

Soil Alert

Potentially acid sulphate peats

On the National Soil Map of England and Wales, soil in peats that are potentially acid sulphate (sulphidic) occur within the following associations:

1024a – [Adventurers' 1](#)

1024b – [Adventurers' 2](#)

1025 – [Mendham](#)

Peat soils incorporating organic marine sediments may contain pyrite (FeS_2) and are classed as potentially acid sulphate (sulphidic), meaning they have the potential to become very strongly acid when exposed to air. Data from the National Peat Inventory in Cambridgeshire's Fenland in 1982–86 revealed that 30 per cent of the peat soils in 1,600 auger-bore records had an acid sulphate layer within 80 cm depth. These conditions are also common on the Norfolk Broads and the Waveney valley, but may be found in any low-lying peats which have organic marine sediments at depth.

As long as these pyrite-rich sediments remain waterlogged the pH remains near neutral. When the peats are drained or excavated, oxidation occurs and the pH falls to a value of around 4 or below. Under these conditions iron ochre is produced, heavily staining water and blocking drains. Also, as the pH falls aluminium becomes increasingly soluble and available to plants at levels that can be toxic to plants, fish and other aquatic organisms. Metal and concrete structures are also at risk of corrosion under these acid conditions.



Ochre in Fenland drains and watercourses © Rodney Burton

If lowland peat soils in soil associations or series identified as potentially acid sulphate are to be drained or excavated (for example for creation of wildlife ponds, landscaping or habitat translocation), a detailed soil survey with soil testing is essential. To detect soil material likely to acidify on exposure to air, the pH is measured when newly sampled (preferably in the field). A duplicate sample is retained and kept moist with distilled water for 1-3 months. A significant fall in pH over this period indicates that the soil material has a potential to acidify if drained or exposed.

Management of peat in stockpiles differs from that of mineral soils. Peat identified as potentially acid sulphate should be stored in an environment that will reduce or eliminate acidification, either by keeping it wet or covering it with impermeable sheeting. This will also protect it from irreversible drying and wind erosion. Any stockpiled organic soils are at risk from spontaneous combustion and should be monitored accordingly.

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Individual soil series affected by this soil alert:

[10.24 Adventurers'](#)

[10.24 Martin Mere](#)

[10.25 Mendham](#)

[10.25 Prickwillow](#)

A useful reference for peat soils is Burton, R.G.O and Hodgson, J.M. (1980). *Lowland Peat in England and Wales*. Harpenden. This can be purchased from [LandIS](#).