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REGION IX
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**STATE OF HAWAII
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July 26, 2017 -

Mark Manfredi
Red Hill Regional Program Director
Naval Facilities Hawaii
400 Marshall Road
Joint Base Pearl Harbor Hickam, Hawaii 96860

Re: Red Hill Administrative Order on Consent Statement of Work (“AOC SOW”)- Conditional Approval of Section 4.5 New Release Detection Alternatives of Scope of Work dated June 19, 2017

Dear Mr, Manfredi:

The U.S. Environmental Protection Agency (“EPA”) and Hawaii Department of Health (“DOH”), collectively the “Regulatory Agencies”, have reviewed the *New Release Detection Alternatives Scope of Work at Red Hill, Hawaii* dated June 19, 2017 (“Release Detection Scope”) and submitted by the U.S. Department of Navy (“Navy”) and Defense Logistics Agency (“DLA”). The Regulatory Agencies have also reviewed comments received on July 14, 2017 from the Honolulu Board of Water Supply (“Board”) on the Release Detection Scope and are attaching the Board’s comments to this letter. Although the Release Detection Scope is presented as an outline, the Regulatory Agencies are confident that this document provides sufficient detail to develop a study that analyzes and improves release detection for the large tanks at the Red Hill Bulk Fuel Storage Facility (“Facility”) and to submit a satisfactory *New Release Detection Alternatives Report* (“New Release Detection Report”). The Regulatory Agencies are approving the Release Detection Scope with the conditions detailed in this letter.

As you know, robust release detection technology is critical for limiting the volume of fuel that may be released in the event of a Red Hill tank system failure. Improvements in release detection and associated alarm and response procedures may present a substantial opportunity to reduce the risk from releases at the Facility. The primary objective of the upcoming New Release Detection Report required under section 4.6 of the Red Hill AOC SOW is to identify new technologies or improvements to existing technologies for detecting fuel releases from the large bulk field-constructed tanks at the Facility. The New Release Detection Report and any resulting site specific testing outlined in this Release Detection Scope are limited to detection of releases in the tanks’ primary containment. The Navy and DLA shall evaluate the performance of release detection technologies designed to detect the presence of leaks

between primary and secondary containment as part of the Tank Upgrade Alternatives Report required under section 3.3 of the Red Hill AOC SOW.

Through scoping discussions with the Navy and DLA, the Regulatory Agencies suggested that the static leak detection portions of this study involve the simultaneous testing of appropriate technologies. Ideally, tests should be performed on a single Red Hill tank under various simulated leak conditions to gather facility specific data on a technology's capabilities rather than rely on vendor claims and generic third-party validations. Therefore, much of work to be done under this Release Detection Scope involves the implementation of site-specific testing. The Regulatory Agencies seek substantial involvement in the development of the testing protocol and data analyses, and suggest the Navy and DLA also provide transparency for external subject matter experts.

The Regulatory Agencies understand that technology currently employed at the Facility can detect relatively small releases during periods when fuel remains static in the tanks, but our understanding is that the resolution decreases substantially during periods when fuel is being either delivered to or dispensed from the tanks. The Navy and DLA should clarify that either this section of the Red Hill AOC SOW or the Risk and Vulnerability Assessment under section 8 of the Red Hill AOC SOW will assess both the maximum volumes of fuel releases that could go undetected during tank filling and dispensing periods. In this clarification, the Navy and DLA should also identify the technologies and/or procedures that will be used to reduce the volume of fuel that could go undetected during filling and /or dispensing periods.

The Regulatory Agencies also understand that recommissioning of a tell-tale system will also be studied as part of this Release Detection Scope. Although a new tell-tale system may provide some benefits, the Regulatory Agencies remain concerned about this potential recommissioning. A tell-tale system will likely only be a qualitative or binary system and will not likely be able to provide quantitative information about a release. A tell-tale system alone cannot be considered monitoring of an interstitial space for the current tank construction because our understanding is that the current concrete portions of the tanks have not been engineered to be liquid tight. Also, we do not see an effective way to test the outer concrete tank shell for liquid tightness at the resolution consistent with regulatory standards. In addition, there will likely be release response and regulatory implications for releases detected in the tell-tale system outside the tanks' steel liner.

