

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH KELLER CANYON PUBLIC PRESENTATION

- Potential sources of radiological contamination at Hunters Point Naval Shipyard
- CDPH interactions with Department of Toxic Substances Control (DTSC)
- CDPH role in the rejected asphalt load of February 2015
- Radiation safety and the public with regard to Keller Canyon landfill

SOURCES OF RADIOLOGICAL CONTAMINATION: HUNTERS POINT NAVAL SHIPYARD

- Radioluminescent (Glow in the Dark) dials and deck markers
- Calibration Sources used to set up radiation detection devices/instruments
- Radiography Sources for portable X-ray machines
- Naval Radiological Defense Laboratory activities
- Peanut Spill, Cs-137 on asphalt, Bldg. 364 (Liquid Radiological Waste Collection Facility)
- Washing down ships contaminated by Atomic Weapons Testing

CDPH AFFILIATION WITH DTSC

- CDPH provides consulting services to Department of Toxic Substances Control (DTSC) on radiological contamination cleanup at the Hunters Point Naval Shipyard and other DOD sites. In this capacity, CDPH performs the following major tasks :
 - Review radiological cleanup work plans, analyze radiological survey data, and conduct confirmatory surveys and sample analysis, and
 - Evaluate data to ensure that the California radiological standards are met so that the site can be released, and subsequently, property can be transferred.

CDPH ROLE IN REJECTED ASPHALT LOAD OF FEBRUARY 2015

- A contacted hauler for Hunters Point got improper access to contaminated asphalt at Hunters Point and proceeded to haul 9 truckloads to Keller Canyon landfill
- A whistleblower at Hunters Point notified CDPH that this happened
- An inspector from CDPH arrived at the landfill to identify which loads were the asphalt
- The truckloads were sent back to Hunters Point along with an additional 11 truckloads of landfill soil to make sure all the asphalt was recovered from the landfill
- Split sampling of the soil showed background levels of radioactivity

CDPH ROLE IN REJECTED ASPHALT LOAD OF FEBRUARY 2015

- Later scanning of the rejected loads found several foot to fist sized pieces of asphalt which were contaminated on one side with Cesium-137

RADIATION SAFETY AND THE PUBLIC WITH REGARD TO KELLER CANYON LANDFILL

- ROUTES OF POTENTIAL RADIATION EXPOSURE TO THE PUBLIC
- TIME, DISTANCE, AND SHIELDING
- NORMAL PUBLIC RADIATION EXPOSURE
- HOW DOES LIVING NEAR KELLER CANYON LANDFILL AFFECT YOUR EXPOSURE

ROUTES OF POTENTIAL RADIATION EXPOSURE TO THE PUBLIC

- DIRECT EXPOSURE (Important if you are on the landfill or near a transport route)
- WIND BORNE DUST (Does dust come off the landfill? How much? Lands where?)
- DRINKING WATER (The water that goes into the landfill is recycled over the landfill)
- CONSUMPTION OF CROPS GROWN ON THE LANDFILL (No crops grown there)

DIRECT RADIATION

- This is the radiation that comes from the radioactive sources and passes through the cover to expose people that are nearby.
- Only gamma radiation can do this. Alpha and beta are stopped by a thin layer of soil.
- Unless you live right on the landfill there would be no exposure by this path unless you live near the roads that the incoming trucks take.
- A measurable exposure rate on an incoming truck would also trigger the sensors at both Hunters Point and the Keller Canyon portal sensors so even if it left Hunters Point it would be caught at Keller Canyon.

WIND BORNE DUST

- Depends on how quickly the soil is covered, how wet the soil is kept to reduce dust and how well the tarping of incoming trucks is enforced
- CDPH has heard that the soil is covered within a day or two, water sprays are used frequently to keep the dust down and that all trucks are tarped
- If dust is a problem the highest exposure would be closest to the landfill

DRINKING WATER

- City of Pittsburg is checking into the drinking water monitoring that is done to ensure public health and safety
- There does not appear to be a pathway between the landfill and drinking water supplies
- Monitoring wells exist around the landfill to verify compliance and that the landfill liner is leakproof

CROPS ON THE LANDFILL

- While no crops would be grown on an active landfill there would be land use restrictions in place to prevent this after site closure
- The site would be clearly recorded so that future generations would be aware of its former use

TIME, DISTANCE, AND SHIELDING

- The total exposure to radiation is figured from how many hours at how many millirem per hour
- Most time calculations for residential use assume that you are at home all the time
- Most time calculations for working environments assume 2000 hours per year
- To calculate exposure time for transportation you would assume a maximum of about one minute since the worst case would be for a house on a transport route next to a slow stoplight. This would need to include how many loads came through each year.

