



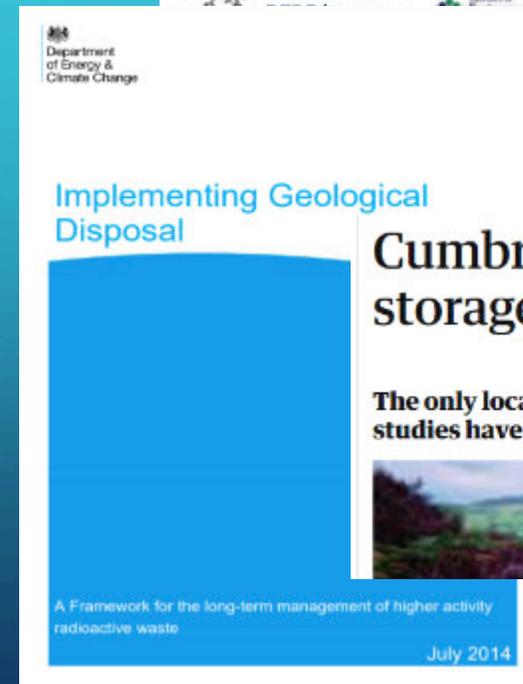
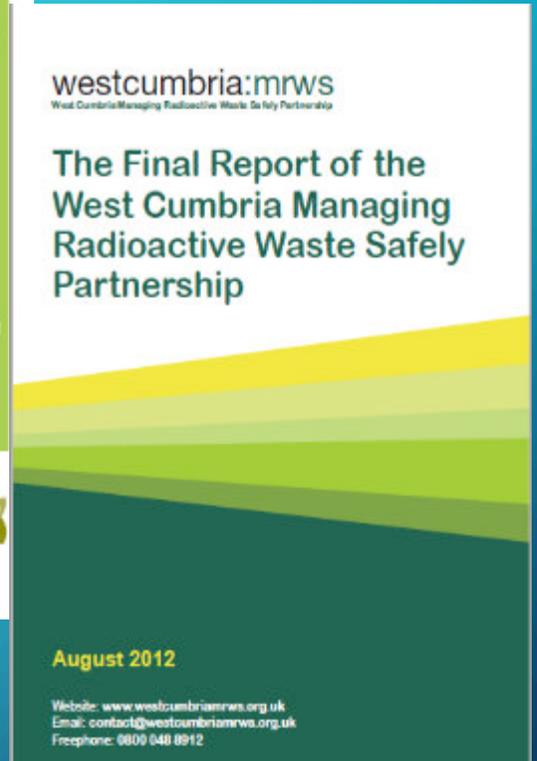
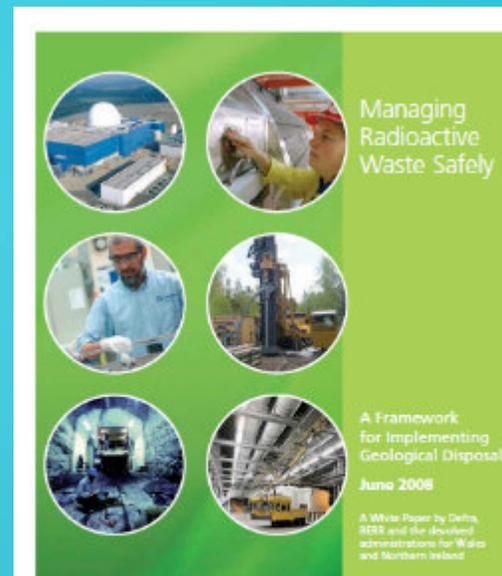
# CUMBRIA, NUCLEAR WASTE, A GEOLOGICAL 'DISPOSAL' FACILITY (GDF) UNDER THE IRISH SEA

PETE ROCHE

NFLA ALL IRELAND SUSTAINABLE ENERGY FORUM  
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# THIS IS THE 6<sup>TH</sup> ATTEMPT TO FIND A SITE FOR A GDF

- UKAEA; Billingham & Elstow; 4 near surface sites; Way Forward - Sellafield
- 5<sup>th</sup> attempt started with 2008 White Paper; ended when Cumbria CC rejected plans in Jan 2013;
- This 6<sup>th</sup> attempt - started with the July 2014 White Paper