Release detection will likely be a substantial aspect of the Best Available Practicable Technology ("BAPT") selected as part of the tank upgrade decisions. The decision matrix developed as part of the New Release Detection Report should assist in the assessment of BAPT options. Therefore, the Navy and DLA should describe how the release detection tests and results will be utilized in future tank upgrade alternatives decisions.

The Release Detection Scope is approved with the following conditions:

- 1) The Navy and DLA shall submit to the Regulatory Agencies for review and concurrence the workplan developed by the prime contractor selected to complete the New Release Detection Report. This detailed workplan developed by the contractor should provide more technical detail than that of the Release Detection Scope.

- 2) The Navy and DLA shall substantially involve the Regulatory Agencies in the development of the test protocol for static leak detection testing of identified vendors by allowing our technical experts to collaborate with the Navy and DLA team tasked with the development of the test protocol.
- 3) The Navy and DLA shall seek concurrence from the Regulatory Agencies on the test protocol for static leak detection prior to its implementation.
- 4) The Navy and DLA shall provide the Regulatory Agencies with an analysis of maximum volumes of potential fuel lost under current and improved static leak detection and alarm response protocols either as part of this study or part of the Risk and Vulnerability Assessment. This will allow for an assessment of potential consequences likely under the range of leak detection and alarm response procedures for the various release detection options.
- 5) As part of the first check-in meeting with the Regulatory Agencies, the Navy and DLA shall provide further detail in writing on how the portion of the study related to quantification of maximum volume of undetected fuel released during filling/dispensing periods and opportunities for reducing these volumes will be addressed.
- 6) Prior to the first check-in meeting with the Regulators, the Navy and DLA shall provide an issue paper providing further detail on the process to be used to study the pros and cons regarding recommissioning of a tell-tale system and seek concurrence from the Regulatory Agencies prior to proceeding with the tell-tale portion of the study.
- 7) The Navy and DLA shall develop an issue paper describing the strategy for utilizing the information gained as part of the leak detection study in the overall BAPT decisions prior to developing the decision matrix for leak detection. Navy and DLA shall also describe how the information from this study will be considered as part of the Tank Upgrade Alternative decision process.
- 8) The Navy and DLA shall propose attributes to be included in the decision matrix for the Regulatory Agencies' concurrence.
- 9) The Navy and DLA shall provide an updated schedule for implementation of New Release Detection Report that considers the conditions of this approval prior to the first check-in meeting with the Regulatory Agencies.

Per section 4.6 of the Red Hill AOC SOW and Section D. of Release Detection Scope submitted by Navy and DLA, the New Release Detection Report shall be submitted to the Regulatory Agencies for approval one year from the date of this letter. Should you have any questions about this conditional approval, do not hesitate to contact us.

Sincerely,

Robert Pallarino

Bob Pallarino
EPA Red Hill Project Coordinator



Steven Chang, P.E.
DOH Red Hill Project Coordinator

Enclosure

cc: Captain Richard D. Hayes III, Navy (via email)
John Montgomery, Navy (via email)

BOARD OF WATER SUPPLY

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July 14, 2017

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Dear Messrs. Pallarino and Chang:

Subject: Board of Water Supply (BWS) Comments to the Red Hill Administrative Order on Consent (AOC) Section 4.5 New Release Detection Alternatives [Report] Scope of Work, dated June 19, 2017

The BWS has reviewed the subject document and offers the following comments. Further, we refer to our previous letter dated March 9, 2017 (Lau, 2017) where additional comments were provided by BWS on Leak Detection. Comments provided in that letter still apply and pertain to this current letter.

We understand that this Scope of Work (SOW) for New Release Detection Alternatives is an "overall outline" for the New Release Detection Alternatives Report (the final report). We look forward to reviewing the Final SOW for New Release Detection Alternatives at the Red Hill Bulk Fuel Storage Facility (RHBFSF) once it is developed and submitted by the Navy to the Environmental Protection Agency (EPA) and the Hawaii Department of Health (DOH).

Main Comments:

The subject SOW outline states that “The Contractor shall execute the requirements of this SOW that will result in the Contractor completing the “New Release Detection Alternatives Report.” However, in various sections it states that the “Authors” will perform or execute work product and prepare report content. It is unclear who (what entity) will be preparing the final report and how precisely the responsibilities for the work will be assigned. Currently the SOW outline may not provide suitable technical depth to ensure that all Contractors bidding on this work have sufficient detailed information to understand what work is required.

