

# Exotic Fuels and Nuclear Materials - Dounreay

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## **Stakeholder comments in response to Credible Options**

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**May 2012**

## Executive Summary

The concept of co-location of nuclear materials was raised in our Draft Strategy in 2010, and was subject to a 12-week public consultation. More detailed plans were also raised in our Draft Business Plan, also in 2010, which was published for an 8-week public consultation period.

We have previously published credible/preferred options paper and the subsequent decisions on the management of exotic materials at Harwell, and the DFR Breeder material at Dounreay. This credible options paper considered the other exotic materials currently stored at Dounreay separately from the DFR Breeder material.

The Credible Options paper on the potential management options for the Exotic material currently located at Dounreay was published on 7<sup>th</sup> February 2012, and stakeholders were asked to submit any comments via the NDA website before 23<sup>rd</sup> March 2012.

The paper discussed the strategic and high-level economic issues associated with the management options for these materials, and highlighted two potential credible options for the management of exotic fuels and nuclear materials currently stored on the Dounreay site:

- continue to manage them at Dounreay, which would require the construction of new fuel storage facilities and together with the deployment of associated site security arrangements; and
- transport them to Sellafield for future management in existing or modified facilities, with potential savings of between £300-500M, depending on the details of future management and transportation modality.

13 sets of comments were received from stakeholders during this period and are shown below, along with our response to each comment.

Comment	Organisation / Individual	NDA Response
<b>General Comments</b>		
In order to reduce the amount of material stored at the Dounreay site we would support the option to transport the exotics to Sellafield for management, on the basis that transportation to safe storage is	Orkney Islands Council	Noted. In order to improve our understanding of the strategic options, we are taking specific security advice from Regulators on the most secure method of transport for each material type, and we will act on that advice.

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by road or rail, not by sea or air.		
The Council agrees with the credible options. Should the decision be taken to transport the material to Sellafield, it is the Council's preference for it to be moved by rail as opposed to road.	Highlands Council	Noted. In order to improve our understanding of the strategic options, we are taking specific security advice from Regulators on the most secure method of transport for each material type, and we will act on that advice.
It is the Council's long-standing policy that legacy wastes and other material should be safely managed at Dounreay and not transported to other sites.	Shetland Islands Council	Noted.
Why are these exotic fuels and other materials not classified as wastes, as the credible options presented do not involve any reprocessing or re-use, but rather treatment and management similar to other wastes?	Shetland Islands Council	The "exotic" fuels individually are irradiated oxide fuels, plutonium and MOx powders, and separated uranium. All of these materials fit into a much larger UK inventory, which is currently under strategic review, and options for the recycle of all or some of this inventory are being explored at this time (for example HMG's stated preferred policy of recycle for plutonium). These materials are not considered to be wastes while the options for recycle are under review. All of these Exotics fuels have energy value tied up within them.
The NFLA strongly opposes the proposals to transport this material to Sellafield on both security and environmental grounds.	NFLA	Noted. We are taking specific security and environmental advice from Regulators on the management options for each material type, and will consider that advice in our final decision making.
Moving the materials from Dounreay to Sellafield to be managed effectively seems to be a logical approach.	Individual #1	Noted.
I strongly support the conclusions of the paper in identifying the option to	Individuals #2 and #3	Noted.

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transport to Sellafield for management as the “preferred” option.		
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<b>Stakeholder Engagement</b>		
There is concern regarding the piecemeal approach that appears to have been adopted with regard to a number of NDA documents that have been published recently.	Cumbria County Council	Prior to the adoption of Strategy II there was consultation regarding the policy of co-location of nuclear materials. The implementation of the Strategy has led to a number of individual engagements in a relatively short space of time to take account of operational opportunities across the sites. The NDA does recognise the burden such regular engagements place on Local Authorities and is working with local councils to see how this can be addressed. The development of forward looking overall programmes in other areas of Strategy II implementation should help in this regard but was not possible in this particular instance.
Engagement with the relevant local authorities needs to cover the wider context of the range of potential proposals and associated issues about which discussions have already commenced.	Cumbria County Council	Noted and discussions are ongoing.
Copeland would suggest that this consultation as a form of ‘engagement’ is too limited and generic to qualify as meaningful engagement and would recommend that further consultation is required with the affected local communities before any decision can be made.	Copeland Borough Council	Due to the security sensitive nature of the exotic fuels, it is difficult to put much more information into a public facing document. It is unlikely that any further information will be able to be published on this topic. Within the bounds of the security regulations, NDA will continue to hold discussions with affected local communities over the coming months and years.
Copeland would stress the	Copeland	NDA has attempted to publish as much

