Enclosure (2) to
Red Hill Bulk Fuel Storage Facility, Oahu, Hawaii
28 September 2022 Supplement 1.B

DOH Superseding Emergency Order
Status and Ongoing Progress

Enclosure 2
DOH Superseding Emergency Order - Status and Ongoing Progress (as of September 28, 2022)

DoD's progress in addressing the seven elements established in the DOH superseding EO, Directive 4 is as follows:

a. ***A detailed description of the information reviewed and gathered, with appropriate references.***

As part of the initial defueling plan on June 30, 2022, DoD provided an annotated bibliography listing all information gathered and reviewed as part of the initial Simpson Gumpertz & Heger (SGH) third-party assessment.

Since the initial submittal, additional assessments have been completed, and DoD has provided those assessments—along with DoD's evaluation of those assessments—to DOH. Specifically, on September 7, 2022, DoD provided the FY 2022 NDAA Section 318 Pipeline Assessment, and DoD has included with this supplement its initial evaluation of the Section 318 Assessment.

Two additional items will also inform DoD's defuel plan, and DoD will provide DOH those items, as well as DoD's evaluation of those items:

- DoD Underground Pump House to Hotel Pier pipeline assessment (complete: September 30, 2022); and
- Additional evaluations recommended by the SGH third-party assessment (complete: September 30, 2022).

b. ***The specific procedures to defuel the 20 Tanks, four surge tanks, and associated pipelines, including, but not limited to, the sequence in which the tanks are planned to be emptied, the proposed process, and a general description of the fuel-transfer destination (e.g., pier, above-ground storage tank, etc.). A description of the infrastructure and procedures needed to perform the work and ensure pipeline integrity (i.e., identify the specific pipelines, receiving surge tanks and storage tanks, tanker vessel, truck loading racks, pier, etc.*).**

An updated description of procedures to defuel the tanks is outlined in the Phase 5 updates in Supplements 1.A and 1.B. Specific detailed procedures for defueling each tank will be provided to DOH and EPA for their concurrence and final approval prior to defueling. Additionally, DoD's Unpacking plan, included with the September 7, 2022, Supplement 1.A provides details on process and sequencing of unpacking. DoD will submit defueling CONOPs, OPORDs, Baselines and HAZOP analyses for EPA/DOH concurrence prior to defueling. These operational documents will provide additional information on defueling process, sequence, and safety protocols.

Specific details on DoD's progress in completing of the SGH-recommended infrastructure repairs, including information on "the infrastructure and procedures needed to perform the work and ensure pipeline integrity" is provided in Enclosure (4) to this supplement. The Section 318 Assessment, provided to DOH with the September 7 Supplement 1.A., and DoD's

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initial evaluation of the Section 318 Assessment, provided with this supplement as Enclosure 3, provide additional information on infrastructure work to ensure pipeline integrity. Upon the completion of all assessments and DoD's evaluation of those assessments, DoD will provide a final list of repairs for defueling to DOH for its concurrence. DoD expects to provide this list by the end of October 2022.

c. ***A detailed description of assessment work performed (e.g., the hazard and operability study and risk assessment, field work with data provided), evaluations performed (e.g., tank and pipeline analysis), and the design standards utilized to determine infrastructure integrity (including, but not limited to, piping, associated valves, piping connections, and pumps) to perform the work outlined in the Defueling phase of the Closure Plan.***

Detailed description of the hazard and operability study in the SGH report: RiskTec, a sub-consultant for SGH for the independent third-party assessment, conducted an Operational Readiness Assessment (ORA) and Hazard and Operability Analysis (HAZOP) to identify facility systems integrity risks that may impact the environment and corrective actions to address any deficiencies. In making recommendations to minimize the risk of significant releases, RiskTec took into consideration the Red Hill Bulk Fuel Storage Facility's (RHBFSF) proximity to the underlying aquifer.