Nevertheless, we are pleased to see that many of the suggestions previously provided by the BWS are being considered in this SOW. However, this SOW outline lacks the technical detail that will ultimately be required to evaluate the overall approach and specific goals or acceptance criteria. Statements such as “authors will research and detail...” or “authors shall develop...” as examples do not provide enough technical detail for the BWS to provide constructive comments.

There is likewise limited information in this SOW outline with regards to the previously proposed blind tests to show the effectiveness of the Leak Detection Systems (LDS). Section D of the SOW outline states that the “author shall include a statistical evaluation to demonstrate the developed protocol is acceptable,” but the SOW does not explicitly state the acceptance criteria or requirements for the evaluation (e.g., single-blind testing?). The ultimate goal of the statistical evaluation should not be to demonstrate the protocol is acceptable but rather to establish the reliability with which a low leak rate can be detected over what time period for each leak detection method being evaluated.

The 40 CFR 280 release detection rule for field-constructed tanks does not adequately protect against the unique risks associated with leaks at the RHBFSF (Refer to Section B, Item 1.a.ii.4 of the SOW). This standard is only a “snapshot” of the release taken on the day, or days, of the testing. Such CFR-compliant static leak detection for the RHBFSF storage tanks would not reliably detect leaks of up to 4,300 gallons per tank per year. As stated previously in AOC stakeholder meetings, compliance with this standard is a low hurdle and cannot be considered as a basis for eliminating the potential for current or future environmental contamination at the RHBFSF.

The BWS is concerned about the statement in the Release Detection SOW outline that “[Double Wall [DW] Tank with Interstitial Monitoring] will not be considered further for this evaluation, since this will be discussed after a Tank Upgrade Alternative (TUA) decision is made” (Refer to Section B, Item 2.a.v.2.a.ii of the SOW). One of the significant advantages of double-wall construction with an engineered interstitial space

monitoring system is that it offers a quantum improvement in leak detection and mitigation. The TUA decision would be better informed by an engineering assessment of the leak detection options and implications associated with interstitial monitoring of double-wall tanks, and the results of this study. By not considering an interstitial monitoring system, the Release Detection Alternatives evaluation process will be unnecessarily limited and of very limited use to the TUA decision makers.

Additional Comments:

Refer to Section B, Item 1.a.i of the SOW; the BWS believes that research into the "Existing Industry Practices," should include research into how the 0.5 gallon per hour (GPH) leak rate rule was established for field-constructed tanks, and whether its basis is applicable to the RHBFSF.

Refer to Section B, Item 1.a.5 of the SOW; the BWS concurs that research of industry standards and practices is an important aspect of this work, but would like to re-emphasize the unique aspects and risks associated with the RHBFSF, particularly regarding data from the National Work Group On Leak Detection Evaluations (NWGLDE). The NWGLDE work is primarily focused on Underground Storage Tank (UST) release detection for systems less than 50,000 gallons, which is orders of magnitude below the capacity of that of the RHBFSF storage tanks. Further, the NWGLDE is a volunteer committee with no real authority, and has a mixed level of experience and knowledge. Private sector third party evaluations, listed under Item 1.a.4, may provide more credibility and more useful and applicable input.

Refer to Section B, Item 1.a.iii and 1.a.iv.4 of the SOW; the BWS concurs that the Automated Tank Gauging (ATG) and Automated Fuel Handling Equipment (AFHE) are both inventory control methods. However, they are not viable leak detection systems. Further research into these methods may not provide significant value for this SOW unless it can be demonstrated that these methods can provide a way of limiting the amount of fuel released between annual leak detection testing.

Refer to Section B, Item 1.a.v of the SOW; the BWS does not believe that Environmental Sampling methods are effective methods for dynamic release detection and they are certainly not protective of our drinking water supply. These methods provide useful data for the analysis and impact once a leak occurs, but they are not methods that should be used for the sole prevention and dynamic leak detection. The BWS has stated on multiple occasions that the vadose zone monitoring points are inadequate in number and their construction and location make it nearly impossible to understand fuel migration. We have also shared that the Navy's understanding of fuel migration in the vadose zone is far from what is needed to be able to defensible infer

(let alone estimate) leak rates from changes in vapor concentration measured far underneath the tanks at locations beneath the concrete plug underlying each tank. Allowing Environmental Sampling methods to serve as a leak detection system above our Sole-Source Aquifer is not appropriate or acceptable.