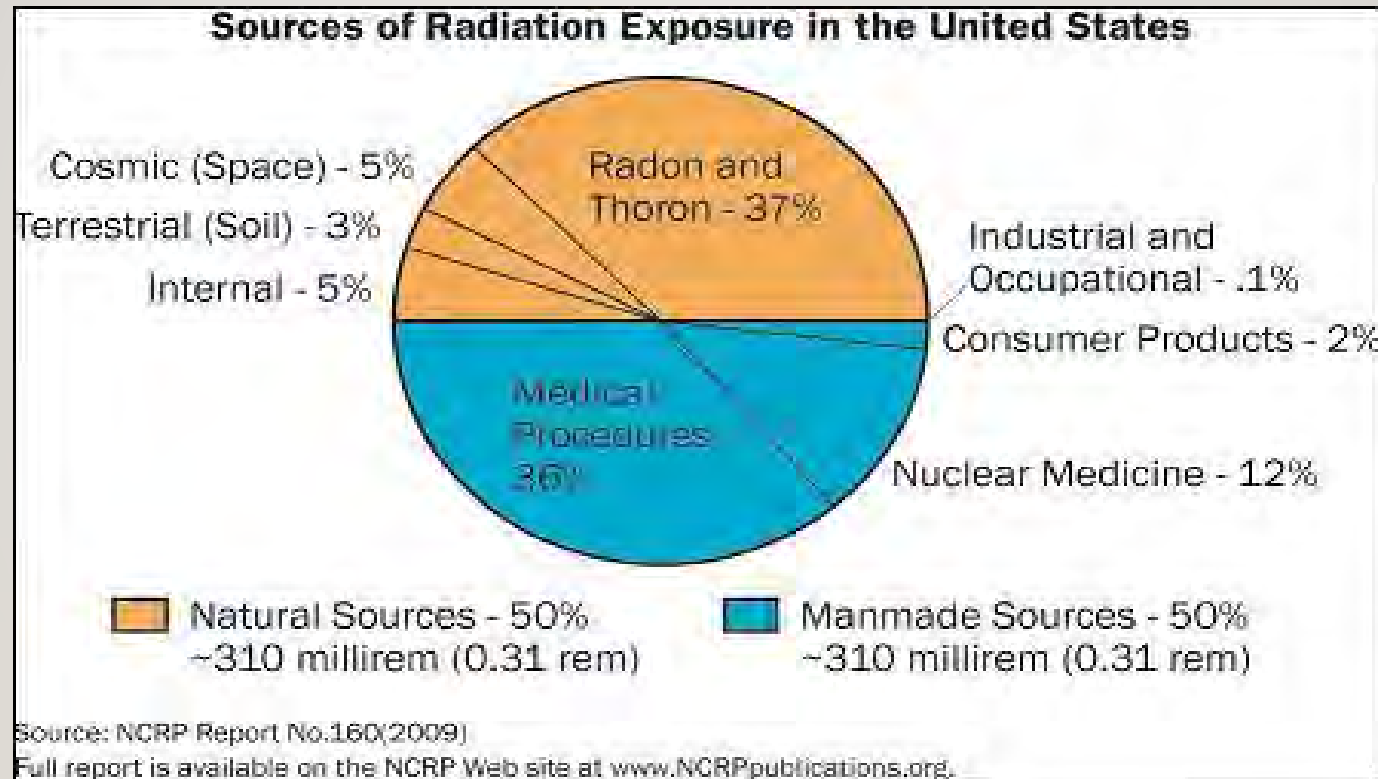
DISTANCE AND SHIELDING

- Every time you double the distance the exposure is cut by four times
- Every time you triple the distance the exposure is cut by nine times
- The landfill is sufficiently far away from residences that no radiation exposure from direct radiation could occur
- Windborne dust would not contain enough contamination to cause measurable exposure unless it was eaten or breathed in. When in the body the distance is zero.
- Transport usually would have at least triple the distance of the close measurement from the load being hauled and so about one ninth of the exposure