Risktec's assessment was conducted on site. RiskTec's methodology included completing the Occupational Health and Safety Administration (OSHA) Process Safety Management (PSM)[1] of Highly Hazardous Chemicals (29 CFR 1910.119) Audit Checklist (OSHA, 1992) and the Environmental Protection Agency (EPA) Spill Prevention Countermeasures and Controls (SPCC,40 CFR 112) Field Inspection and Plan Review Checklist. These checklists are used by OSHA, EPA, and facilities to audit their PSM and SPCC programs against regulations and best practices. The Operational Readiness Assessment is discussed further below.

RiskTec also performed a HAZOP to assess the operational risks associated with both defueling RHBFSF and ongoing operations at Joint Base Pearl Harbor Hickam (JBPHH). The HAZOP is a baseline operational risk assessment for the facility and can be used to manage operational risks within a management system for continual improvement.

The HAZOP report documents a Process Hazard Analysis (PHA) for JBPHH and RHBFSF for Naval Supply Systems Command Fleet Logistics Center Pearl Harbor (FLCPH). The review

[1] PSM and SPCC are two U.S. regulatory programs commonly in place at large marine petrochemical terminals. Regardless of regulatory applicability, these programs represent good industry practices and are also applied outside the United States through Risk-Based Process Safety (RBPS) programs and strong spill management and containment programs.

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was conducted using the HAZOP and "What-If" methodologies. The methodologies employed in this study meet the requirements of the OSHA rule, Process Safety Management of Highly Hazardous Chemicals (29 CFR 1910.119) (OSHA, 1992), and EPA's rule 40 CFR Part 68, Accidental Release Prevention Requirements, Risk Management Program Under the Clean Air Act, Section 112(r)(7) (EPA, 1994).

The PHA was conducted in person from February 7, 2022 through February 11, 2022, and February 21, 2022, through February 25, 2022. The PHA Team met for a total of ten days. The PHA was facilitated and documented by RiskTec with key participation from FLCPH personnel and support personnel. The multidisciplinary team identified process hazards associated with the JBPHH fuel distribution system and the RHBFSF. The team focused on those process hazards that could lead to a significant impact on mission readiness, safety or health, public, and/or the environment during routine and non-routine operations. The PHA team identified 120 recommendations for reducing the likelihood and/or severity of potential consequences associated with the JBPHH fuel distribution system and the RHBFSF. The HAZOP report was created by RiskTec, with input from Navy personnel who participated in the HAZOP.

RiskTec also reviewed operational practices to assess the state of ongoing operations at RHBFSF and JBPHH. Facility systems integrity was evaluated to determine potential impacts on the environment, personnel health and safety, the public, and mission readiness. Assessments were conducted for defueling RHBFSF and ongoing operations at JBPHH and RHBFSF.

Structural integrity is defined as the ability of a structure or equipment to perform its required function effectively over a defined period while protecting health, safety, and the environment. It is an ongoing process throughout the lifecycle of the Facility. Structural integrity management (SIM) ensures that the systems and operational procedures that deliver integrity are in place and will perform when required. The RiskTec team performed the following activities, as needed, to put some of the HAZOP decisions into practice and develop effective actions to mitigate potential future incidents:

- Information Management. Collect and review relevant maintenance and operational history. This review also included design documents, inspection reports, and previous assessments to understand the current state of the facility and its potential vulnerabilities.
- SIM Program Evaluation. Review Facility SIM system to identify potential gaps in the inspection program and structural evaluations.
- Structural Evaluation. Review the current condition of the structures and equipment compared to prior assessments and changes in parameters that may affect integrity and risk levels. Identify analysis, repair, and maintenance requirements for structures and components to meet the acceptance criteria for structural integrity.
- Repair. Develop repair schemes to proactively improve the condition of safety-critical elements, including equipment and structures, based on the structural evaluation.

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Based on the inspections and document reviews, risks were evaluated in light of data and repairs prioritized to mitigate potential future failures. This integrity management study is expected to enable DoD to make better-informed decisions. Additionally, it helps stakeholders to better understand the facility-wide conditions. Piping, tanks, and structures were grouped based on similarities in design and defects.

The load cases for civil and structural elements, including dead, live, and operating loads, are based on ASCE 7 and other structural design codes. For pipelines, ASME B31.3 and B31.4 were used. API 650 and 653 are used for an assessment of storage tanks.

