

P-05-1003 Demand an EIA now on the dumping of radioactively contaminated mud in Welsh waters, Correspondence – Petitioner to Committee, 24.11.20

In the debate the general (though not uniform) tenor of MSs' comments was about reassuring the public. The subtext is "we'll reassure them that everything's ok and their concerns are groundless". The EIA is required for complying with regulations and considering alternatives.

The Environment (Wales) Act has high-level requirements about consultation in light of uncertainties.

Our main interest is in;

- 1) the huge uncertainty over whether the average official radiation risk model takes adequate account of inhalable alpha-emitting particles,
- 2) the certainty that such particles are in the mud but are not detectable by the tests CEFAS proposes to use,
- 3) the official silence that surrounds both of those issues.

We ask that the committee acknowledge that there are serious science-backed concerns about nuclear microparticles - requires proper tests for the alpha emissions on the mm-scale, on top of the planned gamma and alpha spectrometry.

That there are serious science-backed concerns about the radiation risk models, especially in regard to internal alpha and beta emitters, NRW needs to consider both the ICRP and ECRR models, not confine their assessment to the IAEA dose model for gamma radiation.

NRW should have considered radon-type alpha detectors, not accepted CEFAS's dismissal of these long-used techniques. NRW rejects the use of CR39 arguing that it can't tell the difference between plutonium and uranium. This is irrelevant and misleading for three reasons:

- 1) 0.1micron diameter particles of Plutonium-239 oxide give the same frequency of alpha tracks as Uranium oxide particles 100 times bigger.
- 2) hotter particles are more likely to kill cells than less radioactive ones. Cell killing doesn't cause mutation; cells with survivable genetic damage can pass mutations to an increasing number of cells so, contrary to conventional dogma, dose is NOT everything and
- 3) the testing techniques used by CEFAS cannot detect particles of alpha emitting oxides at all.

The decision by NRW that the mud dredging and dumping project is an amendment to the Hinkley Power Station development means the full range of alternatives has to be considered.

They are not simply the first proposed dumping outside the Severn "Marine Protection Area" and using the dredgings on EDF's building site, but also using land-based cooling towers instead of the whole seawater extraction plan and its fish/wildlife harm.

Obvious concerns include;

- Impacts on Welsh beaches and people,
- No monitoring of impacts of the 2018 dumping,
- Test for nuclear tracers like americium-241, and that requirement on baseline and post-dumping monitoring be included this time.
- The unsatisfactory outcome of the Titan dumping study (NRW denial that the mounds could be linked to Hinkley)
- Contradiction between CEFAS modelling of the dispersing mud (upstream they say) with the Severn SMP (anti-clockwise circulation - takes the mud to Barry Island)
- the EIA needs to cover/summarise the Fish-kill evidence to the Planning Inquiry, including the breach in the Habitats-Species law.

Another complicated issue that calls for a second Appendix is baseline monitoring in Wales and modelling of the fate of dumped mud.

We ask that the Petitions Cttee consider sending these "scoping" propositions to NRW and the Davidson group and ask for responses?

In order to be of assistance to the Committee, we could write a self-contained paper that they could readily pass on to NRW from the 1 Dec. meeting.

Thanks in advance,

Appendix to Petitions Committee GeigerBay campaign 25 Nov 2020

EDF submitted an EIA Screening request to NRW on 16 August. Both their request and NRW's letter consulting selected consultees on the request omit to mention the special status (since 2018) of Marine Protection Area, with presumption against avoidable industrial activities in it. If the MPA had applied in 2012, the English decisions may have been different, in particular that where the sea-waters are 'sensitive', the EA policy is to build land-based cooling systems for nuclear power plants.

NRW's letter to the chair of 3rd August stated that several items in the Geiger Bay petition are "beyond the scope" or "out-of-scope" of the EIA Regulations and the marine licensing regime. The same error was made in the 2013 and 2018 licensing decisions.

