

## BOARD OF WATER SUPPLY

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September 30, 2016

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and

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Dear Messrs. Pallarino and Chang:

Subject: Board of Water Supply (BWS) Comments to the Work Plans  
Being Developed Under the Red Hill Bulk Fuel Storage Facility  
Administrative Order on Consent (AOC) Statement of Work (SOW)  
Section 3, Tank Upgrade Alternatives

The BWS and its consultants have reviewed the SOW Section 3: Tank Upgrade Alternatives (TUA) outline dated September 8, 2016 prepared by the Navy and Defense Logistics Agency (DLA) and offer the following comments and recommendations.

The SOW outline dated September 8, 2016 continues to omit details regarding the scope and purpose of the TUA section, including certain TUAs (e.g., relocating the tanks), and the approach for comparing the alternatives, among others.

Given the amount of time that has elapsed since the prior SOW document was made available to the public (on January 29, 2016), the September 8 document contains only a few changes as listed below.

- A new placeholder has been added for Section 1.9 "Pilot Programs"
- In Section 3.7, the word "constructible" has been replaced with the word "feasible" as a critical screening criteria definition

- Several notes (e.g., “added by EPA”) have been removed from Table 5-1
- The definitions of Attributes 31 and 46 in Table 5-1 have been slightly expanded
- An additional Attribute 48, “Consistency with Local Policies and Resolution,” has been added to Table 5-1
- An additional sentence reading “General Description to include a discussion of 1) NOT filling the interstitial space with grout, 2) installation of a Cathodic protection system and 3) application of the design at other tank systems” has been added to Section 5.3.4.1
- In Table 5-2.2A, Attribute 5, the word “constructible” has been replaced with the word “feasible”
- An additional Attribute 48, “Consistency with Local Policies and Resolution,” has been added to Table 5-2.2A
- An additional sentence reading “General Description to include a discussion of 1) NOT filling the interstitial space with grout and [sic] 2) installation of a Cathodic protection system and 3) application of the design at other tank systems” has been added to Section 5.3.5.1

The TUA outline continues to ignore comments and recommendations made in our May 27, 2016 letter, which is restated below.

### **BWS Comments on Section 3 Regarding Tank Upgrade Alternatives (TUA)**

The draft section currently does not have any write up (other than the outline of the Executive Summary) regarding the scope, purpose, and limitations of this section. Based on recently held AOC discussions between BWS and the Parties, it is BWS’s understanding that Section 3 is supposed to provide a set of tank upgrade alternatives along with various screening criteria that can be used to evaluate each of the alternatives against each other. This section contains information about the current tank configuration and historic structural integrity issues with the tanks. It then discusses the many available technology and techniques for upgrading and/or restoring the tanks, as well as some advantages and disadvantages of the various options. BWS has identified the following data gaps and has provided our recommendations on how to address these data gaps.

#### **No details for scope and purpose of the TUA section.**

The current TUA draft does not clearly describe what this section is supposed to accomplish.

Recommendations:

TUA Recommendation 1: The outline does not contain an introduction section, which is needed. The introduction section should include background, purpose and scope subsections that clearly define the goals and limitations of this section.

TUA Recommendation 2: The outline does not discuss the limitation that was expressed by EEI (Enterprise Engineering Incorporated, the Navy's contractor for this section) in a recent meeting that this section does not provide the guidelines by which each of the alternatives will be evaluated. A clear description of this limitation should be provided in the scope and purpose, and it should re-direct the reader to the section of the AOC work plans that will describe the selection process. BWS suggests an appropriate section describing and outlining the selection process between the various tank upgrade alternatives is Section 8 of the report that covers the risk and vulnerability assessment. The reason for this suggestion is the risk and vulnerability assessment has the longest lead time, and each of the tank upgrade alternatives should be compared and weighed against each other on the basis of risk to the environment.

**Obvious tank upgrade alternatives are missing from this section.**

The TUA section outline does not include or consider tank relocation as an upgrade alternative.