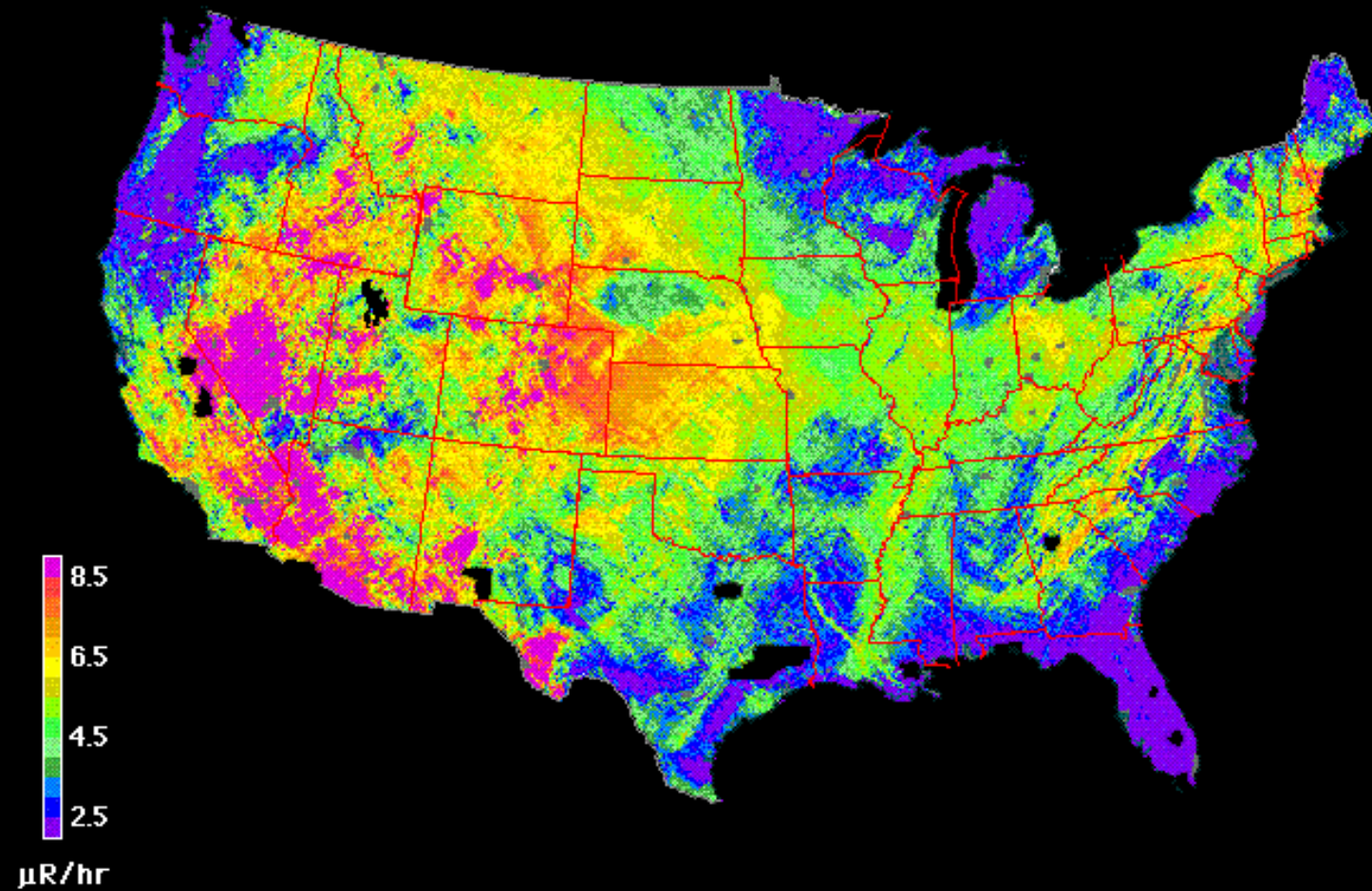
SHIELDING

- Alpha and beta radiation are stopped by a thin layer of soil or wood so they would only be important if they got into the body through being eaten or breathed in.
- Gamma radiation is blocked by a thick layer of soil, concrete or water or a thin layer of lead or iron
- A radioactive source buried in the middle of a load might go undetected because of shielding but then it would be no hazard while being transported. At Hunters Point the soil is supposed to be surveyed in thin layers to make sure all such sources are detected before transport.

