

Keswick Reminder letter 10 January 2013

Dear Editor

Response from the two Professors to Alan Tyson

We have to reply to the letter from former Allerdale Councillor and former Cockermouth mayor Alan Tyson (21 December). The author has undoubted experience and expertise as a Borough Councillor and town Mayor and has attended several MRWS meetings. We welcome this opportunity to correct any factual inaccuracies and false impressions Dr Tyson has derived from the lectures presented by Professors Smythe and Haszeldine. The tone of Dr Tyson's letter is unduly personal and emotive, and it is unfortunate that he appears to have misunderstood what was said in some cases, and failed to fact-check his assertions in many other statements.

All our lectures are focused on the long-term geological disposal of radioactive waste and not, as Dr Tyson implies, on his own expertise of waste characterisation and packaging. We explicitly do not take a position against Sellafield, nor a position against nuclear power. However, we point out that conflating the continuation of expertise and high-quality jobs on the surface has nothing to do with the location and evaluation of a high-performance long term waste disposal site beneath the surface.

We made no claim of oxygen rich groundwater dissolving uranium in 100 years, although a topic not covered in our lectures is the sound evidence from Nirex research that oxygenated water does flush to several kilometres of depth during the melting of glaciations, which will very probably release radioactivity – but in the 100,000 year future. However, there is strong evidence from the occurrence of natural minerals, and the direct measurement of groundwater, that the ancient and present groundwaters are much too oxidizing to provide secure retention of uncombined uranium. In contrast, internationally, all other potential radwaste repositories have unambiguously identified chemically reducing (low effective oxygen) groundwater.

The generation of carbon 14 radioactive gas within tens of years from sealed disposal is consistently predicted by many decades of past work from the nuclear waste disposal industry, not by us. Others have also calculated that these radioactive gases can

return to the surface above a GDF within a century and will exceed the limits set by UK legislation.

The temperature of high level waste and spent fuel is a new problem for the UK to consider, as this type of waste has not previously been requested for disposal, and, according to the NDA inventory, contains in excess of 93% of the radioactivity. It is therefore not surprising that this emplaced heat will have a big effect. Our initial research findings show that the artificially emplaced heat will accelerate the existing flow pathways of groundwater. That means that our 1999 findings of 15,000 years for water from the GDF wastes to return to the surface (which in itself is a result which contributed to the inadequate performance of the Nirex repository proposal), have to be updated. Water circulation becomes a timescale of just a few hundred years once heat is added. The age of the original water is not relevant in this circumstance. We have to ask "how long does the water take to get out from the radioactive waste?" rather than "how long did the water take to get in?" Dr Tyson has fundamentally failed to understand that the problem is to make secure predictions into the future, including combinations of low probability circumstances. The average groundwater flow rate is interesting, but much less relevant than the maximum rate of flow.

Dr Tyson correctly asserts that one of us (Haszeldine) has international standing in carbon capture and storage, but wrongly called him the lead geologist – further fact checking would have revealed that Professor Haszeldine is employed by the University of Edinburgh, and not by Scottish Power, nor any industrial consortium. Therefore he cannot be tarnished with the blame for failure of the UK's first CCS competition. Although Dr Tyson is unconvinced that someone is able to work in more than one research area, fact checking on public websites would also inform him that Professor Haszeldine has worked on deep groundwater since the early 1980's, has researched and taught undergraduate students on radioactive waste since the early 1990's, and that this work was included in the nomination for his award of the Saltire Society and Royal Society of Edinburgh

Scottish Science Prize in 1999. Further checking would reveal about eight easily discovered peer-reviewed publications on radioactive waste disposal, including an invited presentation to the Geological Society of London in 2008, and a commissioned review of the NDA research programme for MRWS in 2010.

On the possibility of future types of nuclear reactor, especially the Super-PRISM sodium-cooled offer from GE, the intention clearly stated in lectures is to illustrate that rival technical propositions exist which can use nuclear power technology to reduce the problems of some radioactive wastes. This reactor can, in principle, convert the UK plutonium stockpile into non-weapons grade and can subsequently be configured to burn all the plutonium, providing many decades of low carbon power. This does not use MOX fuel as presently conceived for the conventional EPR reactors built by EDF, so a decision on an improved version of a MOX plant in Cumbria would be seriously premature. A west Cumbria focus on MOX fabrication, and proposing west Cumbria as a UK-leading location for new-build nuclear power plant is, in our view, certainly not linked to the decisions on a GDF.

Whilst on the topic of linkages - for the avoidance of doubt we have not been funded by, nor are members of, Greenpeace, Friends of the Earth, Frack-off, National Trust, RSPB, or other campaigning organisations. And to avoid further doubt, our attendance to present lectures has not been fee-paid in any way, although travel and accommodation expenses have been partly met by local individuals and groups.

