



Magnox



Bradwell Accelerated Decommissioning Programme

Concrete reuse strategy

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FINALIST 2011

Waste Management





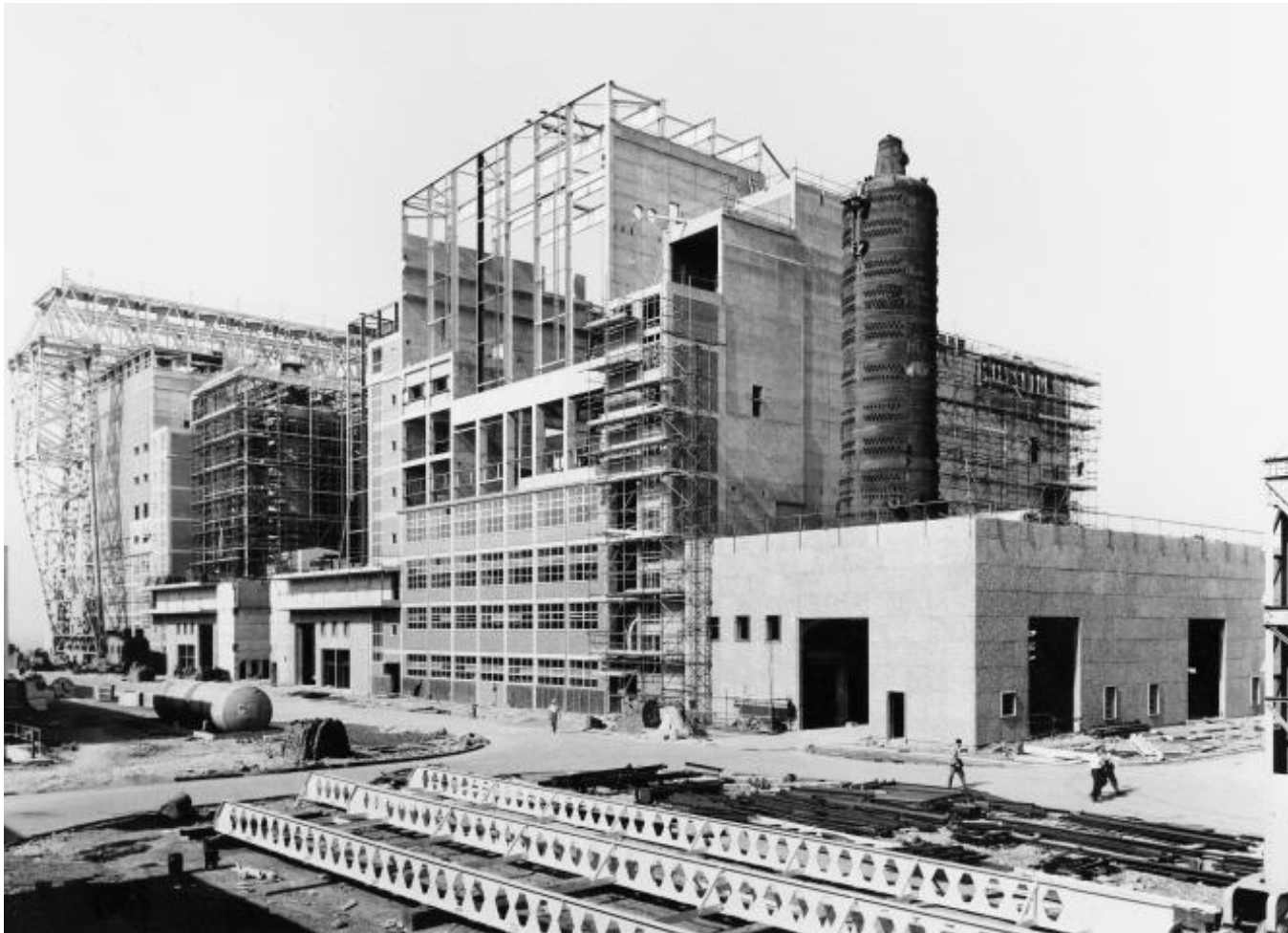
Site Overview

- Constructed 1956 – 1962
- Generated power until 2002
- Generated 60TWh over its lifetime
- Defuelling completed 2006
- 2011 – nominated for accelerated decommissioning programme (early entry into C&M)