NORMAL PUBLIC RADIATION EXPOSURE

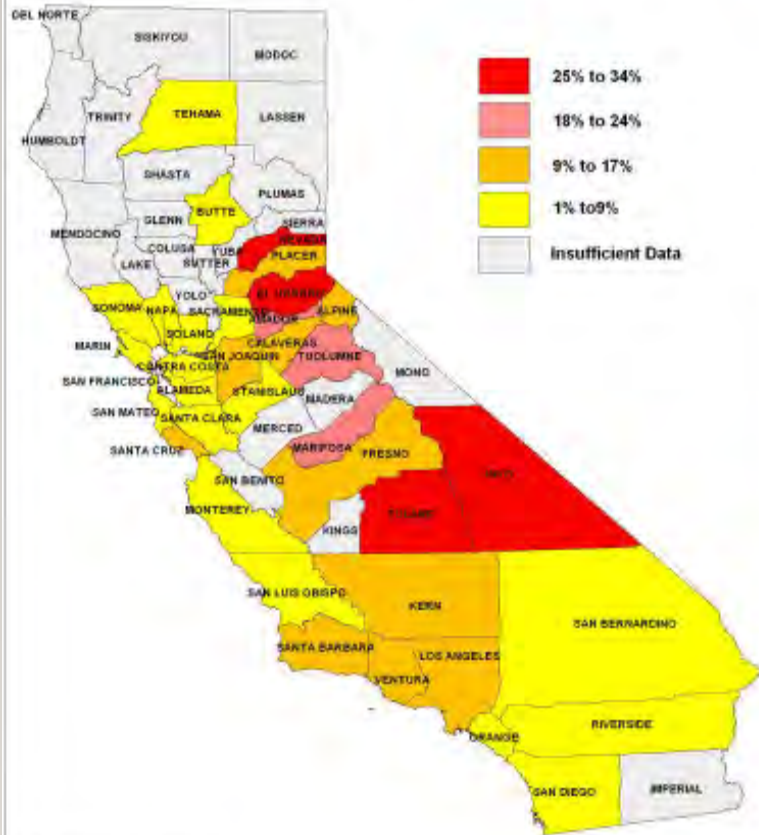


Terrestrial Gamma-Ray Exposure at 1m above ground



Source of data: U.S. Geological Survey Digital Data Series DDS-9, 1993

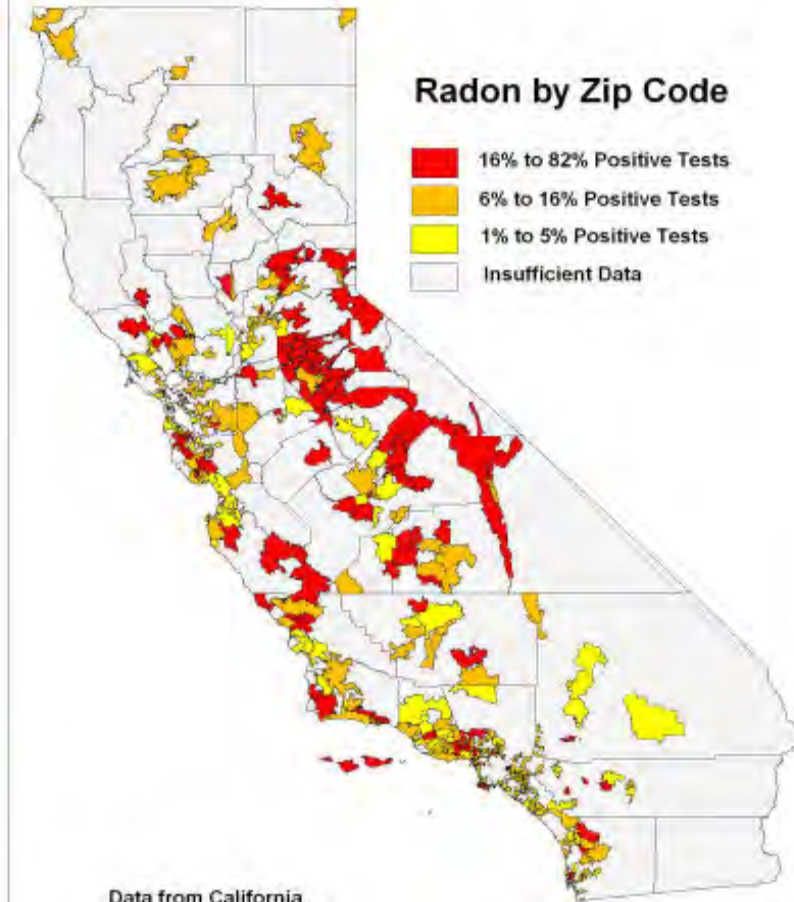
Percent of Radon Tests Above 4 picocuries per liter
 Data from AirChek (<http://www.radon.com>)



