

From: aceactivists@comcast.net
To: [Ennis, Rick](#)
Subject: Re: Borehole Testing
Date: Friday, April 10, 2015 3:31:34 PM

4-10-15

To: Rick Ennis, NRC

From: Dr. Lewis Cuthbert, ACE

You asked for clarification on our question about whether Exelon or NRC did borehole testing, stating the term is used in the context of a hole driven into the ground.

That is exactly what we would like addressed in regard to assessing undetected cracks and leaks from Limerick's reactors.

When there are cracks in the reactors and cracks in the concrete surrounding them, radiation can escape into the soil. From there it can contaminate groundwater.

- **Exelon's reports to NRC confirm that Limerick's sediment and broad leaf vegetation, as well as groundwater are radioactive.**
- **Weakened reactor cement could be causing the soil and groundwater closest to the reactors to be far more radioactive than the levels reported by Exelon.**
- **We believe independent borehole testing close to Limerick's reactors could indicate leaks from the reactors themselves.**

Radioactive Groundwater And Soil Contamination At Limerick Nuclear Plant Include:

LIMERICK NUCLEAR POWER PLANT - RADIONUCLIDES IN WATER
12 Radionuclides - Reported "Above Background" — ½ Life

1.	Cesium Cs-134	30 Years
2.	Cesium Cs-137	30 Years
3.	Manganese Mn-54	314 Days
4.	Zinc Zn-65	250 Days
5.	Cobalt Co-58	70 Days
6.	Cobalt Co-60	70 Days
7.	Zirconium Zr-95	65 Days
8.	Iron Fe-59	46.6 Days
9.	Niobium Nb-95	35 Days
10.	Iodine I-131	8 Days
11.	Barium Ba-140	13 Days
12.	Lanthanum La-140	40 Hours

Source: Exelon's 2007 and 2009 Radiological Reports To NRC

Note: The Hazardous Life of a Radioactive Isotope is Ten to Twenty Times its Half-Life

Reality: Synergistic, Additive, and Cumulative Harmful Impacts Are Obviously Significant

Problems: Many Radionuclides go Unreported and Unmonitored.

LIMERICK'S SEDIMENT AND BROAD LEAF VEGETATION

8 Radionuclides Reported "Above Background" $\frac{1}{2}$ Life

1.	Beryllium Be-7	53 Days - Unstable
2.	Cesium Cs-134	30 Years
3.	Cesium Cs-137	30 Years
4.	Manganese Mn-54	314 Days
5.	Cobalt Co-58	70 Days
6.	Cobalt Co-60	70 Days
7.	Iodine I-131	8 Days
8.	Potassium K-40	1 Day

The importance of Limerick's embrittlement issues is much more important now in light of NRC's notice in the Federal Register 3-13-15 that NRC is weakening the regulation for Limerick's compliance with regulations related to embrittlement.

The reason these reactor embrittlement issues are critical is because there are huge uncertainties in predicting the progression of nuclear reactor aging. Unidentified degradation of reactor vessels such as cracks and flaws have the potential to escalate an incident into an uncontrollable accident, even though it does not cause problems during normal operation.

From: "Rick Ennis" <Rick.Ennis@nrc.gov>
To: "Alliance for a Clean Environment (ACE) (aceactivists@comcast.net)" <aceactivists@comcast.net>
Cc: "Fred Bower" <Fred.Bower@nrc.gov>, "Doug Broaddus" <Doug.Broaddus@nrc.gov>, "Scott Rutenkroger" <Scott.Rutenkroger@nrc.gov>, "Matthew Fannon" <Matthew.Fannon@nrc.gov>, "Scott Barber" <Scott.Barber@nrc.gov>
Sent: Wednesday, April 8, 2015 8:31:21 AM
Subject: Borehole Testing

Dr. Cuthbert,

The NRC is preparing a response to your 3/16/15 email to Fred Bower, "Request for Reactor Cracking "Material Fatigue" Testing of Both Limerick Nuclear Plant Reactors." The NRC staff requests clarification from you on one issue to assist in providing the response. Specifically, your letter asks about whether "borehole testing" has been performed for the Limerick reactors. It is not clear to me what is meant by the term "borehole testing" with respect to nuclear reactor vessels. This term is typically used in the context of a hole driven into the ground to obtain geological information.

Any further information or clarification/reference of what is meant by this term would be appreciated.

Thanks,

Rick Ennis
NRC Project Manager for Limerick and Peach Bottom