UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA

October 22, 2018

George ("Pat") Brooks
US Department of the Navy
33000 Nixie Way, Bldg 50
San Diego, CA 92147

Dear Mr. Brooks:

Thank you for providing for review the Navy's October 11, 2018, Responses to Comments (RTCs) on the *Draft Parcel G Removal Site Evaluation Work Plan*, Hunters Point Naval Shipyard, San Francisco, California, June 15, 2018 ("Work Plan"). The U.S. Environmental Protection Agency (EPA) has independently reviewed this report in detail with a technical team including national experts in health physics, geology, and statistics, and our comments are attached. We appreciate that the RTCs show that the Navy made significant changes in its Work Plan to adopt the recommendations of EPA and State of California regulators. Based on these RTCs, we expect the new revised Work Plan will protect public health and the environment while moving expeditiously to get the answers we all want as soon as possible. We look forward to reviewing the revised workplan closely as soon as we receive it.

In some cases, the RTCs state that "the Navy has incorporated the regulatory agencies' retesting proposal into the work plan in the interest of gaining concurrence and collecting data as soon as possible," and the Navy restates its previous position in the RTCs, which is contrary to EPA's. If the Navy chooses to restate its position in the test of the Draft Final, then in each instance, for clarity to the reader, please identify that as the Navy's position, not the regulatory agency's position, and please state that we have agreed to disagree. Comments are attached for the purpose of providing clarity to the reader in this and other ways. In addition, we understand that more details will come from the Navy in the next revision of the Sampling and Analysis Plan (SAP) and other documents. EPA will also carefully review those before retesting begins.

We look forward to working with the Navy to finalize both the Work Plan and the SAP and begin the sampling component of the radiological assessment effort as soon as possible. If you would like to discuss any of these comments, please contact me at 415-947-4187 or [HYPERLINK "mailto:lee.lily@epa.gov" \h] [OR 415-972-3005 or chesnutt.john@epa.gov.]

Sincerely,

Lily N. Lee
Remedial Project Manager
Superfund Division
[OR John Chesnutt
Manager, Pacific Islands and Federal Facilities Section
Superfund Division]

Attachment

cc: Nina Bacey, State of California Department of Toxic Substances Control
Matthew Wright, State of California Department of Public Health
Tina Low, California Regional Water Quality Control Board
Amy Brownell, San Francisco Department of Public Health

[OR Julie Pettijohn, DTSC
Sheetal Singh, CDPH
Alec Naugle, California Regional Water Quality Control Board
Amy Brownell, San Francisco Department of Public Health]

EPA Review of the Responses to EPA Comments on the Draft Parcel G Removal Site Evaluation Work Plan, Hunters Point Naval Shipyard, San Francisco, California, October 2018

The following comments were generated based on an Evaluation of the Responses to EPA Comments on the Draft Parcel G Removal Site Evaluation Work Plan, Hunters Point Naval Shipyard, San Francisco, California (WP). A revised WP has not yet been submitted, therefore it can not be determined if the all of the EPA concerns have been addressed and whether they were sufficiently added to the WP. The responses including, but not limited to General Comments 1, 2, 3, 4, 6, 10, 11, 12, 13, 15, 16, 18, 21, and Specific Comments 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 21, 22, 23, 25, and 26, cannot be fully evaluated until the revised WP is received. Similarly, the responses including, but not limited to General Comment 7, and Specific Comment 21, cannot be fully evaluated until the revised Parcel G Removal Site Evaluation Sampling and Analysis Plan, Former Hunters Point Naval Shipyard, San Francisco, CA (SAP) is received.

Responses to EPA General Comments 5, 8, 12a, and 16: The responses appear to indicate that providing a point by point comparison of data with the Parcel G Record of Decision (ROD) Remedial Goals (RGs) is not as valid as using the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) Wilcoxon Rank Sum (WRS) test, which compares the medians of the data set and the background data set for assessing compliance with cleanup standards. However, the Remedial Action Objective (RAO) for radiologically impacted soil and structures in the Parcel G ROD states, "Prevent exposure to radionuclides of concern in concentrations that exceed remediation goals for all potentially complete exposure pathways." During all previous removal and remedial actions, this has been implemented as a comparison of each data point to the RGs listed in the ROD for all radionuclides of concern (ROCs) such that any exceedences are required to be excavated or removed from building surfaces. Therefore, the approach proposed by the regulators of performing a point by point comparison of all data to the RGs is consistent with the approach taken previously to demonstrate compliance with the ROD and is more conservative than performing the WRS test. Please ensure that the WP requires demonstrating that each data point meets the ROD-specified RG in order to demonstrate the cleanup goals have been achieved.