Tasked to complete 17 years C&M Preps work in 4 years

Waste Management

During construction - 1958



Waste Management

During Operations



Waste Management

During C&M (2015)



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26/04/2012

Accelerated Decommissioning Programmes – material generators

- ILW Programmes (MIMP) – minor contributor
 - Construction of new ILW store
- Plant and Structures Programme – Major contributors
 - Undertakes most enabling works
 - Major construction areas (including portacabin installation)
 - Major demolition (minor building)
 - Recladding project.

Options for concrete

- Hazardous
 - Treatment and recycling off-site
- Non-hazardous
 - Recycling off-site (waste)
 - Reuse on-site (material - CL:AIRE CoP)
- Inert
 - Reuse on-site (material - CL:AIRE CoP / WRAP Quality Protocol (AGGREGAIN))
- Procedures are in place to identify suitable material at an early stage and ensure it is handled correctly to allow application of the waste hierarchy.

WRAP Quality Protocol

- Has been successfully used previously (CW voids, turbine hall basement partial fill).
- Phasing out due to limited near term building works
 - Limits on inputs (inert concrete / masonry only)
 - Limits on destination of material produced

CL:AIRE CoP

- Currently in use at Bradwell:
 - Generic site requirement to backfill large voids left by demolition (concrete / masonry only)
 - Project specific requirements that develop during design phase (can include concrete / masonry / soil)



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Comparison of acceptance levels

Substance	Inert WAC (for use in WRAP Quality Protocol)	CL:AIRE thresholds (based on Risk Assessment)
Chromium	0.5	5
Molybdenum	0.5	5
Nickel	0.4	4
Fluoride	10	100
Sulphate as SO ₄	1000	10000
Total Dissolved Solids	4000	10000

Waste Management

1. Does not contravene rWFD & 2. Material is suitable

- Material Management Plans (MMP) for disposition area
- MMP prepared within the waste management department and approved by independent CL:AIRE QP

- Suitable for use
 - **Chemical:** Site specific risk assessments (prepared externally) set acceptance limits (demonstrates no risk below these levels)
 - **Physical:** End-use specific engineering reports (engineering specification)

3 & 4 Quantity and Certainty

- Quantity
 - Mass balance of concrete / masonry identified in site waste inventory, against size of voids left by demolition
 - Project specific requirements (based on engineering design)
- Certainty - requirement for use is defined:
 - C&M Entry state definition document (CWPH voids filled and capped), Turbine Hall voids partially filled.
 - Engineering specification for filling voids
 - EIADR ES and T&CP ES commitment to reuse material on-site to fill voids