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<p>need for early meaningful engagement and would suggest that the NDA adopt the open transparent approach used by the MRWS framework rather than the previous less positive consultation exercises such as the DFR Breeder consultation in November 2011.</p>	<p>Borough Council</p>	<p>information as possible about these exotic fuels within the security regulations. Papers are published as early as possible to allow for meaningful engagement, while ensuring that business windows of opportunity are not lost.</p>
<p>SCCORS welcomes the commitment on page 3 that SLC's and NDA will engage further, beyond March/April 2012, with planning authorities, among others, to understand their views and obtain any appropriate permissions to pursue a strategy for management of the material discussed.</p>	<p>SCCORS</p>	<p>Noted.</p>
<p>This appears to be little more than a 'tick box' exercise with the preferred option already identified before seeking stakeholder comment.</p>	<p>Shetland Islands Council; Dounreay Stakeholder Group</p>	<p>NDA has attempted to summarise the advantages and disadvantages of the various management options. In the case of Dounreay exotic fuels the study resulted, in NDA's opinion, in a strong case for one particular option to be favoured.</p> <p>However, NDA values stakeholder comments and wished to seek alternative views before any management decision is taken.</p>
<p>It is difficult to believe that now that the principle has been set for DFR breeder fuel to be transported by rail to Sellafield that the same outcome will not come from this engagement exercise.</p>	<p>Dounreay Stakeholder Group</p>	<p>There was a limited window of opportunity for the DFR Breeder strategy, which meant that work on its management options needed to be accelerated and be completed before the study on the other fuels was completed. The decision on DFR Breeder does not pre-empt the decision on the rest of the Dounreay Exotic Fuels.</p>
<p>It is unclear how the decisions relating to the fate of Breeder Material can be effectively</p>	<p>SCCORS</p>	<p>The decision on DFR Breeder does not impact on the options presented in the DSRL Exotics paper, except for use of the railhead terminal at</p>

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finalised when they are dependent on the fate of the material discussed in this paper.		Georgemas.
It would have been more helpful to have had one study considering all these different fuels and materials as the two studies are comparable with similar arguments for and against each option.	Shetland Islands Council	There was a limited window of opportunity for the DFR Breeder strategy, which meant that work on its management options needed to be accelerated and be completed before the study on the other fuels was completed. We wanted to engage stakeholders as soon as studies were ready for presentation and real options were on the table for discussion.
There has been a lack of a full consultation regarding these issues and the lack of complete information and documentation.	Shetland Islands Council; NFLA; SCCORS	<p>The overarching concept of co-location was consulted upon through the Draft Strategy public consultation from September to December in 2010, and again in the Draft Business Plan 2011-14 from December 2010 to January 2011.</p> <p>We have published these documents as an additional opportunity for stakeholders to submit their views before the NDA Executive take a decision on the way forward.</p> <p>Due to the security sensitive nature of the exotic fuels, it is difficult to put a lot of information into a public facing document. It is unlikely that any further information will be able to be published on this topic. Within the bounds of the regulations, NDA will continue to hold discussions with affected local communities over the coming months and years.</p>
Development of the options in this paper is a good example of where the NDA can add value by facilitating cross-SLC opportunities for the benefit of "UK Plc".	Individual #2	Noted.
The high level option to manage the exotics at Dounreay should	Individual #4	Noted.

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be the chosen option.		
Will any engagement take place with stakeholders who live along the transport route?	Highlands Council; Individual #4	<p>Communication with the communities along any transport route will be considered and acted upon at an appropriate level (in line with security regulations).</p> <p>It should be noted that transport of spent fuel and nuclear materials has taken place safely over a number of decades between Dounreay and other nuclear sites.</p>
In the publication "Radioactive materials at Dounreay" it is stated that the "expertise exists here" to manage all of the nuclear fuel at Dounreay.	Individual #4	<p>"Radioactive Materials at Dounreay" is a leaflet published by Dounreay Sites Restoration Limited". There is currently expertise available at Dounreay that enables safe storage of the exotic fuels at this time. Once the site moves into advanced decommissioning status, the skills base and workforce will necessarily contract. Ensuring the skills base for future management (other than continued storage) will be more difficult and expensive in the medium term.</p>

<b>Socio-Economic</b>		
Under socio-economics the value framework states that there is no meaningful difference between the options. The displacement of the burden of hosting these materials from one community to another has a positive impact on the community they are removed from and a negative impact on the community they are moved to. It is considered that this statement shows a lack of understanding of the fears and possible resistance within	Copeland Borough Council; Individual #4	<p>The comments are noted and the NDA does recognise the difference between impacts that can be clearly expressed in terms of volume, radioactivity inventory transport movements etc against the impacts on the perceptions of a community and the broader area. The interaction of these effects is quite complex and NDA felt that the subject could not be fully explored in a generally accessible public document. These latter considerations are, however, being separately discussed with planning authorities and local community representatives.</p>