Response to EPA General Comment 6: The response does not appear to be consistent with the Parcel G ROD. The ROD states in relation to radiological cleanup, "Buildings, former building sites, and excavated areas will be surveyed after cleanup is completed to ensure that no residual radioactivity is present at levels above the remediation goals." The Parcel G ROD also states, "The Selected Remedy for radiologically impacted soil and structures consists of surveying radiologically impacted buildings and former building sites with documented radiological impacts for unrestricted release." Therefore, conducting a 100% survey of trench units (TUs) and building survey units (SUs) is consistent with the ROD.

Responses to EPA General Comments 9 and 18 item a: The response to General Comment 9 states, "The Navy conducted preliminary calculations of the risk using the USEPA's Preliminary Remediation Goal (PRG) Calculator and found that the current RGs are within the risk management range of 10E-04 to 10E-06." However, documentation that demonstrates

compliance with the risk management range has not been provided. Please provide the PRG calculator documentation that demonstrates the current RGs will fall within the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA) mandate that the excess lifetime cancer risk from carcinogenic substances does not exceed the risk range of 10E-04 – 10E-06.

Responses to EPA General Comment 12 and Statistical Review Specific Comments: The responses should be clarified. The responses to statistical comments state that the Navy believes the MARSSIM methodology would best determine compliance but that MARSSIM will not be followed at the direction of the EPA. However, the responses appear to cite MARSSIM and other Nuclear Regulatory Commission (NRC) documentation (e.g., NUREG-1505) when those guidance documents justify the proposed methodology, such as background reference area sample sizes. The methodology to establish compliance/non-compliance for Parcel G proposed by the Regulatory Agencies provides a statistical basis and associated statistical confidence levels to support the decision-making process and incorporates MARSSIM components where they are applicable. It is not possible to apply MARSSIM in its entirety in a defensible manner when evaluating Parcel G at HPNS for the following reasons:

- MARSSIM only addresses surface contamination in soil and in buildings, it does not address contamination that may be present at depth, such as within the TUs in Parcel G.

- MARSSIM requires comparisons based on a modeled derived concentration guideline level (DCGL); however, the RAO for Parcel G is not based on a DCGL, but on not exceeding the RGs, which has been implemented as point-by-point comparisons to specified RGs as discussed above.

As such, the WP should be updated to ensure that it conforms to the previous implementation of the ROD definitions of the RGs in relation to background levels, which are expected to be statistically computed:

- The Executive Summary, DQOs (in Sections 3 and 4), and Section 5 should be revised to reflect the following:

  – If the investigation results demonstrate there are no exceedances determined from a point by point comparison with the statistically based RGs at agreed upon statistical confidence levels, or that site conditions are representative of background and naturally occurring material, then a remedial action completion report (RACR) will be developed.

  – If the investigation results demonstrate exceedances of the RGs determined from a point by point comparison with the statistically based RGs at agreed upon statistical confidence levels and are not representative of background and naturally occurring material, remediation will be conducted and a RACR will be developed.

  – The RACR will describe the results of the investigation and any remediation performed, compare the distribution of data from the sites with applicable reference

area data, and provide a demonstration that site conditions are compliant with the Parcel G Remedial Action Objectives through the use of multiple lines of evidence including application of statistical testing with agreed upon statistical confidence levels on the background data.