Waste Management

Turbine Hall Basement - 20,000m³ void



Waste Management

Cooling Water Pump House Voids

- 3 voids
- 1,500m³ each



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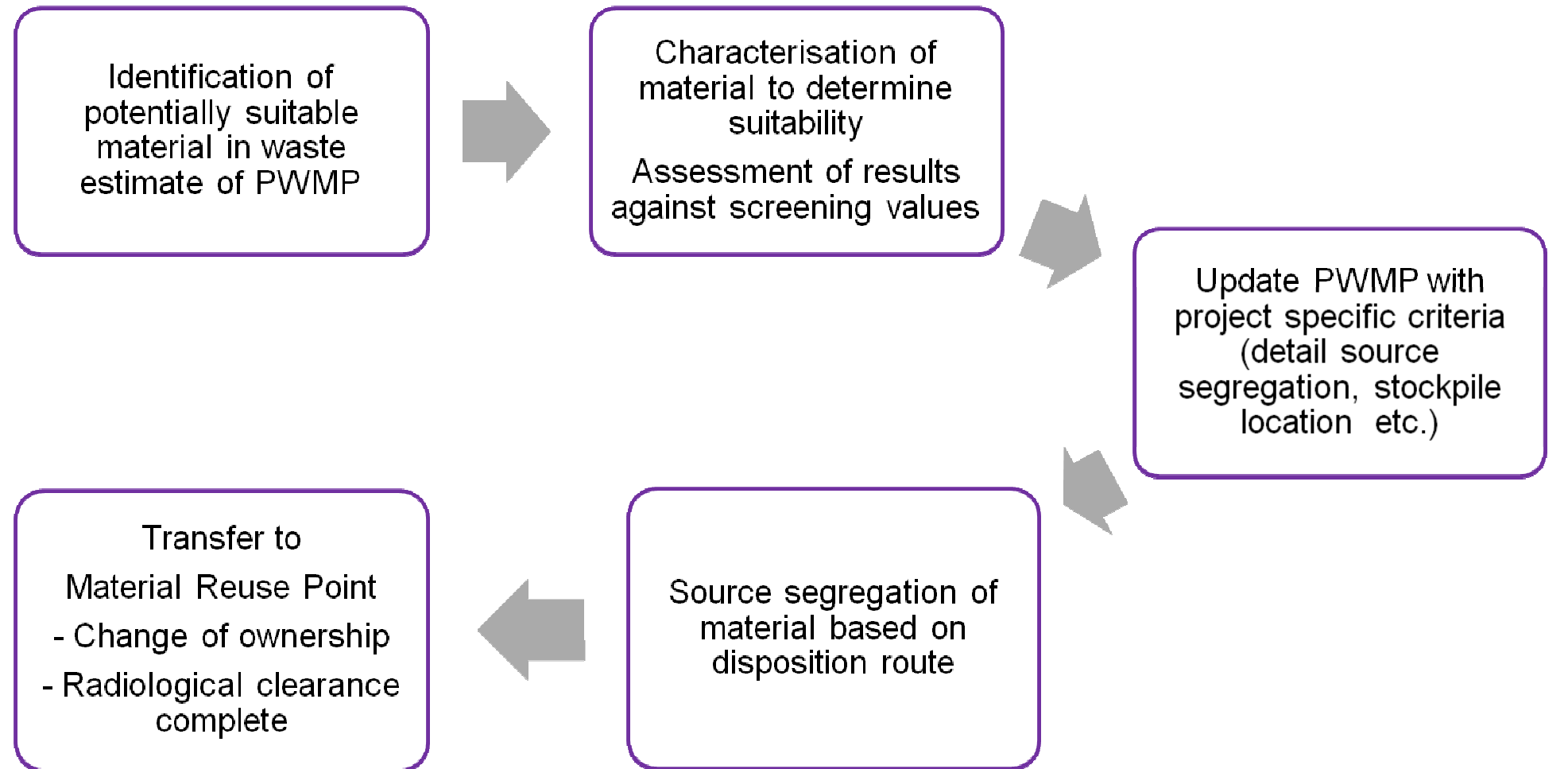
Site Voids' MMP

- Reuse of concrete generated across projects/site for filling voids
 - As long as it meets acceptance criteria.
- Chemical risk assessment for conditions (highly engineered)
 - allows higher acceptance thresholds