Recommendations:

TUA Recommendation 3: Add tank relocation as a tank upgrade alternative to be considered as part of the cost-benefit and risk/vulnerability analysis. Closure of the Red Hill Fuel Storage Facility and relocation of the tanks to another location such as properties available on Joint Base Pearl Harbor-Hickam that are not directly over a drinking water quality groundwater aquifer should be considered as an option for comparison along with other tanks repair and re-design options. This option, although expensive and potentially difficult for the Navy to implement, is one of the best options from BWS's viewpoint, as it has the greatest ability to reduce the risk of future leaks into the water supply. By not considering relocation as a viable option, BWS's preferred option is not even compared and contrasted to rank among the other options.

**The process by which the various tank alternatives will be compared against each other is not described.**

The process that will be used by the Stakeholders to evaluate and rank the various tank upgrade alternatives is not clearly described. A description of this process is necessary to allow each Stakeholder to have input to the selection process and to provide transparency on how the selection process will be conducted.

Recommendations:

TUA Recommendation 4: The report should clearly state which section should describe how the tank upgrade selection process will be conducted. Possibilities include this

section (but as previously discussed, EEI did not think it fit in this section), Section 8 covering risk, or a new report section. The report should describe how the tanks alternatives will be evaluated, and how each Stakeholder's weighting of every characteristic for each alternative will be taken in to account.

TUA Recommendation 5: As stated in our previous letter dated May 27, 2016, the BWS recommends using a cost-benefit analysis to determine the best ALARP (as low as reasonably practicable) risk solution. This could be part of the risk analysis (Section 8). At the same time, in view of these comments and of our ongoing concerns, the BWS maintains our position of a zero risk tolerance for a release to the environment.

**Streamline the number of characteristics and attributes by which each tank alternative will be evaluated.**

The current document lists several attributes with a ranking system applied to each attribute (Table 5-1). There are 47 attributes listed, and in many cases the table column for ranking the importance of the attribute of each system is blank. Having such a large number of attributes with which to evaluate each alternative will make the evaluation process quite difficult, potentially leading to a ranking with no clear winner.

TUA Recommendation 6: Consider combining some of the attributes into one attribute or characteristic. Such modifications to the current evaluation/scoring matrix may help with simplification of the weighting process for each of the characteristics/attributes. As currently structured, BWS is concerned that the weightings for increases in reliability and leak detection associated with secondary containment systems (vs. single wall alternatives) may be too low given all the other attributes listed.

**There is limited information currently available about specific proposed alternatives; additional information regarding the details for these alternatives is needed in this section.**

The current draft of TUA Section 5.3 is missing large amounts of information for each of the specific proposed alternatives. This information must be provided in order to accurately assess and rank the alternatives.

TUA Recommendation 7: Specify whether a composite system (such as proposed Alternative 2B) has been shown to work on other tanks or similar tank systems.

TUA Recommendation 8: Explain if it is possible to slightly redesign Alternative 2A or 2B, such that it would not be necessary to fill the interstitial space with grout (as grout filling will make leak detection more difficult).

TUA Recommendation 9: If Alternatives 2A or 2B are selected with grout filling of the interstitial spaces, this design should consider the additional alternative that cathodic protection is built into the design.

**Evaluation and screening of candidate technologies needs better clarity and definition.**

There is no side by side comparison of the technologies selected. A candid evaluation is needed of the whole question of single-wall systems versus double-wall systems. Again, most of the sections is blank or incomplete. The single-wall tank interior upgrade is the only candidate that had a written evaluation. The narrative for all of the other 28 candidates on the following eight pages was blank or incomplete.

The screening criteria categories (Feasible, Testable, Inspectable, and Repairable) as well as the comments have some subjective biases. For example, the Tankbau technology was evaluated as “Unknown” in the feasible category, and “Limited” in the testable and repairable categories. This technology has been and is used extensively in Europe at military cut-and-cover facilities for over 40 years without a release. Its final position in the selection process does not merit the adjectives provided in the Table 3-1 matrix. Although it was selected for further investigation, the biases in the table will not enhance its potential for selection. The Tankbau technology is just one example. There are others in the matrix as well that the BWS would like to have input on in the screening and further investigation processes.

