

Draft

**Radiological Data Evaluation Findings Report
for Parcels B and G Soil**

**Former Hunters Point Naval Shipyard
San Francisco, California**

September 2017

**Department of the Navy
Naval Facilities Engineering Command
Base Realignment and Closure
Program Management Office West**

Executive Summary

This report summarizes background information and data evaluation activities conducted on the historical radiological data collected by Tetra Tech EC, Inc. (TtEC) at the former Hunters Point Naval Shipyard (HPNS), San Francisco, California, and findings from the evaluation of soil sample data from Parcels B and G. HPNS is divided into parcels, which are further broken down into subparcels or work areas. Separate reports will be provided for interior building surfaces and for soil collected from other parcels at HPNS. This report is limited to the soil data at Parcels B and G. Other parcels and HPNS buildings will be addressed in future reports.

Radiological data collection and removal actions have been previously conducted by contractors¹ at these parcels using Department of the Navy (Navy) and regulatory agency-approved plans based on the Historical Radiological Assessment (HRA) (NAVSEA, 2004) and release criteria documented in the Action Memorandum (Navy, 2006), followed by recommendations for radiological release. There have been various concerns raised regarding the integrity of the data collected during the prior radiological investigation and removal actions at HPNS. Specifically, there are allegations of fraudulent representations of data by TtEC.

The first evidence of soil sample data manipulation and falsification is summarized in the Investigation Conclusion, Anomalous Soil Samples report (TtEC, 2014). TtEC conducted an investigation after Radiological Affairs Support Office (RASO) noted that the final systematic soil sample results from a building site survey unit in Parcel E appeared to be representative of two different data populations, indicating that the soil samples had not been collected where they were purported to have been collected. This report concluded that in addition to this survey unit, 15 survey units and 4 trench units in Parcels C and E had a high probability that the soil samples were not representative of the respective survey units. Seven other locations were identified for further evaluation. TtEC concluded that the persons listed as the sample collectors, either by themselves or in conjunction with others, collected soil samples in areas outside the designated survey units. TtEC implemented a series of corrective actions and considered the action items closed, stating that "TtEC had not had a reoccurrence of the type of anomalous soil sample results that led to this investigation, indicating that the corrective actions have addressed the problem." Ultimately, TtEC conducted rework at each of the survey units identified. However, in the following years, former workers at HPNS alleged additional and more widespread data manipulation and falsification.

Allegations of soil data manipulation and falsification made by former TtEC workers include the following:

- When sufficiently low levels of contamination were not obtained, soil samples were collected from a different area known to have lower radioactivity, and reported as having come from the location being investigated.
- Samples and analytical results were discarded when the results were above the release criteria.
- Instead of collecting soil samples from locations predetermined to have higher gamma scan readings, samples would be collected from nearby soil and represented as having come from the original location.

¹ This term refers to contractors who performed prior work at HPNS and who do not have any involvement in this evaluation. Further, the references herein to work and actions performed at HPNS by other contractors that are the subject of this evaluation are meant to pertain to prior work, including, but not limited to investigation, data gathering, and remediation. The members of the team conducting this evaluation had no involvement in the prior work of other contractors, and this evaluation relies solely on available information and documentation.

- When sufficiently low levels of contamination were not obtained, soil sample collection sites were moved 5 to 10 feet in another direction and a new sample was obtained. The new sample was represented as having been obtained from the original location.
- Chain-of-custody forms were falsified to support the false sample collection information.
- During the screening of overburden soil, actual towed array speeds were greater than allowed speeds, thereby reducing the probability of radiation detection.
- Handheld detectors were used improperly, which may have led to increasing the detection limit of the scanning devices.
- Onsite soil sample results were reviewed and shipment of samples to the offsite lab was blocked if there was a high chance that the release criteria would be exceeded.

In response to the concerns, the Navy assembled a Technical Team (a group of technical experts) to conduct an evaluation of the previous data in light of the claims made. The Technical Team includes representatives from the Navy, United States Environmental Protection Agency, California Department of Toxic Substances Control, California Department of Public Health, the City of San Francisco, and Oregon State University. An independent, third-party team of nationally recognized experts has been contracted to support the Technical Team and perform the evaluation and confirmation investigation. This team includes Battelle, Cabrera Services, CH2M, Perma-Fix Environmental Services, and SC&A Environmental Services and Consulting. Oak Ridge Associated Universities and Argonne National Laboratory have been contracted to provide independent review of reports.

