

Parcel A-2 Final Report Frequently Asked Questions

1. What was the purpose of the project?

As a result of data falsification elsewhere at Hunters Point Shipyard and public concern regarding Parcel A, the US Environmental Protection Agency (US EPA), the Navy, the Department of Toxic Substances Control (DTSC), and stakeholders from the City of San Francisco requested the California Department of Public Health (CDPH) to perform a radiological survey to assess the health and safety of the public and the environment at Parcel A-2. Parcel A-2 is being scanned because it is planned for development with housing units and residents, and because some of the soil excavated during the development of Parcel A-1 was placed at Parcel A-2. This CDPH survey was limited to investigating gamma radiation.

2. What were the major elements of the project?

The CDPH survey included the scanning of all of Parcel A-2 accessible to CDPH staff in order to assess the radiological health and safety of the public and the environment. This survey was designed to detect gamma radiation levels that exist above the nominal background levels that could put public health and safety at risk. This survey employed the use of highly sensitive handheld radiation survey detectors with trained and experienced CDPH health physicists performing gamma walkover surveys of soils and vegetation in accessible areas. In addition, CDPH used a Radiation Solutions RS-700 system that consists of two large volume, highly sensitive gamma mapping detectors to perform gamma scans of two dirt roads and other accessible hardscaped areas and areas where vegetation was absent or less than four inches in height. Any anomalies that were detected were investigated with gamma spectroscopy radioisotope identifiers (Model-Canberra Inspector 1000) that measure the energy range of the suspected anomaly and therefore exactly identify the radioisotope causing the anomalous reading. CDPH employed this instrument 113 times over the course of the project with an additional 26 supplemental readings for data validation purposes.

3. Why didn't you test the soil?

Scanning is the most effective method for detecting discrete (i.e., not uniformly distributed) radiation sources. When the gamma radiation survey detected radiation anomalies above the work plan trigger levels, or radiation that could be a potential concern to public health, additional testing was conducted.

4. Why weren't alpha and beta testing done on Parcel A-2?

Radiation is emitted as alpha, beta, or gamma activity, but only gamma radiation is able to penetrate through soil and vegetation. The alpha and beta testing done on

Parcel A-1 was a separate project to test dust wipes indoors offered to those residents that were interested; there are no buildings or residents on A-2. Even if beta particles were somehow present on A-2, the gamma scan would have detected their surrogate, cesium-137, which is created together during the fission process and one cannot exist without the other also being present.

5. What were the key findings?

Key findings upon completion of the Parcel A-2 project included a total of 113 radiation anomalies, all of which were confirmed to be naturally occurring potassium-40.

6. What is potassium-40?

Potassium-40 is a naturally occurring radioisotope of potassium, omnipresent in the biological world. It is a substance found throughout nature, including in plants, animals, various foods, and our bodies. Detection of potassium-40 is not unusual for a radiation scan of this type and is not a health or safety concern for people or the environment.

7. How did you determine background?

A developed area such as Hunters Point contains dozens of different regions of material composition. For this reason, this survey evaluated every identifiable material mix against itself to look for statistically excessive measurements. If samples are taken in a grassy field and compared to samples from a hard pack clay soil area, the averages and standard deviations of the regions are unlikely to be similar because the elemental composition is different. This approach, comparing readings to what is expected for the material and location, helps to distinguish between normal and anomalous readings.

8. Why were the instruments you used the appropriate type?

The detection instruments that were used are state-of-the-art, highly-sensitive, calibrated, instruments that are appropriate for performing sensitive gamma ray scans. Sodium iodide detectors were used due to their high sensitivity to gamma radiation.

9. How many total static measurements did you perform?

The survey employed the use of highly sensitive handheld radiation survey detectors with trained and experienced CDPH health physicists performing gamma walkover surveys of soils and vegetation in accessible areas. Approximately every 50 feet, surveyors stopped to take one-minute static counts in order to further

validate walkover readings. Over the course of the project, surveyors completed 1,205 total static counts using highly sensitive sodium-iodide 2" x 2" detectors.

10. What is an Inspector 1000 and how many total Inspector 1000 shots did you take?

For walkover radiation survey measurement that was greater than the region's average plus three sigma, CDPH employed the gamma ray identifier (Canberra Inspector 1000), which is an instrument that can display the energy spectra of all gamma ray radioisotopes. Eleven Inspector 1000 shots were taken to evaluate anomalies with an additional 26 shots taken for data validation in areas where walkover gamma scanning was completed. One hundred two Inspector 1000 shots were taken to follow-up anomalies found through towed-array gamma scanning and to identify radionuclides.

11. How did parcel A-2 differ from parcel A-1?

Parcel A-2 is an undeveloped parcel without residential units on it. It has two unpaved roads (Navy Road and Oakdale Avenue). There are no sidewalks or landscaped areas. The hillside of this parcel has been cut and reshaped with borrowed soil from Parcel A-1 to make it suitable for future residential plots. The parcel had overgrown vegetation that was trimmed down recently so that the gamma scanning (both walkover and towed-array RS 700) could be performed. As Parcel A-1 soil was relocated to A-2, an expected amount of mixing would have occurred which would have increased the probability of discrete sources from A-1 being exposed making their detection even more likely. No discrete sources were detected during the A-2 survey.

12. Could rain mask sources of radiation? If so, did it affect the surveying?

All scanning work was performed without rain. It did rain lightly on the last two days when CDPH performed follow-up investigation on anomalies and/or spots with elevated readings. It did not, however, affect our surveying as it did not rain heavily.

13. Did the character of the anomalies differ between parcels A-2 and A-1?

All anomalies found on A-2 were naturally occurring radioactive materials, namely potassium-40. The character of anomalies did not differ from Parcel A-1 except for the two anomalies (one radium deck marker and another low energy peak) that were found on parcel A-1.