Data from Air Chek - radon.com
 and California Department of Health Services

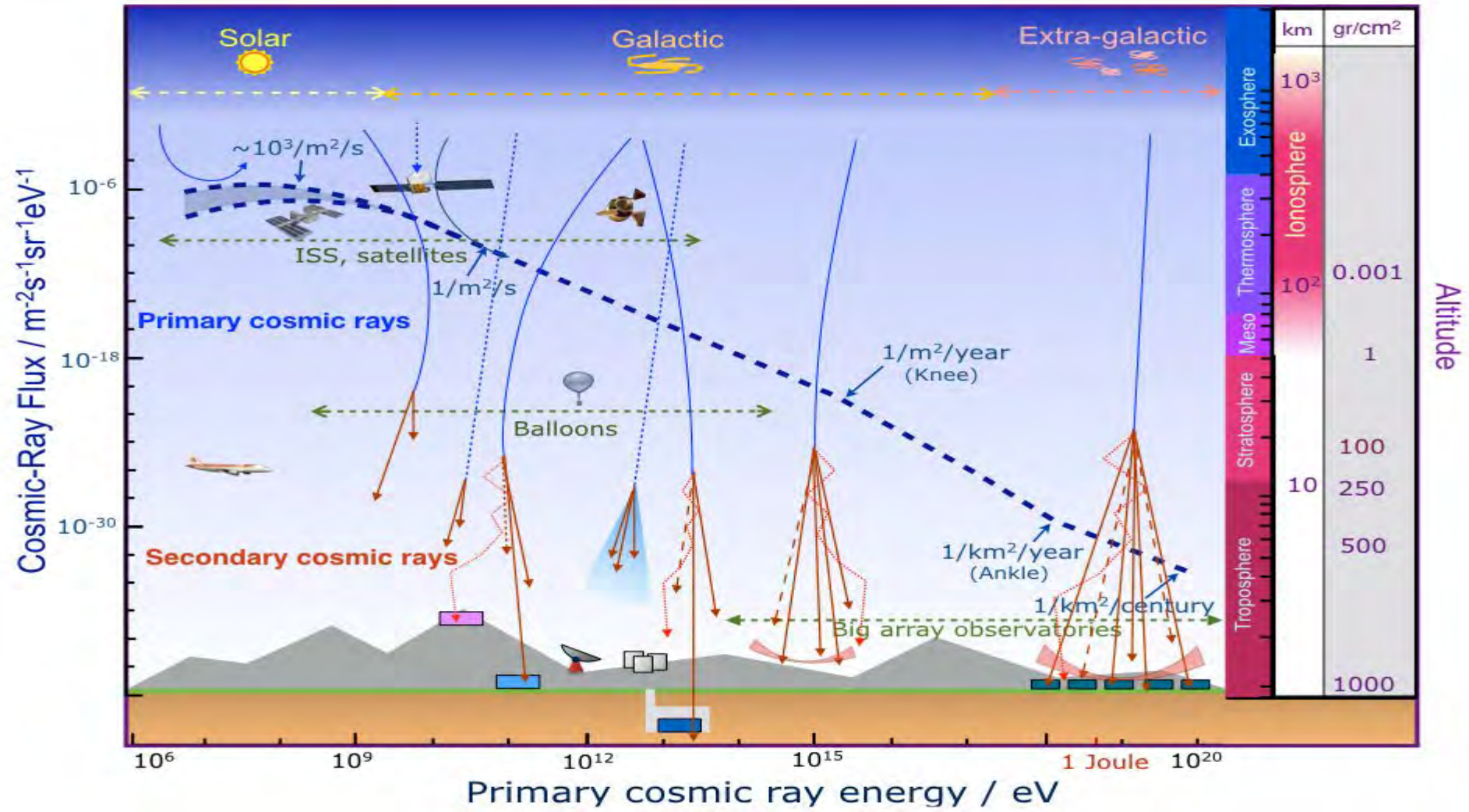
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Radon by Zip Code



