TABLE TO CONVERT GEIGER COUNTER READINGS TO CPM TO ANNUAL OR LIFETIME EXPOSURE LEVELS - Shaikh Jalal Ahmad

Conversions:		Units	Meter reading (take average of at least 3 minutes of counts)							
cpm to mR/hr	divide cpm by 1500 to get mR/hr	cpm	10	**20**	30	60	**100**	150	200	300
cpm to µSv/hr	divide cpm by 150 to get µSv/hr	cps	0.17	0.33	0.5	1	1.67	2.5	3.3	5
cpm to mR (yearly)	multiply cpm by 8760/1500 (5.84)	mR/hr	0.01	0.01	0.02	0.04	0.07	0.1	0.13	0.2
cpm to µSv (yearly)	multiply cpm by 8760/150 (58.4)	mR/year	58.4	116.8	175.2	350.4	584	876	1168	1752
cpm to µSv (yearly)	multiply cpm by 8760/150 (58.4)	µSv/hr	0.07	0.13	0.2	0.4	0.67	1	1.33	2
		µSv/year	584	1168	1752	3504	5840	8760	11680	17520

Dosage rates, total doses and exposure guidelines (8760 minutes in one year, 60 cpm = 0.038 mR/hr = 0.38 µS/hr)

7	cpm	0.005 mR/hr	0.05 µSv/hr	0.4 mSv	400 µSv	Yearly dose per person from food per year
18	cpm	0.011 mR/hr	0.11 µSv/hr	1 mSv	1000 µSv	Total Dose EPA yearly limit for radiation exposure to general public (300 cigarettes @ 3.3 uSv each)
36	cpm	**0.023 mR/hr**	**0.23 µSv/hr**	**2 mSv**	**2000 µSv/yea**	**Natural background radiation (varies with location and altitude)**
61	cpm	**0.039 mR/hr**	**0.39 µSv/hr**	**3.4 mSv**	**3400** µSv	**TOTAL EXPECTED+ALLOWED EXPOSURE TO GENERAL PUBLIC IN ONE YEAR (incl. food)**
108	cpm	0.07 mR	0.68 µSv/hr	6 mSv	6000 µSv	Total Dose, 1 hour at the grounds of Chernobyl in 2010; double the expected US radiation dose or 2 mammograms
54	cpm	0.03 mR	0.34 µSv/hr	3 mSv	3000 µSv/yr	**Approx Dose rate measured by Dutchinse in Kansa, May 2011 - this is just under double normal background**
54	cpm	0.03 mR	0.34 µSv/hr	3 mSv	3000 µSv	Mammogram
65	cpm	0.04 mR	0.41 µSv/hr	3.6 mSv	3600 µSv	One day dose at two sites 50kM NW of Fukushima (however, other nearby areas saw barely elevated levels)
104	cpm	0.07 mR	0.66 µSv/hr	**5.8** mSv	**5800** µSv/yr	Dose rate measured by Dutchinse in El Dorado Park, 6/6/11
						This is like having two mammograms a year , about double the background radiation levels
						100cpm exposes you to about 1/17 th the required dose where there's a lifetime increase in cancer risk
179	cpm	0.11 mR	1.14 µSv/hr	10 mSv	10000 µSv	Average CT scan
646	cpm	0.41 mR	4.11 µSv/hr	36 mSv	36000 µSv	Smoking 1.5 packs a day for a year (20 cig / pack, 30 cig / day, 10950 cig / year, 3.28 µS / cig
897	cpm	0.57 mR	5.71 µSv/hr	50 mSv	50000 µSv/yr	Maximum yearly dose permitted for US radiation workers - this is 50x what general public is "allowed"
1795	cpm	1.14 mR	11 µSv/hr	**100** mSv	**100000** µSv/yr	**Annual dose at which increased lifetime risk of cancer is evident**
4486	cpm	2.85 mR	29 µSv/hr	250 mSv	250000 µSv	Dose limit for US radiation workers in life-saving operations
62880	cpm	40.00 mR	400 µSv/hr	3504 mSv/yr	3504000 µSv/yr	Maximum radiation levels detected at Fukushima per hour
						NOTE: radiation workers were instructed to spend no more than 15 min at a time inside the Fukushima reactors
NOTE: Radiation detected 50kM from Fukushima were about 1000x less than the maximum levels detected at the reactor						This amounts to 1/4 * 400 or 100 mSv total dose, which is the threshold where lifetime risk of cancer would occur
						Radiation workers do put their lives on the line

My initial opinions/observations/running conclusions (from reasonable but not exhaustive study on the subject):

1 I've measured the Hetch Hetchy water from my office in Redwood City. It appears to be in the range of 17-25 cpm (~0.01-0.02mR/hr) quite consistently. The background radiation (open air) is similar.

2 The problem with exposure rates like above is that there's no way to easily tell if you've ingested alpha emitters like Plutonium or Uranium
In those cases, the particles will remain in your body for a long time and can cause extensive damage, including mutations/cancer cells to form. A diet high in anti-oxidants and low in stress will help.

3 Examine the products you want to eat with your own Geiger counter/dosimeter. Lots of good resources to check out there on what foods are higher risk than others. Cows milk, for one, or cheeses.

4 Mountain run-off coming this summer and fall may have higher levels of radiation since the particles are probably 'trapped' in the snow melt.
Would suggest not bathing in mountain run-off or lakes unless you can measure the radiation levels and see how close to background they may be.

5 If you want to protect yourself from externally deposited (beta/gamma) or internal sources of radiation, I'd suggest being informed about foods / supplements that can prevent toxicity. Measure foods you're suspicious of. Most good detectors are in the $200-$500 range, the Inspector Alert or CRM-100 are good choices though with 2 month lead times.

6 ENJOY YOUR LIFE! Spend time outside, with family - connect with your deep, true self and know all is well, even if it may not always feel that way. The Universe is built on LOVE!

7 Contribute in whatever ways you can to bringing beauty into the world!