Dr Tyson comments on the location of a Repository (or GDF), mentioning Gosforth, Silloth and Ennerdale. As far as we are aware, the position of DECC (which has responsibility for identifying a GDF site, not NDA), is that no specific site has been chosen. However, during the MRWS process, there has been specific mention of GDF possibilities in each of those regions - which is why we have attempted to highlight some of the geological and construction issues - which the open and participative dialogue of MRWS was supposed to do, but has not.

It is now more widely known amongst the public:

- that there is a very substantial body of geological knowledge about west Cumbria

which was not adequately represented by MRWS,

- that a GDF investigation will entail additional surface seismic reflection and other geophysical investigations as well as multiple deep boreholes, and

- that an eventual construction project will be one the UK's largest civil engineering projects with surface impacts such as transport, imported workforce and waste spoil disposal needing mitigation regionally across Cumbria.

Dr Tyson mistakenly attributed the scenarios portrayed for Ennerdale investigations to Professor Haszeldine; these comments and constructions are the result of work by Professor Smythe. It is also incorrect to make the analogy with Longlands Farm investigations. We gave a careful explanation of why the survey technologies used on roads and fields cannot be deployed in steep trackless terrain. Professor Smythe is a very experienced geophysicist (not a seismologist who studies earthquakes). He has an exemplary record of innovative investigations of the UK's offshore geology on behalf of UK Government, and was awarded the Lyell Fund prize of the Geological Society for the quality and innovation of those discoveries. Smythe is indeed an Emeritus Professor from the University of Glasgow, and has been involved in radioactive waste disposal since leading site-survey research on Longlands Farm for UK Nirex in the mid 1990's.

Dr Tyson omits to comment on the detailed and factually based analysis of the (un)suitability of Silloth and Ennerdale regions for site investigation and waste disposal presented by Professor Smythe, and also fails to comment on the doubtful legality of the prospect of developing a waste facility the size of Carlisle beneath one of the UK's premier National Parks. Borough Councillors have a statutory duty to protect the National Park, and must also be satisfied that other UK sites have first been considered and excluded on rational grounds.

On the NDA, we are sure that there are more than two staff (Tyson states that "they each have over 25 years full time experience"), and it is incorrect that Dr Dearlove was engaged as a geological consultant by NDA - we understand that his

work was undertaken on behalf of MRWS. The analysis of May 2012 opinion poll results is publicly available on our websites, and shows no clear majority amongst the public voters for proceeding with a GDF. These websites are clearly labelled as personal research in progress, and do not represent any University view. Instead, these MRWS opinion poll results are easily displayed to show how poorly informed the public have been for this major decision point in MRWS.

Dr Tyson fails to point out that MRWS has been dominated by the Decision Making Bodies – so that in at least one case the Chair of an MRWS investigation will submit a report to the Council of which they are also Chair. Normal practice in Borough Councils is to declare an interest and consider not participating in voting if the Councillor has publicly supported a proposition. However in this proposed GDF investigation the decisions are scheduled to be made by a very small subset of councillors who are very explicitly conflicted, in serving on both MRWS and GDF decision, and are not bound by the democratic wishes against proceeding expressed by the rest of the Borough or County Council, or by the local Parish Councils.

On the much-discussed “right to withdraw” of a participating community, the extent and volume of lobbying, advertising and coercion currently being employed at this very early stage by UK Government DECC and the NDA shows quite clearly how difficult the “right to withdraw” will be if Cumbria votes to continue with this ill-fated proposition. Imagine how much more difficult this will become once several tens of millions of pounds have been spent, bringing in international drillers and geophysical surveyors - since these investigations will not provide local employment.

The expertise of the Sellafield workforce is unique and valuable. There is an urgent need for nuclear decommissioning in the UK which, according to the NDA, will provide high-quality employment for the next 120 years. The future of new-build nuclear depends not on the GDF, but on the price of that low-carbon electricity, the time taken to build the reactors, and the business arrangements with which the UK government may support it. It is clear that nuclear power can be part of the UK’s future if the combination of technology, price, safety,

waste disposal and timing is correct. However rushing into a decision for west Cumbria to participate in disposal of legacy and future wastes, is very premature. This is especially so, when any benefits will fall into west Cumbria, whereas any dis-benefits may lie in the rest of Cumbria and beneath the National Park, without representation or consultation.

Better geological sites clearly exist elsewhere in the UK, and GDF investigations must include several of these, to be more sure of obtaining the secure long-term storage for the UK which the nuclear industry says it needs. That is what the Nirex inquiry inspector concluded in 1996.

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