The secondary screening methodologies evaluation criteria categories are Practicability, Suitability, Constructible and Desirability. Table 4-1 contains the evaluation results using these categories and provides a discussion summary. Again, there are some professional biases and subjectivity present in Table 4-1 that should be discussed and reconsidered.

**The TUA outline dated September 8, 2016 also needs revisions that address the following areas of concern.**

Three of the Alternative 1 Options – Single-wall Existing Tank Upgrades (1A, 1B, and 1D) were “deemed worthy of further consideration” and 1A even considers the potential for a tell-tale system that had been previously (and unsuccessfully) used. Items 1C and 1E were not considered worthy.

The BWS has no confidence in any single-wall storage alternative. There are no best available practicable technologies that are single-wall that provide reliable thresholds of detection, particularly for 75-year-old steel and concrete Underground Storage Tanks (UST) systems that are located 100 feet over the aquifer. Only Prevention technologies should be considered.

There is inadequate consideration for the potential for installation, delamination, and application problems that usually go along with external and internal coatings. There was also no mention about the preferred release detection method that would be used for the single-wall system. The release detection method is a critical part of the

alternative selection process. In addition, the BWS has no confidence in old or new tell-tale systems as an internal release detection method for the tanks at Red Hill.

The BWS strongly believes that none of the Alternative 1 concepts are worthy of consideration. Using that alternative would lead to a repeat of the existing situation which is unacceptable.

Alternatives 2A through 7 are all options with secondary containment, and are superior to any of the Alternative 1 options. Here, there are several points of concern that need to be considered. These include the similar issues about the potential for installation, delamination, and application problems that go along with external and internal coatings, and the preferred release detection method that would be used for each of these double-wall systems. As with single-wall systems, the release detection method is a critical part of the alternative selection process. There are five ways to perform interstitial monitoring – visual, vacuum, pressure, hydro-static, and sensors, and knowing which method will be used is critical in the design and installation of the system.

The BWS does not have confidence in Alternative 7 as a worthy option, and because of mixed performance records with synthetic liners in the storage tank industry.

Step 3, Section 5 – Assessment of Best Available Practicable Technological (BAPT) Upgrade Alternatives lists six technologies that were selected in the screening process – Single-Wall Alternatives 1A, 1B, and 1D, and Secondary-Containment Alternatives 2A, 2B, and 3A. However, only Alternatives 1A and 2A received any written narrative in the TUA. The other four alternatives were mentioned, but not evaluated. Table 5-1 lists the Attribute (positive and negative), Definition (a summary), and Ranking System classification (just the criteria, not the values) attributed to the alternatives considered. Forty-eight attributes were considered in Table 5-1. As with the previous matrices, there are some biases and subjectivities in the attributed values that are reflected in the table. These specific subjectivities are not discussed within these comments, but it is recommended that BWS representatives be invited as non-voting ad-hoc attendees to any AOC attribute and ranking meetings, or that a separate meeting be set up to discuss each of the 48 attribute evaluations for the selected alternatives.

Table 5-1 has nine pages of narrative and evaluation for Alternative 1A, and just one page of general information (no table) for Alternatives 1B and 1D. The BWS believes that these restorative alternatives only delay the inevitable release that will occur with a single-wall upgrade technology. The same arguments that have been previously made about the inadequacy of single-wall release detection technologies, problems with coatings, and lack of release prevention apply to this section of the TUA.

Seventeen pages of the table, along with drawings and explanations are dedicated to Alternative 2A. There is just one page each for Alternatives 2B and 3A. As with Alternative 1A, the same justifications for a preventative solution with reliable interstitial

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release detection apply. The BWS is committed to an Alternative that prevents a future release, and single-wall technologies do not provide that level of protection.

A comment was made in the Alternative 1A narrative about compatibility with the current release detection system. The BWS believes that this compatibility with the current release detection system is irrelevant. The existing release detection is completely inadequate to provide the protection to Honolulu's groundwater resources. The BWS would like to see the installation of an improved system during the upgrade construction process until a more reliable interstitial system can be installed.

If you have any questions, please feel free to contact me at 808-748-5061.

Very truly yours,

A handwritten signature in blue ink, appearing to read "Ernest Y. W. Lau".

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