- Sched.3 of the EIA Regs (as amended 2017) requires a description of the "physical characteristics of the whole project" and location of the project within the MPA both on the English side and the Welsh side's dump-site. NRW accepted EDF's application with no description of the whole project
- the EIA Regs specify NRW must reach a conclusion about the likely significant effects of the project including (a) human health (b) biodiversity...;(c) land, soil... ; (d) material assets, cultural heritage.

The EIA Regulations are very wide in scope. NRW tends to rely on its 'expert' opinion to judge "not likely" and "not significant", but case-law has established that quite detailed procedures must be followed to 'reach a conclusion'. Deciding from a position of ignorance that dumped sediments are unlikely to be significant is not permitted; detailed knowledge of contaminants and their human hazards, and modelling the pathways and end-points of the mud are needed, backed up by available studies.

The Petitions Committee report in 2018 summarised the radio-nuclide problem:

The sediments to be dredged adjacent to the waste pipes used for the discharges over 50+ years from Hinkley's reactors are contaminated by radioactive waste discharges.

Studies prove that sedimentary radioactive material does not simply disperse, but re-concentrates in coastal and estuarine mudflats and saltmarshes, and is also available for sea-to-land transfer during onshore winds and coastal flooding. We note the absence of research on the fate of such radioactivity in South Wales inshore waters. In this context we are concerned that the environmental and human health (dose) risks from the proposed disposal have not been adequately researched and that any conclusions based on the current incomplete data, are unreliable.

Since the Committee's 2018 report, information has come to light on the likelihood of particulate nuclear matter being included in the sediments, whether emitted to air or through the 5-micron sized cooling pond filters. The main nuclides (after soluble ones leached out) would be plutonium and uranium, both alpha emitters. Such small "hot" particles would not be detected by spectroscopy (CEFAS's method), but by radon-type detectors that record patterns of alpha tracks.

NRW supposes safety can be decided by the IAEA minimum standards for sea disposal, which apply to gamma emissions alone, but they and their advisors CEFAS are wrong. Only the EIA requirements cover the microparticulate alpha emitters.

- NRW assumed dumping to be in an acceptable disposal site, yet the Cardiff Grounds dump has not been reviewed since the 1980s – not since the Conservation designations and not following tighter requirements in 2014 (IMO guidelines on disposal of dredgings). The *Conservation of Offshore Marine Habitats and Species Regulations 2017* required review "as soon as reasonably practicable".
- Defra in the mid-2000s decided that to satisfy the Habitats and EIA Directives for marine conservation areas (SPA, SAC etc.), full assessments would be needed for each dredging operation, unless a *dredging protocol* was in place for each port. That would need to cover the fate of ordinary dredgings, but also special contaminated capital dredgings if they were to be included. CCW began to develop a protocol for the Cardiff area port dredgings in 2011 but NRW discontinued it. Hinkley's nuclide-contaminated dredgings were never in scope. No dredging protocol was adopted for the Severn Estuary SAC (Cardiff Grounds) dump, so full compliance with the EIA and Habitats Regulations is required for each disposal license.
- the Welsh Government 10 August letter to the chair does not mention Defra's judgment that EIA is required for any disposal of dredgings in the Severn SAC. The letter says it's simply a regulatory