The objective of this evaluation is to review the historical radiological data collected by TtEC at HPNS, assess the potential for data falsification or manipulation, and recommend follow-up data collection to validate previous decisions regarding the property condition. The evaluation process for soil included developing databases; establishing a list of primary radionuclides to evaluate; running statistical and logic tests to identify inconsistencies in soil data; performing graphical data reviews to identify anomalies or unusual trends; identifying historically significant sites to identify where potential contamination could be present and manipulation or falsification of data could have underestimated site conditions; identifying sites based on allegations; developing a form to standardize the assessment and document the data evaluation results for every survey unit; and conducting and documenting data reviews.

Soil sample data from trench units (excavated areas created during removal of storm drains and sanitary sewer lines), fill units (excavated material from trench units that was used as backfill), and current buildings and former building sites (survey units where soil was collected in surrounding areas or in crawl spaces) were evaluated. Based solely on a review of the data previously collected by TtEC and the findings of the data evaluations, recommendations are provided for no further action², reanalysis of archived samples, confirmation sampling, or physical inspection of archived samples. These recommendations are defined as follows:

- **No Further Action** – No further evaluation of the data is recommended during this phase of the project as it did not appear that data manipulation or falsification by TtEC had occurred. This designation is not meant to apply beyond the evaluation of the data and does not preclude other actions that may be taken by the Navy.
- **Reanalysis of Archived Samples** – Reanalysis of the archived soil samples (samples collected by TtEC that may be available in onsite storage) collected as initial systematic sample data at an offsite

² No further evaluation of the data is recommended during this phase of the project as it did not appear from the scope of this data evaluation that data manipulation or falsification by TtEC had occurred. This designation is not meant to apply beyond the evaluation of the data and does not preclude other actions that may be taken by the Navy.

laboratory is recommended. The evaluation indicated evidence of potential data manipulation or falsification given the methods used to review the data. The purpose for the reanalysis is to a) compare the initial systematic sample results to the release criteria to see if the results may reveal that the release criteria were met and remediation was not required³ even though final systematic sample results were potentially manipulated and falsified, or b) provide offsite laboratory results to document current site conditions.

- **Confirmation Sampling** – Collection of additional data (surveys, scans, or soil samples) is recommended during this phase of the project. The evaluation indicated evidence of potential data manipulation or falsification based upon the methods used to review the data. The available data are suspect and additional data are needed to document current site conditions. Task-specific plans will be provided detailing the extent of the confirmation sampling activities.
- **Physical Inspection of Archived Samples** – Physical inspection of archived soil samples (samples collected by TtEC that may be available in onsite storage) is recommended during this phase of the project. The evaluation indicated evidence of potential data manipulation or falsification based upon the methods used to review the data. The purpose of the physical inspection of the samples is to determine whether the physical soil characteristics are what would be expected given the sample's collection location. This comparison will help determine whether data have been manipulated or falsified.

The following sections summarize the findings and recommendations of the soil data evaluation for Parcels B and G.