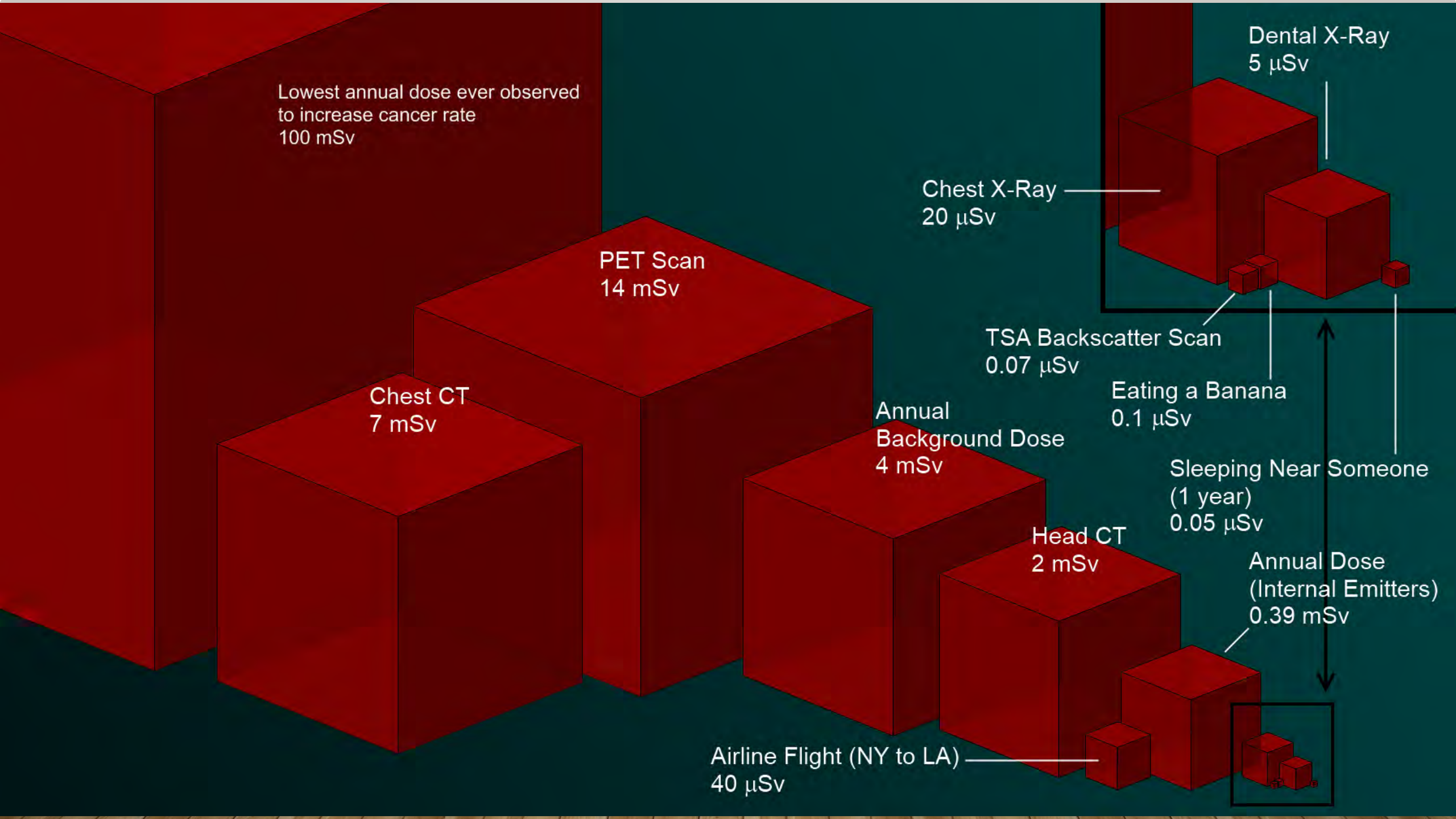
Data from California
 Department of Health Services

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HOW DOES LIVING NEAR KELLER CANYON AFFECT YOUR EXPOSURE

- Considering everything covered so far we have:
 - Transport (Appears to be so low as to not be measurable. Can verify with dosimetry)
 - Direct radiation (Unless you work at the landfill you would have no exposure this way)
 - Drinking water (Appears to be at natural background levels. Still being investigated)
 - Windblown dust (Appears to be low given the precautions against windblown dust)



Lowest annual dose ever observed
to increase cancer rate
100 mSv

PET Scan
14 mSv

Chest CT
7 mSv

Annual
Background Dose
4 mSv

Head CT
2 mSv

Airline Flight (NY to LA)
40 μSv

Chest X-Ray
20 μSv

TSA Backscatter Scan
0.07 μSv

Eating a Banana
0.1 μSv

Sleeping Near Someone
(1 year)
0.05 μSv

Annual Dose
(Internal Emitters)
0.39 mSv

Dental X-Ray
5 μSv

