The Deployment and Risks Associated with Different Types and Combinations of Earth Moving Equipment in the Restoration of Functional Soil Profiles: An updating of the UK Guidance

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Importance of Soil Handling in Restoration and Reclamation of Mineral Sites

- Soil conservation and replacement likely to be key factors in the sustainable use of land and ecosystem service provision following mineral extraction
- The earth-moving equipment and the methodology used likely to determine the character and functioning of the rehabilitated soil ecosystem

UK MAFF 2000 Guidance

Aim to contribute to the ongoing improvement in restoration standards and the sustainability of minerals and waste development

- Sheet 1: Soil Stripping with Excavators and Dump Trucks (108 KB)
- Sheet 2: Building Soil Storage Mounds with Excavators and Dump Trucks (99 KB)
- Sheet 3: Excavation of Soil Storage Mounds with Excavators and Dump Trucks (246 KB)
- Sheet 4: Soil Replacement with Excavators and Dump Trucks (122 KB)
- Sheet 5: Soil Stripping with Towed Earth Scrapers (90 KB)
- Sheet 6: Building Soil Storage Mounds with Towed Earth Scrapers (71 KB)
- Sheet 7: Excavation of Soil Storage Mounds with Towed Earth Scrapers (65 KB)
- Sheet 8: Soil Replacement with Towed Earth Scrapers (109 KB)
- Sheet 9: Soil Stripping with Self-Propelled Earth Scrapers (85 KB)
- Sheet 10: Building Soil Storage Mounds with Self-Propelled Earth Scrapers (71 KB)
- Sheet 11: Excavation of Soil Storage Mounds (63 KB)
- Sheet 12: Soil Replacement with Self-Propelled Earth Scrapers (104 KB
- Sheet 13: Soil Stripping with Bulldozers and Dump Trucks (124 KB)
- Sheet 14: Building Soil Storage Mounds with Bulldozers and Dump Trucks (125 KB)
- Sheet 15: Soil Replacement with Bulldozers and Dump Trucks (123 KB)
- Sheet 16: Release & Removal of Stones and Damaging Material from Excavator Replaced Soils (40 KB)
- Sheet 17: Release & Removal of Stones and Damaging Material from Scraper & Bulldozer Replaced Soils (42 KB)
- Sheet 18: Soil Decompaction by Excavator Bucket (38 KB)
- Sheet 19: Soil Decompaction by Bulldozer Drawn Tines (199 KB

http://webarchive.nationalarchives.gov.uk/20090317221756/http://www.defra.gov.uk/farm/environment/land-use/soilguid/index.htm

Sorry, but this presentation is NOT about earth-moving equipment and their usage

It is about*

- The cyclic nature of knowledge and how it may affected policy and practice,
- And, why it is timely to update the UK soil handling guidance

* *we will be writing a technical paper for JASMR later*

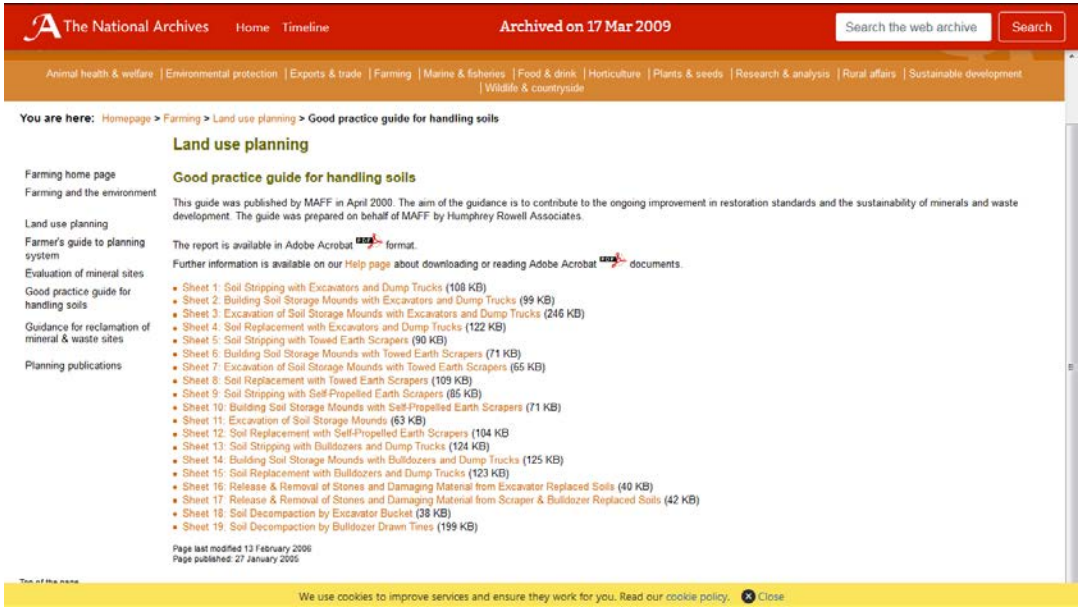
Natural Cycles and Life-Spans in Knowledge?