Parcel B

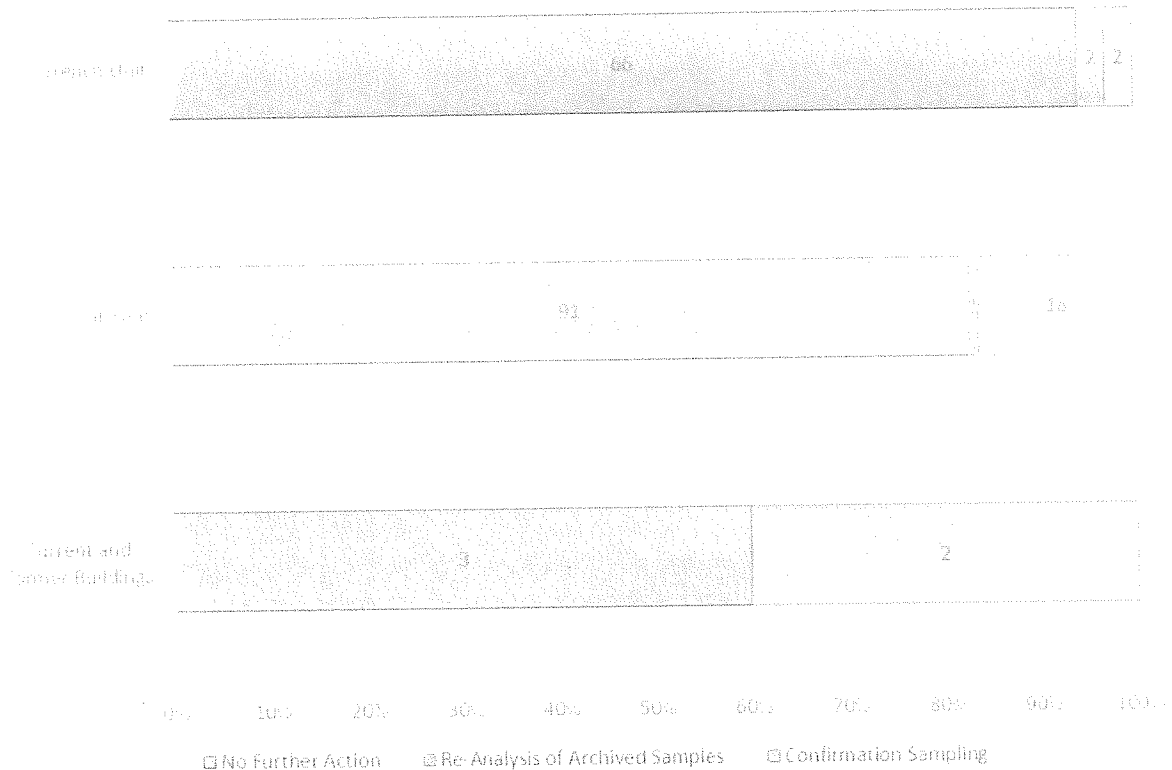
The areas evaluated in Parcel B included 70 trench units, 110 fill units, and 5 current and former building sites with 17 soil survey units. More than 8,000 soil samples were collected from these areas from 2005 through 2010. Based solely on a review of the data previously collected by TtEC and the findings of the data evaluations, the following recommendations are provided:

- **Trench units** - There was no evidence of potential data manipulation or falsification identified at 66 of the 70 trench units evaluated; therefore, no further action is recommended. There was evidence of potential data manipulation or falsification at the remaining four trench units. Reanalysis of archived samples is recommended at two trench units, and confirmation sampling is recommended at two trench units.
- **Fill units** - There was no evidence of potential data manipulation or falsification identified at 91 of the 110 fill units evaluated; therefore, no further action is recommended. There was evidence of potential data manipulation or falsification at the remaining 19 fill units used as backfill for 17 trench survey units. Reanalysis of archived samples is recommended at 1 fill unit, and confirmation sampling is recommended for the other 18 fill units. Of the 18 fill units, 17 were recommended for confirmation sampling based on evidence of biased sample collection at locations to potentially avoid the highest gamma scan measurements.

³ Ra-226 results were reported by the onsite laboratory using a screening method based on the 186 keV energy peak. The offsite laboratory analyzed Ra-226 using a definitive method, allowing the soil samples to equilibrate (21-day in-growth) and reported concentrations using the 609 keV energy peak for Bi-214. Comparisons between the onsite laboratory screening results and the offsite laboratory definitive results for Ra-226 demonstrate the onsite laboratory results were consistently biased high. The Ra-226 analytical results from the onsite laboratory resulted in false exceedances of the release criteria, which resulted in the initiation of remediation. Remediation may have been avoided had soil samples been allowed to equilibrate (21-day in-growth) and decisions had been based on the more reliable Bi-214 analysis using the 609 keV energy peak. The screening method used by the onsite laboratory was selected to allow for rapid decision making during field investigations and to prevent health and safety concerns associated with large open excavations.

- **Current and Former Building Sites** - There was no evidence of potential data manipulation or falsification identified at 3 of the 5 buildings evaluated (9 out of 17 survey units); therefore, no further action is recommended. There was evidence of potential data manipulation or falsification at the other 2 buildings (8 out of 17 survey units), and confirmation sampling is recommended.