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potential host communities.		
Increase in Sellafield business is stated as a socio-economic benefit, however, it does not articulate how the fuel will be reprocessed therefore it must be assumed that it will be held within storage and therefore have very limited benefit to the wider community. The benefits to the community would have to be provided through some form of community benefit contribution which could be partially funded through the saving achieved through reduced security arrangements at Dounreay.	Copeland Borough Council	<p>Noted.</p> <p>It is important to note that no money is actually saved. The benefits are that a future demand on HM Treasury will be reduced. So “savings” cannot be used in the way suggested.</p> <p>However, NDA does have a socio-economic strategy and appropriate investment in regions local to our site is considered carefully.</p>
There is no consideration of the socio-economic impact on the local community as the radioactive material inventory at Sellafield continues to rise. This might give the potential appearance of undermining the on-going MRWS process for siting a geological repository.	Copeland Borough Council	<p>Noted. If the strategic change is approved, there would be a very small increase in the radioactive material inventory held on the Sellafield site. As referred to elsewhere in this document, community impact considerations are subject to ongoing discussions.</p>
Moving the material provides an opportunity for the NDA to realise savings from the current decommissioning plan at Dounreay. The Council therefore expects the NDA to use some of its savings to support the longer-term inward investment programme for the Caithness and North Sutherland community.	Highlands Council; Dounreay Stakeholder Group	<p>Noted.</p> <p>It is important to note that no money is actually saved. However the benefits are that a future demand on HM Treasury will be reduced. So “savings” cannot be used in the way suggested.</p> <p>However, NDA does have a socio-economic strategy and appropriate investment in regions local to our sites is considered carefully.</p>
“No meaningful difference between options” should be reconsidered as a comment,	SCCORS	<p>Noted. In terms of impacts regarding jobs, radioactive inventory, volumes etc there are minimal impacts – the broader socio economic</p>



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<p>and a full analysis of the socio-economic impacts should be carried out</p>		<p>issues on both receiving and current potential host communities are considered as part of the NDA's wider overall activity in these areas. Indeed both Caithness and west Cumbria have been identified as priority areas for NDA socio-economic activity.</p>
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<p><b>Value Framework Analysis</b></p>		
<p>Within the document it states that "modern facilities are either under construction or planned at Sellafield." An explanation of which 'facilities' this refers to would be useful and help to clarify how the NDA consider that Sellafield can foreseeably handle the fuel i.e. are these facilities for reprocessing the fuels or storage?</p>	<p>Copeland Borough Council</p>	<p>There are several modern standard facilities which could be used for unirradiated fuel storage at Sellafield, including the new Sellafield Product and Residue Store, which has 2 further modules planned for construction over the next 10-30 years. The irradiated fuel would be stored within the THORP facility, and managed with the other spent oxide fuels.</p>
<p>In the value framework analysis it is stated that no new stores are needed (beyond that already planned). However, the types of material permitted to be stored are conditional and further investigation is required with the Local Planning Authority to establish the merits of this proposal. Before the NDA engage with Planning Authorities to pursue a preferred strategy it is considered that more recognition needs to be given to the burden that the Copeland community carries now and will continue to carry as these materials with the associated potential safety, security and environmental issues are left for</p>	<p>Copeland Borough Council</p>	<p>Discussions are already underway with planning authorities both in the areas of understanding the full range of planning changes/applications etc that may be necessary, community impacts that may arise and the broader issues regarding community acceptance and perception.</p>

