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NEWS BRIEFING: January 29th 2014
**Extreme winter weather likely to generate a major increase of
radioactivity doses of some coastal populations**

This winter's extreme weather will have had a major influence on the behaviour and fate of the radioactive wastes discharged to sea from UK nuclear sites.

Radioactive material discharged to UK coastal waters from nuclear power stations, nuclear fuel factories and re-processors, military sites and industrial sites will have been re-mobilised, made available for re-transport through the marine environment and transferred across surf lines to contaminate coastal zone environments. As a result, UK island, peninsular and coastal zone terrestrial populations will have been exposed to additional doses of radioactivity.

In the absence of any official monitoring or study of the mechanisms or magnitude of this phenomenon the doses received by those populations will remain un-quantified and the facts of the case un-recorded.

However, there is good reason to suspect that, in some cases, those doses will be of some significance to the health and well being of island, peninsular and coastal zone populations.

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NOTES:

1: Unusually heavy rainfall has generated major terrestrial flooding in most regions of the UK and vastly increased the drainage of freshwater courses into UK sediment rich coastal waters and estuaries like those of the Parret Estuary and Bridgwater Bay adjacent to the Hinkley Point nuclear site on the Somerset coast, or the Blackwater and other estuaries of the Suffolk and Essex coast adjacent to (or downstream of) the Sizewell and Bradwell nuclear sites.

There is a wide and robust scientific consensus that, in such fine sediment estuaries and muddy coastal environments, sea discharged radioactivity re-concentrates in fine sediment deposits as a result of its association with organic material and fine particles and saltwater-freshwater interactions.

Flood derived freshwater incursions decrease the salinity and re-mobilise radio nuclides such as plutonium allowing them to re-attach to fine suspended fluvial organic particles and re-mobilise through both the estuarine system and the regional coastal environment. Once re-mobilised in this way, such radioactivity is available for delivery to the coastal zone terrestrial environment via a number of pathways.

2: Heavy winds and storm surges generate extreme wave action, which has a major turbulent impact on shallow water seabed and estuarine sediments. Such turbulence re-mobilises previously "settled", deposited radioactively contaminated sediments and makes them available for transport throughout the UK coastal environment.

3: Coastal flooding/inundation due to a combination of unusually high tides, storm surges and extreme winds has occurred along large sections of the UK coast. Although the authorities appear to have made no effort to monitor the radiological consequences, an independent study demonstrated that such events may lead to significant exposures to sea discharged radioactivity.

In February 1990 extreme storm conditions breached sea defences and deposited hundreds of tonne of marine sediment into the streets, houses and coastal caravan sites of the town of Towyn on the Liverpool Bay coast of North Wales.

Out of 14 samples of this sediment analysed for radioactivity, eight contained Sellafield derived actinides (like plutonium and americium), at levels exceeding (by more than 10 times) the official concentrations at which further investigation was required.

This event almost certainly led to the exposure (via skin contact, and possibly via inhalation and ingestion,) of emergency responders, clean up workers and residents of Towyn and the adjacent coastal strip

4: Elsewhere in the UK, studies by independent and official bodies have shown that “sea washed” pastures are routinely contaminated by sea discharged radioactive wastes following inundation events, and that this has led to the radioactive contamination of the human food chain via lamb, mutton and beef raised on such pastures after inundation.

The very extensive inundations which have occurred this winter will have added additional contamination to such pastures which are regularly inundated and will have added “first time” contamination to such sites not previously inundated.

5: Strong onshore winds have been shown to be responsible for the sea to land transfer of sea discharged radioactive wastes to land.

The available evidence suggests that, the stronger the winds, the greater the magnitude of the effect, and that sea spray, marine aerosols and fine sediment particles entrained in the spray and aerosol are responsible for transporting the radioactivity across the surf line.

Robust evidence from independent UK studies (non government, non industry, non regulator) has demonstrated conclusively that sea to land transfer can make relatively significant contributions to ingestion doses acquired from the consumption of terrestrial foodstuffs contaminated by marine radioactivity.

These studies have shown that populations living up to 200 kms (by coastline) distant from point sources of radioactive waste discharge can receive

A: higher doses of **sea discharged** radioactivity in their locally grown terrestrial foods than those received by populations living next to nuclear sites

B: higher doses of sea discharged radioactivity via their locally grown terrestrial foods than they receive through their locally acquired seafoods (fish, marine algae etc).

These studies have shown that such sea discharged radioactivity can be found at least 10 miles inland as a result of transfer across the shoreline in strong sea winds.

6: Conclusion:

Weather and sea conditions, proved to force the sea to land transfer of sea discharged radioactive wastes, have occurred on all UK coast lines during the winter of 2013/2014.

Due to the paucity and ineptness of nuclear industry, and government agency research, the magnitude of the impact of this winter's extreme conditions cannot be quantified.

However, independent research has proved conclusively that sea to land transfer does occur and that marine radioactivity can have a significant impact on terrestrial food diets as a result of sea to land transfer mechanisms.

Since it is shown that the sea to land transfer of radioactivity can have such a detectable impact on terrestrial foodstuffs up to 10 miles inland and up to 200kms distant from the point source of discharge, it must be highly likely that the mechanism is also leading to doses by inhalation and skin contact.

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over 30 years experience as a freelance marine pollution consultant for campaigning Green Groups, Citizens Groups and NGOs in UK, Ireland, Europe, the USA and Australasia and has represented the Nuclear Free Local Authorities of UK and Northern Ireland, Greenpeace International, Greenpeace Australia and others on marine radioactivity issues since the 1980s