Summary - EIA Issues in-scope that need to be included Geiger Bay October 2020

1. The London (anti-dumping) Convention implemented in UK law forbids sea dumping unless strict and detailed assessments have been carried out. The IMO (*international Maritime Organisation*) issues updates - the latest Dredged Material Assessment Guidelines in 2014 tightens pressure to avoid sea dumping where possible. The EIA must therefore address all the issues in that guidance and in particular detail the alternative re-use or disposal routes.
2. Welsh policy in the *Public Health Wales Act* prescribes participative *Health Impact Assessment* for major projects of high public concern. EDF should have been foreseen the need for HIA from the high public concern experienced in 2018. It normally forms part of Welsh planning EIAs which have to address impacts on humans, so should be in the scope this time.
3. Baseline data on the Severn Estuary: the current Environmental Management Scheme (EMS) is very incomplete. NRW say several designated features, including the fish assemblage, are in an *unfavourable state*. This needs detailing before dumping any more Hinkley mud, as this is quite different from port dredgings. Knowledge on the fate of dumped sediments – where they land up on mudbanks and saltmarsh including in river estuaries - is essential for dumping in any Special Area of Conservation and particularly one containing European Protected Species. The EIA needs baseline data on artificial nuclide levels in the south Wales coastal environment, focussing on ones likely to be released; tests in Somerset's tidal river Parrett were revealing, but none have been done in the Welsh Rhymney, Wye and Usk.
4. Microparticles of plutonium etc. as predicted from the Hinkley nuclear discharges: radon-type detectors (tracks in CR39 plastic) are best to detect alpha-emitters in micro-particles, which are the most dangerous when inhaled into the human body. EDF's consultants CEFAS refused it and NRW omitted it from the testing spec. The EIA should provide information from the alternative testing methods, try them out on the samples, and compare results. EDF should share portions of their samples for independent testing; as was done by the Environment Agency with samples from the river Parrett, where the independent CRIIRAD testing proved superior to EDF's by CEFAS.
5. Assessment of several alpha and beta emitting radio-nuclides ignored by EDF and NRW (Sr-90, Tc-99, S-35, C-14, H-3) was recommended by the independent CRIIRAD (report 18-32, May 2018, *Radiological analysis... close to the Hinkley Point power stations*) which found radio-toxic americium (Am-241) from nuclear discharges. These alpha and beta emitters are relevant because they and not the gamma emitters are relevant for assessing harm to wildlife and humans from ingestion. Only Am-241 and H-3 of CRIIRAD's list are in NRW's testing advice, while EIA's have to be comprehensive.
6. Modelling of potential impacts on the human population, to beach users, seafood eaters and others inhaling microspray and mud particles contaminated by Hinkley nuclides. A model was developed for Cumbria by AEA Harwell, which can be adapted with local data and a local habits survey for the South Wales coast population. It includes

nuclide transfer to land, such as Hinkley microparticles carried ashore by winds. This model requires collecting much local baseline data.

7. Processes that bioconcentrate and magnify nuclear and chemical pollutants in the Estuary waters and the food chain need assessing under IMO dredged material guidelines (2014). Several chemical pollutants in the Hinkley mud exceed UK Action Level-1. The IMO in this case requires 'detailed assessment', where testing of the bio-mechanisms and biosensitivity takes months and gives uncertain results. An EIA has to use the best available science and describe uncertainties. The alternative of managing chemical and nuclide-contaminated wastes on land is normally preferred and must be assessed too.

8. Dredged material intended for disposal is subject to waste management law. The proximity and self-sufficiency principles in Wales's Waste Strategy (*Towards Zero Waste* 2010) say options for managing Hinkley wastes in England must be presented by dumping or reuse eg. in bunds on the power station site, and any reasons given against be critically assessed in the EIA (cf. 'geographical circumstances' of *Towards Zero Waste*).

9. The OSPAR treaty requires us to return nuclides in the sea to historical levels (pre-nuclear power) by the 2020s and artificial nuclides to near zero. Plutonium discharges from Hinkley ceased in 2014. The potential breach by releasing plutonium etc. buried in the mud needs addressing in the EIA.

10. The EIA has to describe the central purpose of the project, to construct a system for extracting cooling water from the estuary, returning it 10°C warmer, and the consequential effects. These include mass fish-kill, the discharge of dead and maimed fish into the Severn Estuary, discharged biocide chemicals used to clear Hinkley's pipework, and killing or harming any individuals of European protected species (EPS) of fish, as well as the critically-endangered European eel. If any EPS would be harmed, the EIA has to show there is no practicable alternative.