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the local community to manage.		
If recycling takes place at Sellafield then those operations should be carried out in such a way that emissions of radioactive substances to the environment are minimised.	SCCORS	Noted. If recycling is carried out, analysis has shown that any increase in radioactive emissions would be tiny.
NDA should be encouraged to continue to explore whether the discharges from Sellafield can be reduced further.	SCCORS	Noted. Environmental discharges at Sellafield are routinely kept to an absolute minimum, and are constantly under review and regulation.
If the decision is made to transport exotic fuels to Sellafield, does the Dounreay site continue with its present level of funding, given that the hazard begins to reduce?	Dounreay Stakeholder Group	The short term funding plan for Dounreay does not need to be reduced. There will be some extra short term investment at Dounreay to facilitate such moves, if the strategy is approved.
The Council believes that this engagement exercise, like the breeder fuel exercise, seems driven by trying to reduce the costs of providing security at Dounreay.	Shetland Islands Council	As stated in the NDA paper, the credible options are assessed on a variety of criteria, including safety, environmental impact, security and cost. Therefore security costs are a factor, and a key component of the economic savings, but are not the only criteria under assessment.
It is hard to understand the NDA's logic of moving this material, apparently to reduce security costs, when it is upgrading security at Dounreay at considerable cost and is currently recruiting new security staff for the site.	Dounreay Stakeholder Group; Shetland Islands Council	The current security upgrade at Dounreay is part of an industry-wide process of continuous improvement. The potential security savings described in the credible options paper would arise following completion of the proposed transport programme, and would therefore only start to impact from around 2022.
There is also no consideration of environmental issues. It is disappointing that the former practice of Best Practical Environmental Option studies appears to have been	Shetland Islands Council	Environmental issues have been considered under the 'environmental' section of the value framework analysis, and has been discussed with both the Environment Agency and the Scottish Environment Protection Agency (SEPA), the environmental regulators in

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abandoned.		England and Scotland. The requirement, and associated practice, for BPEO has not been abandoned and the means of achieving a strategic intent will be subject to the same application of BPEO as has always been the case.
The Council believes stakeholders need a proper environmental assessment of the two Dounreay and Sellafield options.	Shetland Islands Council	Noted. Environmental issues have been discussed with both the Environment Agency and the Scottish Environment Protection Agency (SEPA).
You talk about saving “millions on pounds” in the document, but no figures are given. Can you please give more details?	Shetland Islands Council; Individuals #4 and #5	The exact figure would depend on the detailed implementation plans, cost of potential reutilisation of existing facilities at Dounreay, and the mode of off-site transport. The figure, as stated in the Credible Options paper, would be in the region of hundreds of millions of pounds.

<b>Transportation of Materials</b>		
NDA should commit to ongoing engagement will all relevant local authorities in relation to emergency planning for transport incidents which could arise if the option of transporting the exotics to Sellafield for management was chosen.	SCCORS	Noted. As with all nuclear management issues the NDA continues to play an active role in working with those directly responsible for the development and implementation of on and off-site emergency plans.
Whilst not advocating transport by sea, it is noted from section 4 that this option appears to be excluded only for irradiated fuels on security grounds, and wonders why such an apparently less secure	SCCORS	Discussions are ongoing with the regulators and security advisors on available transport solutions, consistent with previous transports of similar material.  Any transport would be carried out in line with internationally agreed safety regulations and

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<p>transportation method would be suitable in that case for unirradiated material?</p>		<p>security standards. There is a lot of experience in the UK in safely transporting nuclear materials by sea, rail and road over a number of decades.</p>
<p>It appears likely that the 30-60 or so transports from Dounreay to Sellafield would need to be accompanied by armed police for security reasons. Added to the 50 rail journeys to transport breeder fuel to Sellafield this is going to mean constant armed shipments between now and 2020 travelling the length of Scotland.</p>	<p>NFLA</p>	<p>Noted, however NDA cannot discuss the detailed security arrangements for the transfer of DFR Breeder, spent fuels and nuclear materials from Dounreay to Sellafield.</p>
<p>Is the current assumption that the exotic fuels will be transported in a different manner from DFR breeder fuel?</p>	<p>Dounreay Stakeholder Group</p>	<p>The transport system for Dounreay exotic fuels, should the strategy be approved, is still under consideration. NDA and DSRL are seeking advice from the security and safety Regulators in this matter. The primary responsibility for ensuring transport safety, should the strategy change be approved, would lie with the consignor of the material.</p>
<p>How can you be sure that transportation of these materials is safe? What safety measures will be in place?</p>	<p>Individuals #4 and #5</p>	<p>The transport of nuclear material is a tried and tested, safe method which has been in place over a number of decades. All movements will be in compliance with UK safety and security regulations.</p>
<p>The safest way to deal with these materials is to keep them safely stored on the site where they were produced – why put the lives of hundreds of thousands of people along the route and within at least a 100 mile radius at risk?</p>	<p>Individual #4</p>	<p>Noted. The transport of nuclear material is a tried and tested, safe method which has been in place over a number of decades. All movements will be in compliance with UK safety and security regulations.</p>
<p>In the Executive Summary it states that the journeys would start around 2014/15 and yet</p>	<p>Individual #4</p>	<p>The DRSL Exotics credible options paper focuses on the exotic materials currently stored on the Dounreay site, excluding the DFR</p>