Parcel B



Parcel G

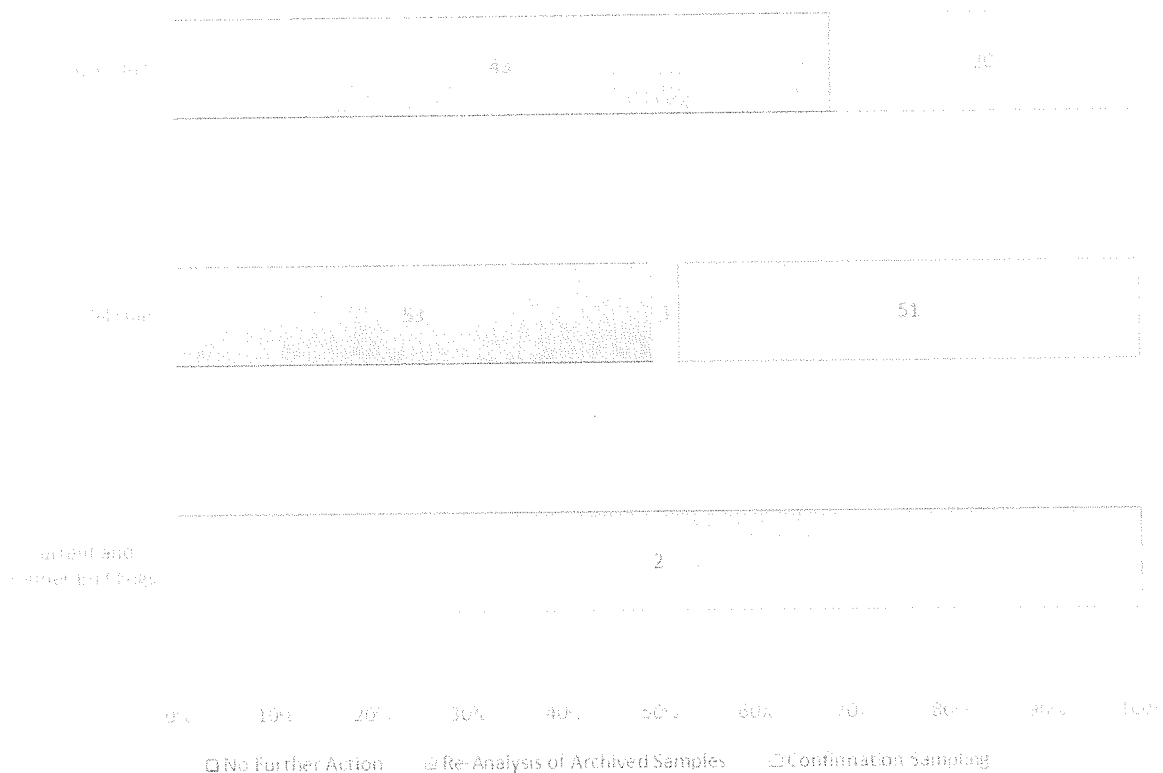
The areas evaluated in Parcel G included 63 trench units, 107 fill units, and 2 current and former building sites with 32 soil survey units. More than 12,000 soil samples were collected from these areas from 2002 through 2011. Based solely on a review of the data previously collected by TtEC and the findings of the data evaluations, the following recommendations are provided:

- **Trench units** - There was no evidence of potential data manipulation or falsification identified at 43 of the 63 trench units evaluated; therefore, no further action is recommended. There was evidence of potential data manipulation or falsification at the remaining 20 trench units, and confirmation sampling is recommended.
- **Fill units** - There was no evidence of potential data manipulation or falsification identified at 53 of the 107 fill units evaluated; therefore, no further action is recommended. There was evidence of potential data manipulation or falsification at the remaining 54 fill units used as backfill for 28 trench survey units. Reanalysis of archived samples is recommended at 3 fill units, and confirmation sampling is recommended for the other 51 fill units. Of the 51 fill units, 46 were recommended for

confirmation sampling based on evidence of biased sample collection at locations to potentially avoid the highest gamma scan measurements.

- Current and Former Building Sites - There was evidence of potential data manipulation or falsification at the 2 buildings (25 out of 32 survey units) evaluated, and confirmation sampling is recommended.

Parcel G



Assumptions and Uncertainties

The following assumptions and uncertainties are associated with this evaluation:

- This evaluation is based solely on available data. The procedures were developed to identify the potential for manipulation or falsification of soil samples previously collected by TtEC at HPNS. This evaluation should be used to identify recommended sampling locations and as a tool to help determine where additional data should be collected.
- Evidence of potential data manipulation and falsification was discovered during the Navy's soil data evaluation of Parcels B and G. Because it is impossible to determine whether every instance of potential data manipulation or falsification has been identified, the Navy recommends additional surveys and sampling beyond the areas with evidence of data manipulation. Additional soil sampling locations will be selected in coordination with the regulatory agencies.