- It has been suggested that there is a natural and cyclic life span to our knowledge and its application, and that's why we are forever 'reinventing the wheel' **#**
- Natural cycles tend to occur when key and leading players, and their cohorts, associated with issues of their time, move, retire and when priorities and agenda change
- Also, cycles can be related to the time-limited extent of knowledge reach; because of convenience or inherent limitation of the tools used
- But, also, cycles in administrative responsibility and agenda

*R N Humphries, JASMR, 2016, 5, (2), 2pp.*

MAFF guidance as currently archived

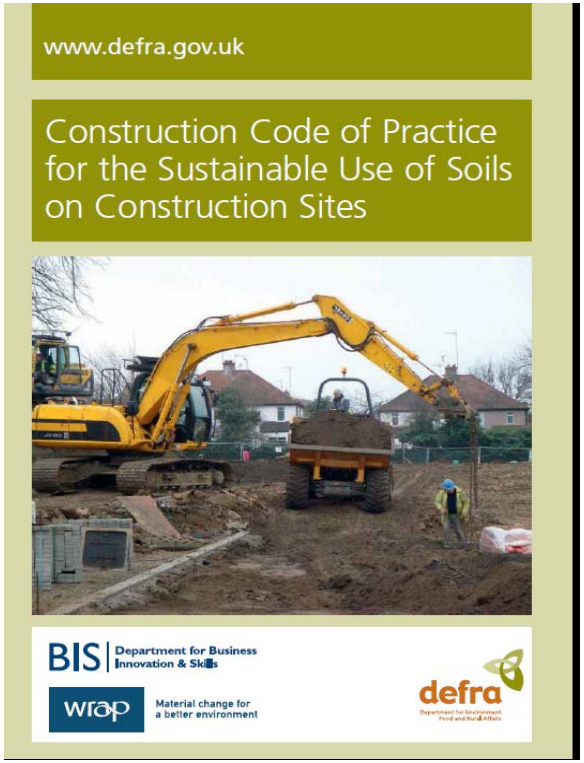
MAFF published an agreed UK best practice for soil handling guidance in 2000 after 30 years of debate and counter research and field experience, but only to be archived in 2009



Replacement DEFRA 2009 Guidance

So, what happened?

- Change in governing political party in 1999 resulted in disbanding MAFF and DoE, and replacement in 2002 as combined DEFRA.
- Built environment & brownfield land became greater focus than agricultural resources and so current UK soil handling guidance published in 2009



Outcome of Bias to Construction Sites

- DEFRA guidance leaves soil handling practice to constructor
- Resulted in an alternative to MAFF guidance, a construction site-based (said to be quicker and cheaper) methodology becoming widely practiced in the mineral sector and uncritically accepted without reference to MAFF 2000

Developing Concerns (1)

Loss of mineral industry knowledge-base -

- MAFF guidance still very widely used, even for major infrastructure projects (eg HS2), but accessible to those who know where to find it
- Aging soil specialist's, mineral planner's/regulators and mineral operator's with knowledge of reasons for MAFF 2000 and its soil handling practices and outcomes

Developing Concerns (2)

