



**Sellafield Ltd**

**A Nuclear Management Partners company  
operated under contract to the NDA**

# SAFESPUR Forum

## Re-use and recycling of crushed concrete aggregate

*Current practice in the nuclear sector –  
Sellafield Ltd.*

Date: April 3<sup>rd</sup> 2012

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Sellafield Ltd

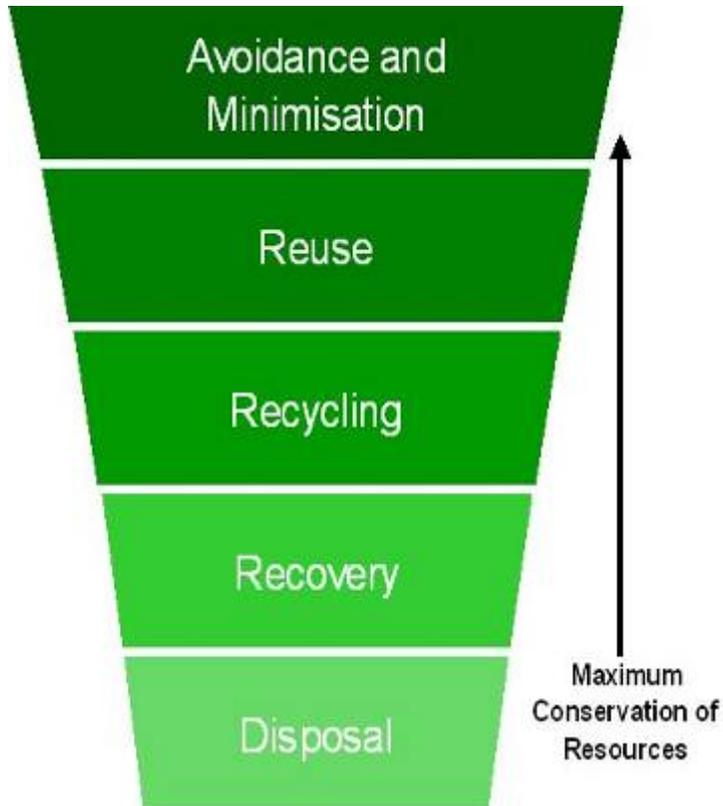
## Re-use and recycling of crushed concrete aggregate



- Estimated volume of **2,000,000 m<sup>3</sup> of waste concrete** arising over lifetime decommissioning of Sellafield Site alone.
- Bulk of which is likely to be clean/exempt waste.
- Unable to avoid waste production – it is already in existence - but we can **re-use!**

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# Re-use and recycling of crushed concrete aggregate



- Opportunity to apply Waste Management Hierarchy
- Established principles and cornerstone of Waste Management Legislation.
- Most preferred option is highest, least preferred option lowest.

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# Re-use and recycling of crushed concrete aggregate

Current options for re-use of waste concrete 1:  
Hardstanding / Landscaping for new projects



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## Current options for re-use of waste concrete 2:



- Concrete re-use on Sellafield Site primarily for landscaping purposes. (Calder Cooling Tower basins shown)
- Haul road comprises re-used aggregate
- Trial undertaken on Sealine concrete covers.
- Identified/confirmed other uses possible.

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## Re-use and recycling of crushed concrete aggregate

- Large amounts of potential reuse of construction concrete
- New build programme to support the decommissioning of Sellafield Ltd
- Opportunity for new build to embrace best practice in waste management
- Could contain chlorides due to the coastal marine climate over >60 years exposure.



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## Demolition of iconic nuclear structures



- Demolition material classified as either Exempt or VLLW.
- The standard BS8500-2 offers a specification with quality requirements for the uses of recycled concrete aggregates.
- With a vast range of recycled aggregates an all encompassing guidance for the use of RCA is yet to be determined.

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## Re-use and recycling of crushed concrete aggregate

But there are difficulties...

Recycled Aggregate (RA) or Recycled Concrete Aggregate (RCA) **are not permitted** as aggregate for Structural Concrete and Shielding Concrete in Sellafield Ltd. specifications.

However, RA/RCA may be used for **non-structural** purposes such as mass concrete fill, support for hard landscaping ( e.g. Mass concrete, road sub-base, blinding, screeds and fill) are applications which could meet Sellafield Ltd specification depending on application.

But for the use of RCA there is no **trend at present** and **no timeline** for Building Demolition at Sellafield site.

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Sustainable concrete design using PFA up to 40% & GGBS up to 70% is well established and permitted in new structural concrete.



Casting GGBS Concrete at Sellafield

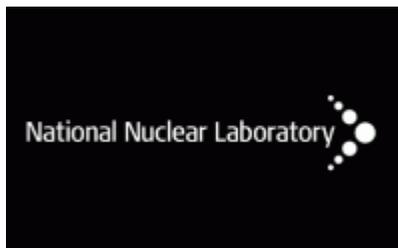
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# Re-use and recycling of crushed concrete aggregate

- NNL - Potential for grout filling of encapsulation wastes drums using Fine Recycled Concrete Aggregate
- Performed by NNL with funding provided through the NDA's Direct Research Portfolio



Decommissioning waste infilled with PFA:OPC is the type of application for FRCA.



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# Re-use and recycling of crushed concrete aggregate

## FINALLY – Discussion Issues

- LLWR applying sustainable principles for wastes receipts
- Recycling/reuse on nuclear sites is preference by Regulators
- Quality of aggregate arising not established (testing?)
- Would Contractor take risk/responsibility for site RCA (testing?)
- Supply uncertain for increasing number of new construction projects – try to match supply with demand
- >NNL - Potential for grout filling of encapsulation wastes drums using Fine Recycled Concrete Aggregate

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