Refer to Section B, Item 1.a.vi of the SOW; the BWS is concerned about the use of the tell-tale system as an effective release detection method. It was decommissioned and is limited because of the age of the system. While part of the SOW, research into the tell-tale monitoring may be useful for understanding the decommissioned tell-tale system, it should not be considered for future alternate leak detection alternatives because, in part, it does not compare to the superior interstitial monitoring methods used for double wall tanks, and further there is evidence that leaks may not find their way to the tell tales as reflected in by Bechtel (Bechtel, 1949). The BWS would like to know why the Navy continues to consider the tell-tale system to be an effective leak detection system for the RHBFSF and worth the time to evaluate further? What specific means and methods will the Navy be using to test and potentially prove its effectiveness?

Refer to Section B, Item 2.a.i.1 of the SOW; there is likely a typo in this line, the phrase "Leak Manger" may likely refer to "Leak Manager."

Refer to Section B, Item 2.a.i of the SOW; as previously stated, static leak detection is ineffective and should not be considered for the future alternate leak detection system at the RHBFSF. While as part of the SOW, research into static leak detection may be useful for understanding the methods, it should not be considered for future leak detection systems because, in part, it is ineffective and can allow for substantial releases to occur.

Refer to Section B, Item 2.a.ii of the SOW; the BWS believes that only Double Wall Tank Interstitial Monitoring system should be considered. Tracer, Vapor, Groundwater (GW) Monitoring, and tell-tale systems are not effective prevention based methods. Research into these methods may provide useful information and demonstrate the superiority of the Double Wall Interstitial Monitoring system. However, these other methods should not be considered for future alternate leak detection systems. Double Wall Interstitial Monitoring is the only leak prevention based release detection method.

Refer to Section B, Item 2.a.iii of the SOW; the BWS believes that current industry standard is Double Wall Interstitial Monitoring. Systems used on Bulk Fuel Field Constructed Underground Storage Tanks (BFCUST)s are not viable options because these systems were previously deferred and not regulated. Only BFCUST owners concerned about risk management performed voluntary release detection.

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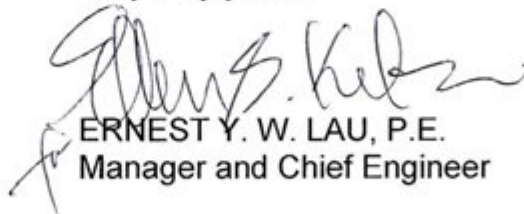
Refer to Section B, Item 2.a.iv of the SOW; the BWS believes that there is an engineering solution to the limitations and challenges for construction/operation at the RHBFSF. The RHBFSF was built in 1941 and was considered state-of-the-art at that time. However, after approximately 75 years of operation, today's engineering and materials advances, robotic manufacturing technologies, and other factors can be expected to achieve better results, more reliable welding, and manufacturability than what was available for the original construction. Further, and again, the BWS notes that the NWGLDE data may not be applicable to the RHBFSF (see above).

Refer to Section B, Item 3.c.ii of the SOW; the BWS believes that the Vista Precision Solutions LRDP technology has been used extensively in the commercial aviation industry and with Department of Defense (DOD) sites with Aboveground Storage Tank (AST) piping systems. It is our understanding that it works well for its intended purpose, but will have the same limitations as the Mass Tech system's inability to detect small leaks at the RHBFSF.

Refer to Section B, Item 5 of the SOW; the BWS believes that any Decision Matrix that does not include Interstitial Monitoring has an inherent bias and is of limited value. Interstitial Monitoring should be considered as part of this SOW and evaluation of New Release Detection Alternatives.

If you have any questions, please call Erwin Kawata at 808-748-5080.

Very truly yours,



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References Cited

Bechtel Corporation (Bechtel). 1949. Engineering Survey of U.S. Navy Petroleum Facility at Pearl Harbor. Prepared by the Bechtel Corporation, Contract No. 16535. May 12.

Lau, E. Y. W. (2017). Letter to Mr. Bob Pallarino, United States Environmental Protection Agency (EPA) and Mr. Steven Y.K. Chang, State of Hawaii, Department of Health regarding: Board of Water Supply (BWS) Comments Pertaining to the Environmental Protection Agency (EPA) and Hawaii Department of Health (DOH) February 15, 2017 Administrative Order on Consent (AOC) Sections 2, 3, 4, 5 and 8 Meeting, March 9, 2017.