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<p>other reports have said that they will start in summer 2012 – which is correct?</p>		<p>Breeder material which has been dealt with separately.</p> <p>If the exotic material at Dounreay was to be transported to Sellafield, it is proposed that these movements would commence in 2014/15, as outlined in the credible options paper. These movements would include those materials described in the credible options paper.</p> <p>The movements of the DFR Breeder material will commence in Summer 2012, and are being managed under a separate programme of work.</p>
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<p><b>Engagement with Regulators</b></p>		
<p>What discussions have been held with the ONR and will reports of the discussions be made public?</p>	<p>Individual #4</p>	<p>The discussions held with between NDA, Dounreay Site Restoration Limited, Sellafield Limited and ONR are generally classified as “RESTRICTED” due to the security sensitive nature of the materials, and therefore are not publishable on security grounds. Information classified as “NOT PROTECTIVELY MARKED” could be made public in the future, subject to regulatory approval.</p>

<p><b>Irradiated Fuels</b></p>		
<p>Reprocessing irradiated fuels would breach at least two environmental principles – the proximity principal and the concentrate and contain principle.</p>	<p>NFLA</p>	<p>Noted - a decision on the future reprocessing of irradiated fuels has not yet been taken, and environmental factors will be a significant criteria in future decision making. There are several environmental principles that reprocessing supports as well, and these need to be fully considered and not taken in isolation.</p> <p>The proximity principle is discussed in the</p>

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		<p>DEFRA<sup>1</sup> document and states that “although the desire to avoid excessive transportation of materials is an important consideration, it must be balanced with all the other relevant factors on a case-by-case basis”.</p> <p>The Government’s Discharge Strategy<sup>2</sup> states that, with regards to the concentrate and contain principle, “the preferred use of concentrate and contain in the management of radioactive waste over dilute and disperse in cases where there would be a definite benefit in reducing environmental pollution, provided that BAT (BPM/BPEO in Scotland and Northern Ireland) is being applied and worker dose is taken into account (section 3.3).”</p> <p>In relation to both principles, the key point is that other factors are taken into consideration, including BAT and worker dose, for example, accelerated clean up at Dounreay and security benefits.</p>
<p>The first four options lack clarity with regard to the end point for irradiated fuel – and only option 1 identifies “eventual disposal” as an end point, but does not say where this would take place.</p>	<p>Individual #3</p>	<p>Noted.</p>
<p>It is surprising that Option 1 is credible when Option 3 is rejected as there does not seem to be much to differentiate the options. Both fail to realise “security savings”, both have new-build costs and both fail to reduce the Dounreay site hazard profile.</p>	<p>Individual #3</p>	<p>We assume you are referring to the options for irradiated fuels.</p> <p>Option 3 is rejected because use of a novel technology in the UK (spent fuel casks), which adds extra expense. Also, the current strategic expectation is that transfer of spent fuel away from Dounreay would eventually follow in later years. Due to the size of these casks, there are no guarantees that such structures could be moved between sites.</p>
<p>Both of the identified credible options will eventually require the transport of irradiated fuel</p>	<p>Individual #3</p>	<p>Noted.</p>

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from Dounreay and to do this sooner rather than later is desirable as it saves money on security and new build costs.		
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<b>Other Concerns</b>		
The THORP reprocessing plant is scheduled to close in 2018 as part of the UK's strategy to meet its OSPAR commitments. Reprocessing this exotic material would run counter to the UK Government's commitments.	NFLA	THORP is scheduled to close by 2018 when it completes the existing reprocessing contracts. While we do not believe it is credible to reprocess the DSRL PFR fuel in THORP, such fuel has been reprocessed in the past and technically they could be reprocessed in the future.
With the demise of the Sellafield MoX plant it is high time that spent fuel and plutonium are classified as waste.	NFLA	Noted. As the owner of the spent fuel and plutonium, NDA does not believe they should be classified as waste.


**References**

1: <http://www.defra.gov.uk/publications/files/pb13632-ep-guidance-rsr-110909.pdf>

2: [http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Nuclear/radioactivity/1\\_20090722135916\\_e\\_@@\\_dischargesstrategy.pdf](http://www.decc.gov.uk/assets/decc/What%20we%20do/UK%20energy%20supply/Energy%20mix/Nuclear/radioactivity/1_20090722135916_e_@@_dischargesstrategy.pdf)

**Comments received from:**

- Copeland Borough Council
- Shetland Islands Council
- Orkney Islands Council
- Cumbria County Council
- Nuclear Free Local Authorities (NFLA)
- Dounreay Stakeholder Group (DSG)



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- Highlands Council
- Scottish Councils Committee on Radioactive Substances (SCCORS)
- Individual #1
- Individual #2
- Individual #3
- Individual #4
- Individual #5