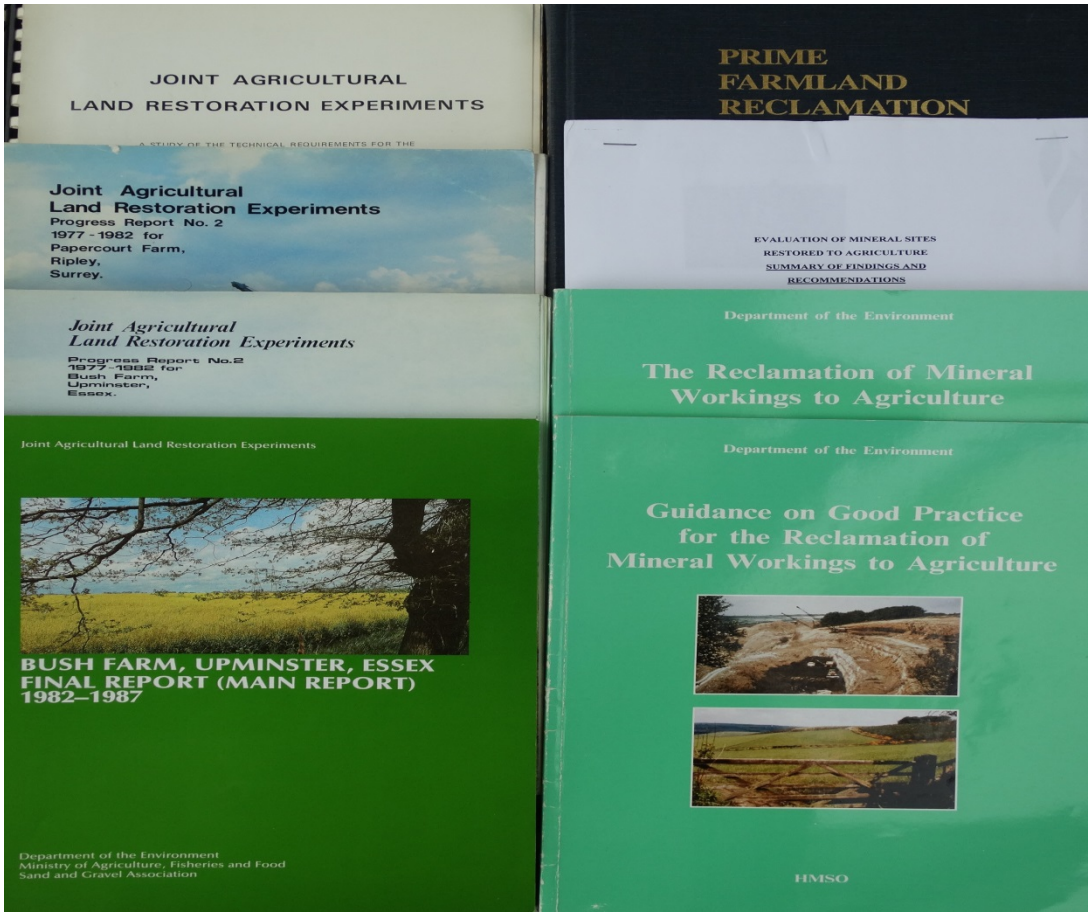
- Inferior practices are now being used and accepted that have no rationale for mineral sites
- The knowledge-base and lessons learnt in the 1970s-1990s could be lost and have to be relearnt

Action to Address Past Deficiencies

- Mineral industry through the Institute of Quarrying to taking ownership and its use for training purposes for the next generation
- Make the updated guidance as the easily accessible UK reference material
- Input to the update includes soil-science specialists, company soils and restoration professionals, and mineral planners and their statutory advisors before they retire

Natural Life-Span of MAFF 2000 Soil Handling Guidance

- Without the joint initiative of the Institute of Quarrying and Natural England, MAFF 2000 would have run its Life-span
- Sometime in the future as restoration outcomes again became unsatisfactory, the knowledge cycle would have had to be restarted and reinventing the past 50 years of accumulated knowledge
- The joint initiative should enable a long Life-span without the occurrence of disruptive cycles



Thank You

A near-miss

30 years worth of evidence nearly forgotten