Further, the response to part d on Page 5 also requires further clarification with respect to the use of NUREG-1505. The Parcel G WP proposed the use of NUREG-1505, Table 13-5 as the appropriate reference for justification of sample sizes at background reference areas (RBAs). Regulatory Agency comments included the need for clarification of how NUREG-1505 was applied to derive sample sizes proposed for the RBAs. As such, the following clarifications are requested:

- The response states, "Text has been added to the Soil Reference Background Area Work Plan to describe the number of samples calculation for the RBAs. Twenty-five surface and 25 subsurface soil samples will be collected from each RBA location. This will result in up to 10 reference area data sets of 25 samples each from 5 different RBA locations (1 surface and 1 subsurface soil data set from each RBA location)."
  - Because some RGs are based on background levels of the ROCs, it is essential that statistically and technically sound methodology is adhered to when designing the reference background study, so as to obtain representative estimations of the true background levels present on HPNS. Adequate sample sizes are required to ensure the validity and defensibility of the final established background levels that will be used at HPNS. At this time, it is unclear whether surface and subsurface levels of ROCs will differ significantly, therefore the two depths should be treated as independent data sets until proven otherwise. It is also unclear how much the RBAs will differ in soil type both at surface and at depth and whether they will be representative of surface soils and within the TUs present on Parcel G. The WP should discuss how soil types will be evaluated and compared with soil types found at Parcel G.

- The response states, "The NRC criteria for providing characterization of a complex site, found in NUREG 1505 (Section 13.5, page 13-11, last paragraph, second sentence), states that "four reference areas each with between 10 and 20 samples in each should generally be adequate" (NRC, 1998)."
  – The purpose of this text in the NUREG document is not to state that 4 RBAs are sufficient. Taken in context, the NRC is discussing the application/interpretation of Table 13.5 in the document which approximates the associated power of a Kruskal-Wallis test. The entire sentence states: "Although this is only an approximation, and the actual power of the Kruskal-Wallis test would be slightly lower, this table indicates that with four reference areas each with between 10 and 20 samples in each should generally be adequate.

- The response states "Based on Table 13.5, Power of the F-test when $\omega 2=\sigma 2$ in NUREG-1505 guidance, 20 samples collected from each of six reference area data sets will provide 95 percent confidence that the reference area data sets can be combined if they are similar."

- The Navy and EPA have agreed that sample collection at the off-site RBA is being conducted to meet different objectives than the four on-site RBAs. Only the four on-site RBAs should be considered if Table 13.5 of NUREG-1505 is used to justify adequate sample sizes for the RBAs.

- The response states, "The power of this test is 99 percent, meaning there is a 1 percent probability that the data sets will be incorrectly combined when they are not similar. The proposed survey design includes collecting 25 samples from each of up to 10 reference area data sets, providing a power greater than 99 percent while maintaining 95 percent confidence that the RBA data sets can be combined if they are similar."
  - The standard of the α-level and β- level = 0.01 in was set in the original WP. This implies that there is no more than a 1% chance determining two RBAs can be combined when they are not from the same background population and there is no more than a 1% chance of determining that two RBAs cannot be combined when they are actually from the same background population. Both decisions are equally important to establishing background levels at HPNS and the WP should discuss them equally.
  - The number of samples needed per RBA depends on both the probability of a Type I error (α) and the probability of a Type II error (β) that are deemed acceptable for the test. $1-\beta$ = power.
  - Table 13.5 does not include sample sizes for α= 0.01, however it can be extrapolated from the tabulated values for α= 0.05, that at least 25 samples per each of the five on-site RBAs are needed to achieve the required power ($1-\beta = 1-0.01 = 99\%$) for α= 0.01. As documented above, NUREG-1505 recognizes "the actual power of the Kruskal-Wallis test would be slightly lower" than the tabulated values.

The adequacy of revisions to the forthcoming revised WP and SAP will need to be evaluated upon receipt by the regulators to ensure the revisions are consistent with the general intent of the suggested language and are commensurate with the Parcel G ROD requirements and the proposed data evaluations. Please ensure that these issues are addressed in the WP and SAP.

Response to EPA General Comment 15: The responses to items f and g state that the standard operating procedures (SOPs) are included in Appendix C; however, some SOPs for radio-analytical methods were not included in the original versions of the WP and SAP. Please ensure all sampling and laboratory-specific SOPs for all radio-analytical methods are included in the revised WP and SAP.