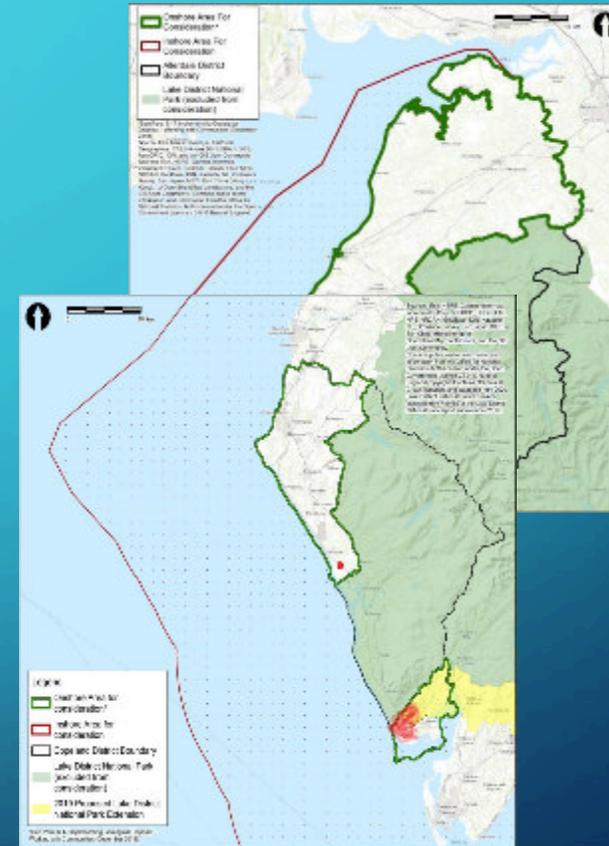
# 6<sup>TH</sup> ATTEMPT MOVES FORWARD



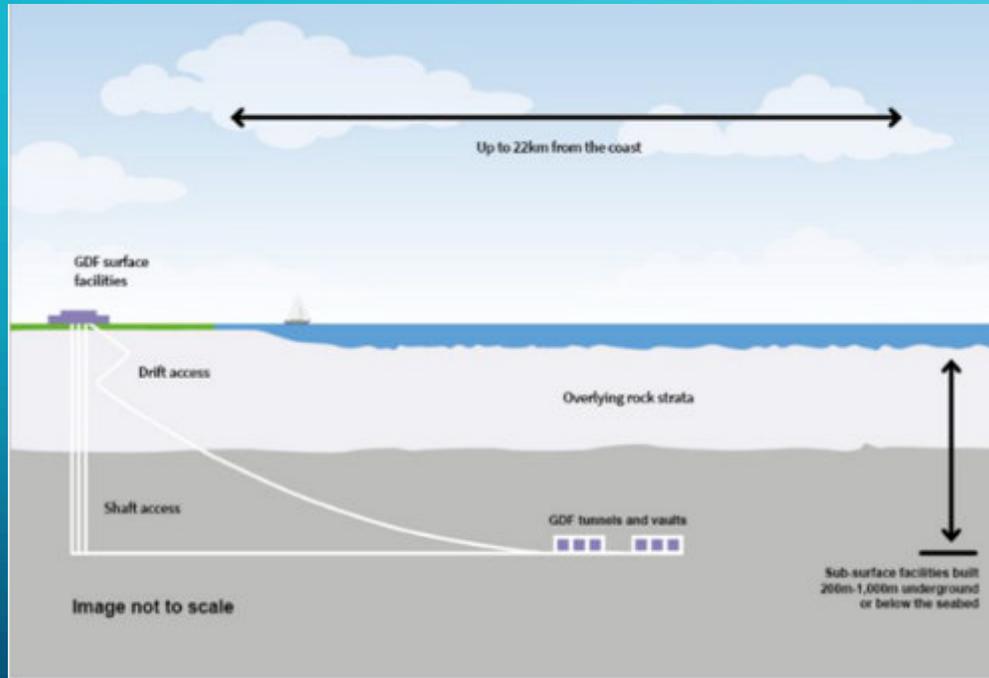
- Updated Framework Dec 2018 and NPS July 2019 kicked off a call for Local Authorities in England and Wales and other landowners to declare an interest in hosting a deep underground radioactive waste repository.

# COPELAND & ALLERDALE WORKING GROUPS

- Two Working Groups beginning discussions about the potential for hosting a GDF
- Lake District National Park excluded from search (but not the Solway Coast AONB);
- Cumbria CC lost its veto
- Substantial offshore area has been included –area up from 5km offshore to 22km