11. The EIA has to face the possibility that the Environment Agency might cancel the 2013 licence for water abstraction, because (as the EA say re. the recently announced public inquiry) it's not compatible with the Habitats & Species Regs. Also face the possibility that NRW will reject the dumping application. The EIA should therefore describe what alternative cooling systems they could fall back on (as in countries which ban the use of seawater that's far poorer in ecology than Bridgwater Bay).

matter “having regard to the legal requirements of the EIA Regulations” and nowhere mentions the special conservation status of the Severn. The NRW’s own letter 3 August acknowledges it’s a European marine site (SAC, SPA) in its final sentence but not its Marine Protection Area status.

- Defra and the WG had commissioned CEFAS to regularly review marine dump-sites post-2000, but when NRW took over in 2013, the reviews were discontinued. The WG rushed out a special desktop review by CEFAS “Welsh Disposal Site Review C6268U” (March 2020). This repeats that the dump site is “dispersive” (despite evidence from the 2018 dumping is of mounds of material on the seabed 6 months post-dumping (Titan Environmental report April 2019). CEFAS say the sediments move upstream towards Newport based on a model run for only 60 hours, with no mention of the contradiction with the Shoreline Management Plan that sees the material as circulating towards Barry. On the basis of CEFAS’s 60-hour modelling, deposits on Barry beaches as well as in tidal reaches of the rivers Rhymney, Usk etc. would be ignored.
- NRW wishes to apply IAEA minimal criteria for sea-dumping, even though the mud and sediments to a large extent end up in saltmarsh, riverine mud, mudflats including Barry Old Harbour and beaches, plus very uncertain amounts transferred to land.
- EIA and Habitats laws go wider than sea-dumping laws (IAEA and London Convention), not only in requiring account of bioconcentration of radionuclides but also of their transfer to land and into humans. Bioconcentration of toxic metals has been studied in the Severn bird-life; nuclides have been studied on Flatholm island, but not the systematic studies needed to meet EIA criteria.

Responding to the NRW rejection of points in the Petition

- *“Detailed baseline data on the behaviour and fate of material dumped at Cardiff Grounds”*: This is beyond the scope of the Marine Works (EIA) Regulations 2017

UNTRUE (above)

- *“Full radiological analysis including detection of alpha-emitting particles”*: not required by internationally agreed guidance

FAILS to use radon-type detection of alpha-emitting microparticles (above) to meet EIA requirements for human health protection

- *“A detailed and up-to-date assessment of potential radiological impacts on the population of south Wales”*: out of scope of Marine Works (EIA) Regulations 2017

Very much “in-scope” under EIA (above). NRW and CEFAS previously (2018) used a model of impacts on the Cumbrian population that’s quite inapplicable for the Severn Estuary sediment behaviour and the far more frequented south Wales shores.

- *“Containing nuclear pollutants on land rather than dispersing them at Sea”* safe for disposal following a thorough assessment of the evidence that supports the application.

No evidence was given (or required by IAEA) on bioconcentration in biota and the food-chain; as limited information is available, the precautionary principle says – don’t risk it.

- *“Respecting international agreements on marine dumping”*:

The London (no marine dumping) Convention requires priority to disposal on land; OSPAR requires separation of solid material for land disposal. In cases where chemical pollutants are above Action-levels (as for several) OSPAR requires detailed assessment, which was not done.

- *“Protecting the Severn Estuary”*:

NRW does not even mention the Marine Protection Area designation (in 2018) and avoiding industrial activities within it. They make no mention of the fish-slaughter in the seawater abstraction system (item 10 of Summary). They make no mention of the at-risk European eel and European Protected Species of fish (shad, lampreys) killed by the scheme, contrary to the absolute protection under Habitats law. This is part of the “project” to which EIA law applies, even if NRW argue it’s in English waters, so “indirect” effect.