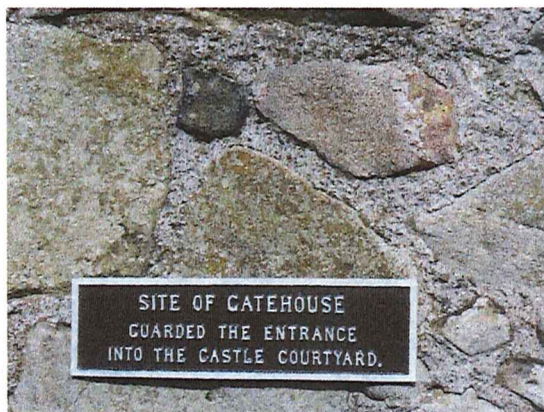
The railway station was built in 1890 when the rail link from Burntisland to the new Forth Railway Bridge was established.

The building is made of sandstone from various sources. The cream-coloured sandstone is most likely from Cullaloe near Aberdour, while the red stone is possibly from the Lothian or the Kirkcaldy areas.

The cut blocks are called "ashlar", in contrast to rubble walls seen later on.

<Walk towards the castle. At the main entrance to the castle, walk 75m until you reach the plaque which states "Site of Gatehouse".>

Locality 2



At this site, the wall is made up mostly of sandstone but just above the plaque there is a dark-coloured rock showing six-sided symmetry - it is part of a basalt column which adopts this shape as the magma cools.



This curved part of this random rubble wall is made up of assorted sandstones, some grey, some brownish.

Locality 3

<East from the "Gatehouse" plaque, there is another plaque on the wall which states "Site of Gateway".>



This rubble wall is made up mostly of igneous rock of various compositions (basalt, dolerite), with a few sandstone blocks. Those with rounded edges have probably been scavanged from the local fields and beaches.

<Retrace your steps along the drive out of the castle grounds. Follow Shore Road down towards the sea and round to the left until you reach Aberdour Boating Club and a Fife Council sign for the harbour.>

Locality 4



A small cliff exposed on the left side of the path (opposite the Boating Club) shows layered sequences of sandstone (sst) and volcanic ash (v).

The ash was erupted into the air from a local volcano and then fell out of the sky into water before being buried by sand.

<Follow the footpath around the harbour, crossing a small river, then go down onto the sandy beach using either the concrete ramp or a set of steps. Turn away from the harbour to a low cliff on the left. BEWARE. THE ROCKS CAN BE SLIPPERY.>

<From the steps, walk 35 paces or metres along the top of the beach.>

Locality 5a

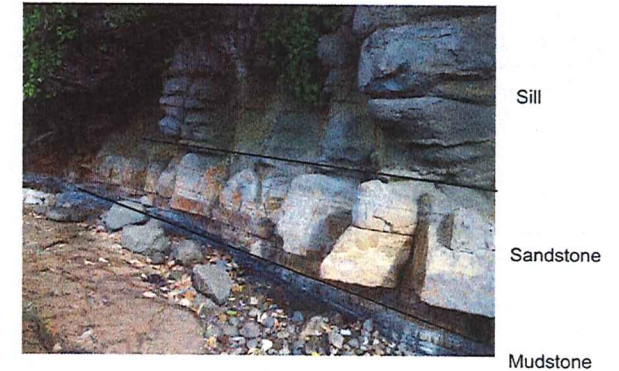


Exposed in a small cliff face is a good example of a fault - a dislocation of the rock layers during earth movements. Earthquakes would have occurred during the fault movements.

The yellow line shows the position of the fault. The yellow arrows indicate the relative direction of movement - downwards on the right and upwards on the left of the fault. This can be worked out by the relative position of the grey mudstone layer on each side of the fault.

<From this locality, walk 15 paces or metres further along the top of the beach.>

Locality 5b



In this cliff section can be seen a sequence of layers of mudstone (laid down in muddy water), covered by a layer of sandstone deposited in rivers and deltas.

This sequence of sediments was then intruded by molten rock (magma at ~1000°C) which forced its way through the rock layers about 330 million years ago, forming a feature known as a sill. The base of the sill is exposed here and has a greenish-grey colour. This rock has vertical cracks in it, but no layering.



<This sketch shows how a sill is formed when magma squeezes into pre-existing rocks and spreads out horizontally from a feeder pipe (shown on the right). Occasionally a sill will take a step up or down to create a kink.>

Locality 5c



The zone between the Sill and Sandstone appears disrupted. This was caused by the forceful intrusion of molten magma into the pre-existing sandstone layers. Some molten material was squeezed into cracks, and some pieces of sandstone were plucked and caught up into the molten magma.

View to Locality 6 (*) →



Aberdour harbour with sandy beach beyond.

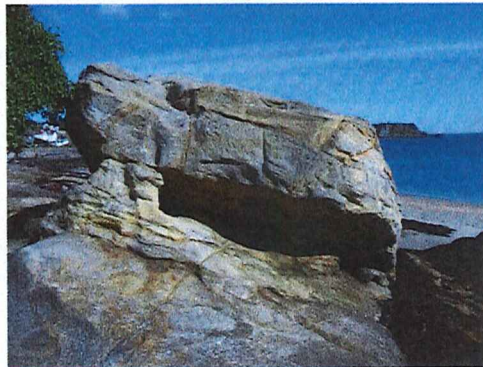
Locality 5d

Nearby there is an exposure of the sill which has been altered by the weather. The rounded shapes are described as “onion weathering” where the corners of the jointed blocks are corroded quicker than the bulk rock. Onion weathering is characteristic of dolerite rock.



<Retrace your steps back past the harbour and Locality 4, along The Shore and walk onto the sandy beach. Follow the wall towards a rock stack.>

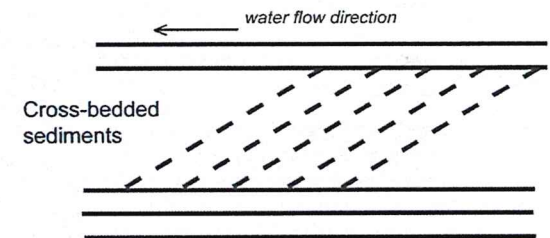
Locality 6



This rock stack shows the effects of wind and rain erosion on soft sandstone. The middle layer has been worn away to leave a hole.



The rock next to the hole shows evidence of how the sandstone was laid down. The layers show changing angles (indicated by solid black lines for the bedding plane and by dotted lines for the cross-beds), which indicate the way the water was flowing at the time the sands were deposited (from right to left) in a meandering river channel. The whole block has been tilted by later tectonic forces.



<Retrace your steps back to the road end of Shore Road.>