Current Approach to Dredged Material Assessment in England and Wales:

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N.B. Just covering assessment of the suitability of Dredged Material for disposal at sea

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Cefas Role

- Technical advisor to Marine Management Organisation (MMO) for marine licensing
- Role is to provide independent scientific / technical advice on dredged material applications to assist the MMO in making decisions, ensuring:
  - environmental risks identified
  - evidence to back up the prediction of impact
  - robust information upon which to make a decision
- We draw upon a range of experts within Cefas e.g. chemistry, benthic ecology, ecotoxicology, fisheries and coastal processes

Dredged Material Assessment

Two part process:

- Information gathering
  - From the application form
  - Plus what we already know about the dredge area and the disposal area
- Detailed assessment
  - What are the environmental implications likely to be and are they acceptable?

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Information Gathering

- Nature of dredged material
- Dredge areas - history of site, possible contamination
- Method of dredging and disposal
- Disposal site characteristics

Nature of Dredged Material

- Quantity
  - Concerns are, can the disposal site cope with the quantities and types of material involved
- Tier 1. Physical properties
  - Silt, sand, gravel, clay
  - Concerns are how the material will behave once disposed to sea
- Tier 2. Chemical properties
  - Routine testing for potential contaminants following OSPAR guidelines
  - Concerns are toxicity, persistence and tendency to bioaccumulate in the marine environment

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Chemical Properties

- Arsenic
- Cadmium
- Chromium
- Copper
- Mercury
- Nickel
- Lead
- Zinc

- PCB's (25 congeners)
- Tri-butyl tin compounds
- Polycyclic aromatic hydrocarbons (PAHs)
- Above need not be determined when:
  - no known sources of contamination and
  - sediments are coarse and/or
  - levels of organic carbon are low.

Other determinands may require analysis based on local information or historic inputs

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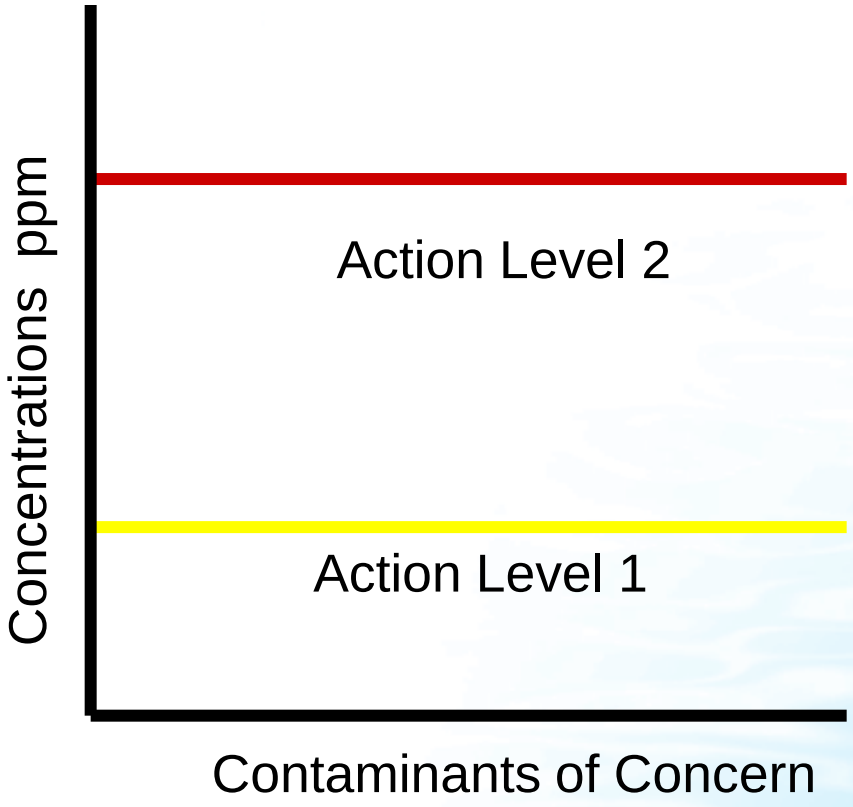
Action Levels



ACTION LEVELS		
Contaminant / Compound	Action Level 1	Action Level 2
	mg/kg Dry Weight (ppm)	
As	20	100
Hg	0.3	3
Cd	0.4	5
Cr	40	400
Cu	40	400
Ni	20	200
Pb	50	500
Zn	130	800
Organotins; TBT DBT MBT	0.1	1
PCB's, sum of ICES 7	0.01	none
PCB's, sum of 25 congeners	0.02	0.2
*DDT	*0.001	
*Dieldrin	*0.005	

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Background Trace Element Levels – Defra funded R&D Project AE0257

- Background levels established for As, Cd, Cr, Cu, Ni, Pb and Zn for most ports around England and Wales that require dredging and disposal of dredged material.
- Significant variation of 3 (Cr) to 17 (Cu) times in recommended background values for the elements around the various ports.
- Mineralised catchments e.g. Cornwall/Devon and North-East England clearly give high background values for most elements.
- Therefore, highly inappropriate to use a single background level for these elements for England and Wales

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Sediment Bioassays

- Sediment bioassays developed:
  - 2 acute tests – *Corophium volutator and Arenicola marina*
  - 1 chronic test - *Leptocheirus plumulosa*
- Bioassays trialled for dredged material assessment purposes
- However, have not been adopted for routine use due to concerns about reliability

NB The Netherlands used bioassays for a few years and then dropped them from their testing procedure

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Assessment and Advice

- Interpretation of collected information
  - Examination of most likely environmental problems
  - Consideration of mitigation options
- Advice provided to MMO
- Assessment of compliance of dredging with Water Framework Directive– see http://www.environment-agency.gov.uk/business/sectors/116352.aspx

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Sediment Quality - Main Concerns

- **TBT** - despite ban on use on vessels > 25m, levels in sediments in some areas still have very high levels, particularly near dry docks.
- **Metals** - levels in sediments in heavily industrialised areas still contain high levels of for e.g. Zinc– historic contamination from mining.
- **Pesticides** - of concern where agricultural runoff is high. Still finding high levels of DDT in some areas.
- **PCBs** - historic contamination - extremely persistent.
- **PAHs** – historic contamination - genetic damage.

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Some Current Issues 1

- Risk Assessments - using the best methods?
  - What is the significance of contaminants, both those we analyse for and 20,000+ we don't. Should we develop screening tools?
- International pressure to develop sediment quality criteria – e.g. EU EQS Directive
- Compliance with the EU Waste Framework Directive

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Some Current Issues 2

- Are we succeeding in protecting man and the marine environment, and at an acceptable economic cost?
  - Evidence from surveillance monitoring – UKMMAS
  - Validation monitoring:
    - Are we doing enough?
    - More cost effective monitoring tools /methods?

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Thank You!

- **Any questions?**

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