

What Does That Number Mean?

Supplemental Information for Ecology's Water Quality Policy Forum

February 8, 2013

Risk level terminology that you will hear...

	Numeric	How to say it...	What it means, under specified exposure assumptions	What are the exposure assumptions that are included in Washington's current human health-based criteria (the 1992 National Toxics Rule criteria)?
 Increasing protection	10^{-6}	Ten-to- the-minus-sixth	...risk of one additional occurrence of cancer, in one million people...	70 years of daily exposure to 6.5 g/day of fish and shellfish, and 2 liters/day of untreated surface waters, by a 154 lb. person.
	10^{-5}	Ten-to- the-minus-fifth	...risk of one additional occurrence of cancer, in one hundred thousand people...	
	10^{-4}	Ten-to- the-minus-fourth	...risk of one additional occurrence of cancer, in ten thousand people...	

At different fish consumption rates, how many pounds would I eat?

Below is a chart showing how specific amounts of fish/shellfish translate from grams per day to approximate pounds per day/week/month/year.

grams/day	pounds/day	pounds/week (7 days)	pounds/month (30 days)	pounds/year (365 days)
6.5	0.01	0.10	0.43	5.23
65	0.14	1.00	4.30	52.30
650	1.43	10.03	42.99	523.05

Units of Measure

- **Picogram (pg)** - The picogram is equal to one trillionth of a gram (10⁻¹²g)
- **Nanogram (ng)** - The nanogram is equal to one billionth of a gram (10⁻⁹g)
- **Microgram (µg)** - The microgram is equal to one millionth of a gram (10⁻⁶g)

Concentration analogies: What is one-part-per...?

One-Part-Per-Million

- one minute in two years
- one drop of food dye in 16 gallons of water

One-Part-Per-Trillion

- one drop of detergent in enough dishwater to fill a string of railroad tank cars ten miles long
- one square inch in 250 square miles

One-Part-Per-Billion

- one kernel of corn in a 45-foot high, 16-foot diameter silo
- one second of time in 32 years

One Part Per Quadrillion

- one postage stamp on a letter the size of California and Oregon
- one human hair out of all the hair on all the heads of all the people in the world

(Source for concentration analogies: <http://www.nesc.wvu.edu/ndwc/articles/OT/FA04/Q&A.pdf> and <http://waterontheweb.org/resources/conversiontables.html>)