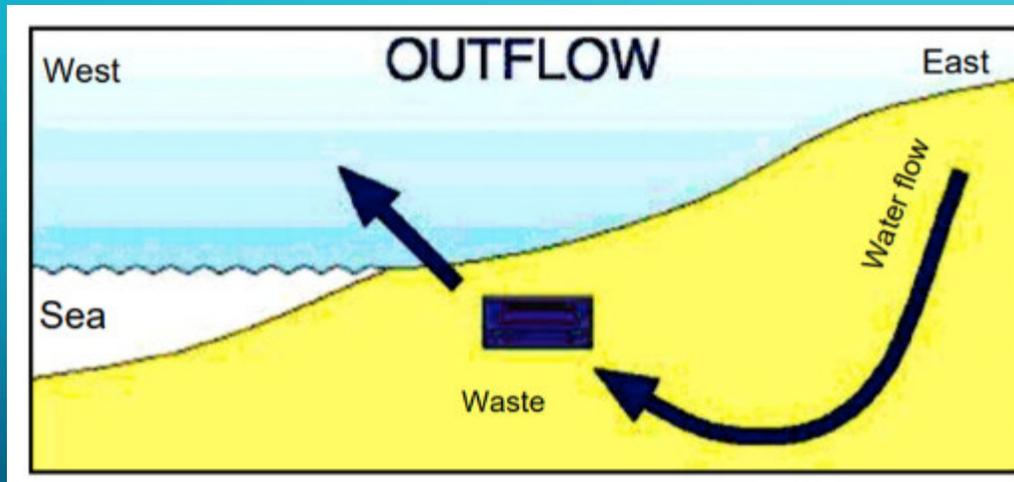


# GDF UNDER THE SEABED?



- RWM says willing to explore any areas that identified, either close to the coast or extending up to the 22km outer limit of UK territorial waters.
- RWM is in the process of examining all the previous research relating to disposal under the seabed, and has commissioned further studies

# EASTERN IRISH SEA



- Mountains drive groundwater westwards; offshore dense 'Irish Sea Brine' forces flow upwards in the vicinity of a coastal repository;
- Perhaps the thinking is that under seabed might be advantageous.
- But huge uncertainties; Centuries of coal mining left a legacy of surface collapse and instability; workings appear to be poorly mapped and a high density of faulting.

# NUCLEAR LEGACY AND FUTURE DELUGE

**Table 5** Total activities in TBq for each waste and material type at 2200. Data is shown for the 2010 Derived Inventory (2010 DI), 2010 Upper Inventory (2010 UI) and 2013 Derived Inventory (2013 DI)

Waste category	2010 DI	2010 UI	2013 DI
HLW	1,170,000	2,190,000	1,090,000
Legacy ILW	388,000	580,000	372,000
LLW	6.31	70.7	2.48
Legacy SF	1,920,000	315,000	2,270,000
DNLEU	7,910	9,510	8,370
HEU	3.10	54.4	53.8
Pu	1,280,000	1,840,000	43,700
New build ILW	-	104,000	793,000
New build SF	-	14,100,000	19,000,000
New build DNLEU	-	3,800	-
MOX SF	-	-	3,700,000
Total	4,770,000	19,100,000	27,300,000

- RWM says “...there is a pressing need to address our nuclear past, and we believe we are the generation who should take responsibility for this legacy”
- Without new nuclear 4.8m TBq
- Spent fuel from 1 EPR 3.8m TBq
- Needs to be cooled for 140yrs – so around until 2170

# LEGACY WASTE HERE UNTIL 2130 AT LEAST

- A GDF won't be available until 2040s;
- It will take around 90 years to emplace all existing waste;
- the idea that: *“The sooner we make progress, the sooner we can remove this environmental burden from our society and future generations”* is absurd.



# WEST CUMBRIA MINING

- Apart from climate issues 2 areas of concern:
- Firstly, anecdotal evidence suggests nuclear waste repository supporters see it as a useful first step to getting a GDF sited in Cumbria;
- More talk of offshore repository;

