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Sea Water, Sea Life, Soil, Vegetation, and Milk Sample Results, 2011 to 2013

The California Department of Public Health (Department) has responded to numerous requests surrounding the safety of California residents from past and current incidents at the Fukushima nuclear power plants in Japan. Information from Federal agencies, State programs, as well as the Department's own sampling results, conclude there are no health and safety concerns to California residents.

The Department recently responded to reports of elevated radioactivity readings on California's beaches in the vicinity of Half Moon Bay. Preliminary data compiled by the Department indicates the elevated radioactivity is due to naturally occurring radioactive materials (NORM), not Fukushima related activities. The NORM on the beaches is not causing an impact to public health. The Department's final report on its investigation will be posted on its website within the next few weeks.

The Department performs ongoing statutorily required environmental monitoring around California's nuclear power plants to determine if plant operations are impacting the environment. Attached are laboratory and chain of custody reports for 2011, 2012, and most of 2013 for seawater, sea life, sea kelp, milk, and soils. All seawater and sea life results are below the Department laboratory minimum detectable limits. Very low levels of radioactivity were detected in milk during the Fukushima accident, which were well below any level of health concern. Low levels of radioactive Potassium-40 (K-40, NORM) were detected.

All samples are analyzed by the Department's laboratory for gamma emitting radioactive materials using high purity gamma spectroscopy. Seawater samples are also analyzed for tritium (a radioactive isotope of hydrogen). Sample reports for gamma spectroscopy only report values when the sample results exceed the minimum detectable activity. A separate report is generated for tritium analysis and an activity is calculated along with its minimum detectable activity. Sample size values are reported in units of kilograms.

Radionuclides (radioactive isotopes) and typical minimum detectable activities for various analysis methods are listed in Attachment 1, Laboratory Minimum Detectable Activities.

The Department is compiling air sampling results for the same time frame. As soon as the Department receives updated data from the laboratory, all applicable results will be posted on its website. Environmental results are collected and analyzed on a quarterly basis.

Links to government websites with current information are noted below:

<http://www.fda.gov/newsevents/publichealthfocus/ucm247403.htm#new>
<http://www.epa.gov/radnet/index.html>
<http://public.health.oregon.gov/Preparedness/Pages/04-2012JapanDebris.aspx>
<http://www.doh.wa.gov/CommunityandEnvironment/Radiation/FukushimaUpdate.aspx>
<http://www.iaea.org/newscenter/news/2013/japan-basic-policy-full.html>
<http://www.who.edu/main/topic/fukushima-radiation>

Attachment 1, Laboratory Minimum Detectable Activities

Geometry Name	0.5 L Marinelli	1.5 L Marinelli	3.5 L Marinelli	4 inch Canister	2 inch Planchet	Air Filter/Wipe	Air Composite	Carbon Cartridge
Type of Sample	Water	Water	Milk	Soil, Sediment	Biotas, Vegetation	Air Filter, Wipe	Air Filters	Carbon Cartridge
Sample Size	0.5 L	1.5 L	3.5 L	300 g	50 g	1 AF/Wipe	10,000 m3	1,000 m3
Count Time	1000 min	1000 min	1000 min					
Units	pCi/L	pCi/L	pCi/L	pCi/g dry wt	pCi/g dry wt	pCi/sample	pCi/m3	pCi/m3
Be-7	26	12	8	0.04	0.1	7	0.0006	0.007
K-40	110	53	31	0.2	0.6	34	0.003	0.05
Mn-54	4	2	1	0.006	0.02	1	0.00009	0.001
Co-57	3	1	1	0.004	0.009	1	0.00005	0.0006
Co-60	4	2	1	0.006	0.02	1	0.0001	0.001
Zn-65	7	3	2	0.01	0.03	2	0.0002	0.002
Y-88	4	2	1	0.006	0.02	1	0.0001	0.001
Nb-95	4	2	1	0.006	0.02	1	0.00009	0.001
Zr-95	6	3	2	0.009	0.02	2	0.0001	0.002
Ru-103	3	2	1	0.005	0.01	0.8	0.00007	0.0009
Ru-106	35	16	11	0.05	0.1	9	0.0008	0.01
I-125	164	43	42	0.07	0.05	3	0.0002	0.001
I-131	3	2	1	0.005	0.01	0.8	0.00007	0.0009
Cs-134	3	2	1	0.005	0.01	1	0.00008	0.001
Cs-137	4	2	1	0.006	0.02	1	0.00009	0.001
Ce-141	6	3	2	0.008	0.02	1	0.0001	0.001
Ce-144	24	12	8	0.03	0.07	5	0.0004	0.005

Geometry Name	0.5 L Marinelli	1.5 L Marinelli	3.5 L Marinelli	4 inch Canister	2 inch Planchet	Air Filter/Wipe	Air Composite	Carbon Cartridge
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Sample Size	0.5 L	1.5 L	3.5 L	300 g	50 g	1 AF/Wipe	10,000 m3	1,000 m3
Count Time	1000 min	1000 min	1000 min	1000 min				
Units	pCi/L	pCi/L	pCi/L	pCi/g dry wt	pCi/g dry wt	pCi/sample	pCi/m3	pCi/m3
Ra-224 (Pb-212)	14	7	5	0.02	0.05	3	0.0003	0.003
Ra-226 (Bi-214)	16	7	3	0.03	0.06	4	0.0003	0.005
Ra-228/Ac-228	23	12	8	0.03	0.1	7	0.0007	0.008
Th-228 (Tl-208)	21	11	6	0.03	0.09	6	0.0005	0.006
Th-232 (Ac-228)	23	12	8	0.03	0.1	7	0.0007	0.008
U-235	26	13	9	0.04	0.08	5	0.0005	0.006
U-238 (Th-234)	254	130	96	0.3	0.4	20	0.002	0.02
Am-241	14	6	5	0.01	0.02	1	0.00009	0.001