Response to EPA General Comment 17: The response does not address the original concern regarding the lack of specific discussions in the WP of what variance will be used to calculate the required number of samples, or how newly collected data will be used to update the variance and the required number of samples for on-going survey unit investigations and Final Status Surveys (FSS). Please ensure revisions to the WP, and as appropriate, the SAP include a discussion explaining how variance from newly collected data sets will be used to re-run the MARRSIM calculations for determining the statistically-required number of samples for future/on-going survey unit sampling for soil TUs/SUs and in building survey units.

Responses to EPA General Comment 18, item e and f: The response to item e references the response to EPA General Comment 5 and does not address the concern. Please ensure that information explaining how the number of static measurements for each SU are calculated using the MARSSIM equations is provided in the revised WP. Please also ensure that the WP requires inclusion of a listing of the variance used and reference to the data set that the variance was obtained from, as well as all equations and calculations when the results of the calculations are provided.

Response to EPA General Comment 19: The response does not address the comment; however, it is understood from discussions with the Navy on Tuesday, October 15, 2018, that all reportable isotopes for Uranium (U-234, U-235, U-238) and Thorium (Th-230, Th-234) from the alpha spectroscopy analysis, as well as Radium-226 will be reported. Please ensure the revised WP includes this information.

Response to EPA General Comment 22: The response should be clarified. Specifically, the response discusses the need for characterizing the impact of erosion and runoff in order to evaluate concentrations of background versus site contamination of Cesium-137; however this proposal was not included in the original WP and SAP. The discussion on October 15, 2018 indicated that this characterization will not be done; however, the response should be clarified. Please explain the intent of the last sentence of this response and revise it as necessary.

Response to EPA Statistical Review Specific Comment (Page 8, bottom): The response does not address the actual comment. The specific statistical hypothesis statements that will be tested to establish compliance should be provided. These statements should be incorporated into the data quality objectives (DQOs) for the project, including proposed confidence levels as well as alpha, beta, and power associated with the testing. The MARSSIM WRS test is not the only option for statistical testing. Point-by-point comparisons can be achieved with defined statistical confidence through the use of decision statistics such as Upper Tolerance Limits (UTLs). Please revise the work plan to include the specific decision statistic that will be used based on the distributional properties of the newly collected reference background data and subsequent sampling results of the TUs/SUs.

Response to EPA Specific Comment 4: The original EPA Specific Comment 4 was referencing information provided in the Parcel G Data Evaluation Forms. There are several forms that indicate that piping was not found north of a TU (e.g., TU 84) or east or west of a TU, when the associated figure indicates that piping should have been connected to another TU. For example, TU 151, Section 4, states that no piping was found to the east or west of this TU, but the figure indicates that there is an east-west section of piping that was connected to TU 84 on the west and to TU 86 on the east. As such, it is unclear if all of the piping has been removed.

In addition, the concern is based on contradictory text in WP Section 2 (Conceptual Site Model) which states that open sanitary sewers and storm drains were left in place and were plugged during the removal process. Also, Table 2-1, Conceptual Site Model Uncertainties discussion states, "Sanitary sewers and storm drains, and 1 foot of soil surrounding the pipe removed. The sewer lines were removed to within 10 feet of all buildings. Impacted buildings had remaining lines removed during surveys of the buildings. Non-impacted buildings had surveys performed at

ends of pipes, and pipes were capped." Please revise the Work Plan to address possible uncertainties about the extent of investigation of sanitary sewer and drain lines at Parcel G, and to also specifically state whether information exists to confirm whether sufficient investigation, and as needed, removal of piping and lines was completed at TUs 83, 84, and 123.

Responses to EPA Specific Comments 16 and 19: The responses do not address the comments; however, it is understood from discussions with the Navy on October 15, 2018, that all reportable isotopes for Uranium (U-234, U-235, U-238) and Thorium (Th-230, Th-234) from the alpha spectroscopy analysis, as well as Radium-226 will be reported. Please ensure the revised WP includes this information.

Response to EPA Specific Comment 24: The response addresses the comment; however, further details about how the electronic data will be managed and transmitted to EPA is requested. Please include this information in the forthcoming revised WP and as appropriate, SAP.