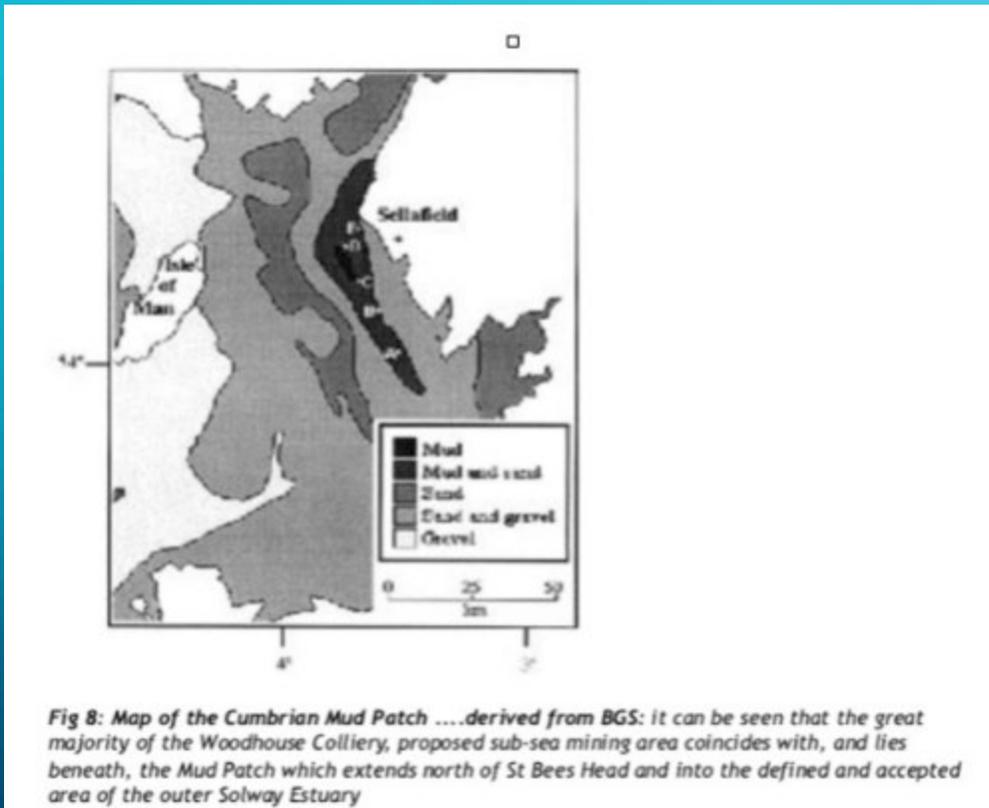


# WCM – AREAS OF CONCERN

- Mine could function like a Rock Characterisation Facility; Mine would close by 2049; GDF expected to receive waste in 2040s;
- Could even provide some access tunnels;
- Relationship between some WCM personnel or former personnel and radioactive waste bodies is worrying;
- Mark Kirkbride CEO also on CoRWM;
- Steve Reece Head of Site Evaluation at Radioactive Waste Management was previously Operations Director at West Cumbria Mining until June 2018;



# WCM - AREAS OF CONCERN



- Secondly, danger of provoking the re-suspension of heavily radioactively contaminated sea-bed sediments of the Cumbrian Mud Patch and surrounding sea-bed areas.

# PLUTONIUM RE-SUSPENSION

- Possibility of sea-bed subsidence
- Which could cause the re-suspension of sediments
- elevated doses of anthropogenic radioactivity to coastal zone populations and sea users



# PLUTONIUM RE-MOBILISED

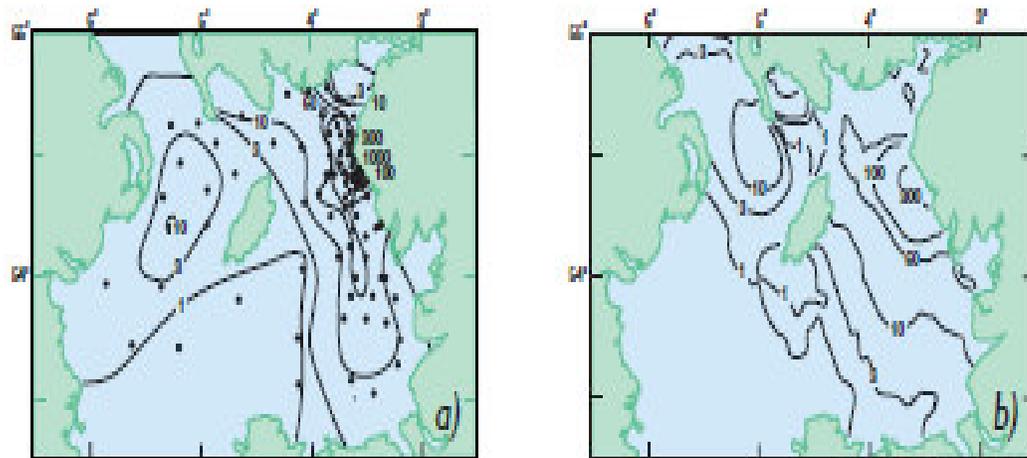


Figure 4. Total seabed inventory of  $^{239+240}\text{Pu}$  for 1995 ( $\text{Bq m}^{-2}$ ). a) Observed, b) Modelled.

- “once mobilised, the radionuclides can be transported elsewhere in the Irish Sea ...”
- Sellafield discharges may be much reduced but “the Mudpatch may continue to supply “historic” Sellafield-derived radionuclides to other locations.”
- “Indeed, recent data from Welsh and Scottish coastal areas suggest that the Mudpatch. still acts as a source of radionuclides to UK coastal areas.”

# CLOSING REMARKS

- RWM says other landowners and Councils outside of Cumbria are in active negotiation with them, but current focus on West Cumbria again;
- Radwaste problems bad enough – exacerbated by new reactors;
- Spent fuel from Hinkley Point C alone will contain about 80% of the radioactivity contained in waste that exists today – may still need cooling until 2170;
- GDF going off shore likely to make retrieval more difficult; introduce new uncertainties; remobilise contaminated sediments; perhaps even lead to further contamination of Irish Sea.