

LLW Strategic Review Summary

Introduction

UK Nuclear Waste Management (UKNWM) Ltd. undertook a Preliminary Strategic Review as part of preparation of the Low Level Waste Repository (LLWR) tender in 2006. This preliminary review identified a number of potential opportunities to improve Low Level Waste (LLW) management across the UK.

Given that the Preliminary Strategic Review was undertaken in 2006 there is a need to update this analysis based on the current situation in 2008. The updated Strategic Review identifies and evaluates a number of synergies and opportunities to reduce NDA's LLW liabilities by more than 10%. This will inform the development of the Nuclear Industry LLW Strategy and National LLW Management Plan in 2009.

Developing the 2008 LLW Baseline

Developing a baseline is critical to understanding how waste is currently managed and enables identification of potential improvements to optimise the system. The 2008 LLW Baseline has been established by drawing together information in Lifetime Plan (LTP) 2008 submissions and the 2007 National Radioactive Waste Inventory for each site to form a complete UK picture.

The LLW baseline is a function of each site's LLW management strategy, LLW inventory arisings, costs and liabilities associated with LLW management and (existing and planned) assets and infrastructure for LLW management.

The 2008 LLW inventory predicts total raw arisings to be around 3 million m³ over the period 2008 and 2129 (the end of LLW generation). This covers a broad spectrum of activity levels and materials including concrete, rubble, soils, plastics, ferrous and non-ferrous metals, and cellulosic materials. This does not, however, include large volumes of potentially-contaminated land yet to be characterised. Approximately 60% of the current inventory has been

declared as Very Low Level Waste (VLLW) or mixed LLW/VLLW.



All NDA sites reference application of the waste management hierarchy principles as a core part of their waste strategy; however, there appears to be significant variation in the practical application of these principles. For the majority of sites, the current baseline disposal strategy for LLW is high-force compaction (where applicable) followed by disposal to the LLWR near Drigg in Cumbria. The LLWR is the main facility in the UK for disposal for LLW. A smaller on-site disposal facility for LLW and VLLW is to be constructed at Dounreay. A commercial landfill facility at Clifton Marsh is able to accept relatively significant quantities of VLLW (and small quantities of LLW) from Springfields and Capenhurst. There are also a small number of other landfills around the UK able to accept small quantities of VLLW from nuclear and non-nuclear industry sites.

A number of sites are considering opportunities to reduce volumes or dispose of waste to alternative facilities, in accordance with the broader options now available under the Government's LLW Policy. For example, sites such as Dounreay, Magnox, Springfields, Sellafield, and Harwell have been evaluating the potential to dispose of some decommissioning wastes on-site.

The remaining volumetric capacity at LLWR is around 0.7 million m³, subject to planning and regulatory approvals. Based on the projected waste arisings, current management strategies and available routes, a new LLW repository (LLWR 2) could be required by the mid-2030's, or possibly even earlier if waste currently destined for other facilities had to be disposed to LLWR.



Typically all nuclear industry sites have some small-scale sorting & size reduction processes and equipment in addition to monitoring equipment and facilities for loading and packing of containers. Most sites also have access to a high-force compaction services at Sellafield.

In addition to compaction, some sites employ other wet or dry decontamination equipment ranging from small-scale mobile equipment to larger industrial-scale fixed plants such as the Wheelabrators at Sellafield. A number of NDA and non-NDA sites have operational incinerators, primarily for their own waste or the adjoining reactor station. A number of commercial LLW treatment facilities are currently available to waste producers both in the UK and overseas. These services use technologies such as supercompaction, incineration, and metal melting.

Despite the availability of techniques, facilities, and a supportive regulatory regime under the LLW Policy, there are still large volumes of potentially treatable material disposed to LLWR without significant volume reduction. Part of the reason for this may be the perceived difficulty of opening new routes, lack of

authorisations, and absence of financial incentives compared to disposal.

LLW represents a significant proportion of NDA's overall liabilities. The undiscounted costs in NDA's LTPs for management and disposal of solid LLW generated by operations and decommissioning of NDA's sites is currently estimated at just under £10 billion. This includes the design, construction, operation, decommissioning of any solid LLW management facilities required in addition to the cost of treatment (characterisation, packaging, conditioning, etc), transport, and waste disposal itself.

Approximately £2.8 billion is currently included within consignors LTPs for off-site disposal of LLW and VLLW; however, this may not necessarily represent the true lifecycle cost liability of LLWR and LLWR 2 that NDA will ultimately incur. The baseline primarily focuses on identifiable solid LLW and VLLW costs residing within every NDA site's LTP08. It is possible that other LLW costs may be embedded elsewhere (e.g. in decommissioning projects or contaminated land remediation) and hence are not currently included in the LLW baseline.

The baseline can be used as a benchmark for measuring the effectiveness of potential improvements to LLW management. However, it is recognised that there are a number of issues that need to be addressed, the most significant being uncertainty in the LLW inventory.

Identification of Synergies and Opportunities

The LLW baseline has been evaluated to identify where opportunities and synergies exist to reduce NDA's cost liabilities by more than 10% through integration of waste management on a national, regional or multi-site basis. This has included a detailed cross-cutting review of LLW opportunities identified within LTPs for each site to identify common themes and issues.

Fifty-four potential strategic initiatives have been identified which could provide significant opportunities in the following areas:

- Application of the waste hierarchy
- Waste packaging
- Waste transport
- Waste tracking and inventory management

These initiatives have been qualitatively evaluated using strategic criteria such as the ease of implementation, potential timescales, and the magnitude of the cost-benefits. Based on the qualitative evaluation, opportunities have been prioritised and separated into potential 'quick-wins' (i.e. the initiative could be implemented relatively easily and quickly) and those that require significant further work to assess and/or determine how to implement the opportunity.

Collectively, implementation of these initiatives could produce a step-change improvement in LLW management practices across the UK and contribute significant savings of over £3 billion to the LLW baseline. It should be noted that the impact of many initiatives may overlap which could enhance (or negate) the cost-benefit of others. This would have to be considered further when defining more detailed implementation plans and/or business cases.

At this stage, potential cost savings from implementing these initiatives have been qualitatively assessed to aid prioritisation. However, where appropriate, more

detailed modelling will be undertaken to underpin and quantify lifecycle savings. These initiatives have been assigned preliminary 'owners' responsible for taking the initiatives forward and, where appropriate, developing implementation plans.

Plans will be developed in accordance with NDA's Value Framework process and the policy, legal and regulatory frameworks. These implementation plans will be documented in a National LLW Management Plan which will set out how the NDA LLW Strategy will be implemented.

Next Steps

It is intended that these arrangements will be consulted with stakeholders at the National LLW Strategy Group and that this forum will be used to report and track progress of key initiatives on a periodic basis. Over time, the status of these issues will be kept under regular review as the changing funding, regulatory and strategic environment may impact on priorities going forward and identify additional initiatives to improve LLW management.

The Nuclear Industry LLW Strategy and National LLW Management Plan are due to be published in 2009. It is currently intended that the LLWR SLC will undertake further LLW Strategic Reviews every two years in order to revisit earlier conclusions in light of developments within the wider industry decommissioning programmes and changes in the waste management policy and regulatory framework.

Further information on the LLW Strategic Review and the development of the National LLW Strategy can be found on the National LLW Strategy Group website at:
www.llwrsite.com/LLW-Strategy-Group