Project Requirements – ILW store piling mat

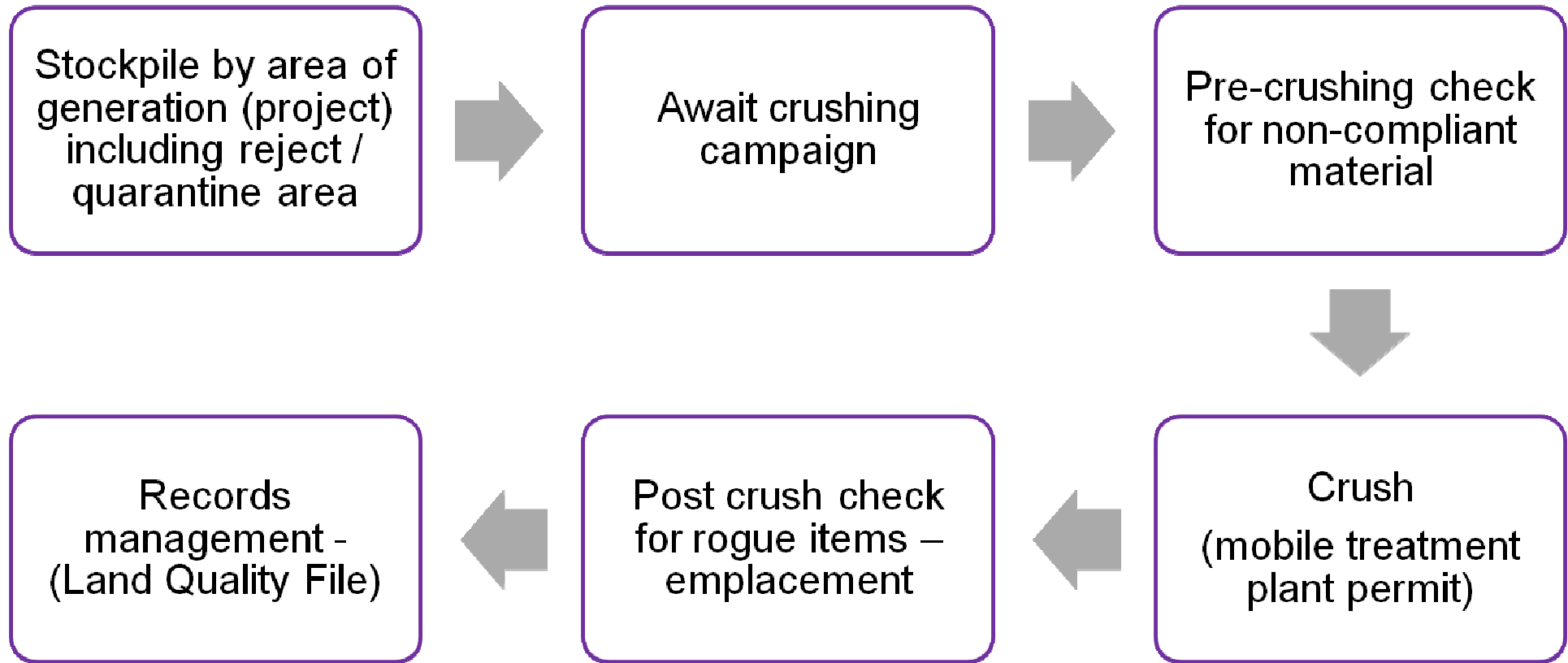
- ILW Storage Facility MMP
 - Reuse of soil and concrete under CL:AIRE CoP
 - 5,200m³ of material generated on-site and reused to form a piling mat for the store.
 - Generic risk assessment – material was inert
 - Requirement for material – detailed in engineering design

Project Process



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Reuse Process



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Benefits

- Fulfills legal obligation to follow the waste hierarchy (PREVENT)
- Cost saving - £100,000 on first project calculated (disposal costs and minimising purchasing)
- 360 shipments off the road (important to key stakeholders – the local community)
- Minimises carbon footprint
- No variation on Permit or exemptions required

Considerations prior to use

- Significant information required in advance – particularly characterisation.
- Large area of space required for stockpiling and crushing
- Needs to be identified at very start – no room for late notification from project

Future Potential

- Act as a CL:AIRE receiver site
 - Act as a CL:AIRE donor site
 - Increase what we can accept in our own voids
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- Lessons Learnt – could take better advantage by having an MMP prior to major building demolition.

Questions

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