Hand calculations and finite element (FE) analyses were completed, as necessary, to check the response of structural elements for normal and abnormal loads. Static and dynamic (response spectrum) analyses were performed. SAP2000 and TRIFLEX software packages were used to complete structural and piping analyses respectively. The ABAQUS software package was used for nonlinear capacity analysis of the failed Dresser couplings. Also, the underground storage tank was modeled using ABAQUS software to check the response against internal and external pressures. ABAQUS is a general-purpose, nonlinear finite element analysis method software developed by Dassault Systems. ABAQUS is widely used to perform complex civil, structural, and mechanical systems analyses in critical applications, including the aerospace and nuclear industries.

Capacities of reinforced concrete and structural steel elements were determined using ACI 318 and AISC 360 respectively. Demand-to-capacity ratios (DCRs) were checked for the elements to determine strengthening requirements.

The integrity of degrading pipe sections was evaluated using API 579. API 579 is widely used to determine a component's fitness-for-service (FFS). FFS assessments are quantitative engineering evaluations performed to demonstrate the structural integrity of an in-service component that may contain a flaw or damage, or that may be operating under a specific condition that might cause a failure. This standard provides guidance for conducting FFS assessments using methodologies specifically prepared for pressurized equipment. The FFS assessment involves the following steps:

- Flaw and Damage Mechanism Identification. Identify the flaw type and cause of damage based on the original design and fabrication practices, the material of construction, and the service history and environmental conditions.
- Data Requirements. Determine FFS analysis inputs from the original component design data, maintenance and operational history, expected future service, flaw size, state of stress in the component at the location of the flaw, and material properties.
- Select Assessment Techniques and Acceptance Criteria: Based on the damage mechanism, select the most suitable options.

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These assessments allowed the team to make run-repair-replace decisions to help determine if components containing flaws identified by inspection can continue to operate safely for some time and when they need to be repaired to mitigate failures. This type of FFS assessment is recognized and referenced by the API codes and standards, including API Recommended Practices (RPs) 510, 570, and 653, as suitable means for evaluating the structural integrity of pressure vessels, piping systems, and storage tanks where inspection has revealed degradation and flaws in the equipment. The FFS assessment procedures in API 579 cover the present integrity of the component given the current condition.

The conditions observed include general and localized corrosion, widespread and localized pitting, laminations, dents, and gouges, and coating failures.

The DoD's technical expert, NAVFAC EXWC, used API 570 and API 653 and other engineering standards to verify the third-party assessment recommendations. The DoD is consulting with SGH, the author of the independent third-party assessment, on repairs or improvements of long duration that impact the overall defueling schedule to determine if there are alternative means of mitigating risks rather than completing those repairs. The DoD will seek concurrence from DOH and EPA for all proposed revisions to the repair plan.

DoD's initial evaluation of the Section 318 Assessment, attached as Enclosure (3) to Supplement 1.B, includes initial discussion of the assessment work in that study, including design standards utilized in assessing pipeline integrity. DoD will provide additional details on those standards as it continues its review of the Section 318 Assessment.

The Underground Pump House to Hotel Pier pipeline assessment will be completed the end of September. DoD will provide details on standards used in that assessment, upon its receipt and review of that assessment.

d. ***A description of the Assessment Report's findings and recommendations on correcting deficiencies or areas that require repair or changes to ensure safe defueling, and the basis for those findings and recommendations. Necessary repairs to all regulated UST facility pipelines must comply with HAR §11-280.1-33(a) (5) and must be completed prior to defueling (with associated records per HAR §11-280.1-33(b) submitted to the Department*****).***

Supplement 1.A, Part I.C, communicates DoD's intent for all SGH operational and infrastructure recommendations. The FY 2022 NDAA Section 318 Pipeline Assessment and the EPA Red Hill FRP/SPCC inspection report were also provided in supplement 1.A.

This Supplement 1.B., Part I.A.2, provides a summary of the findings from the FY 2022 NDAA Section 318 Pipeline Assessment report. DoD also has provided its initial evaluation of the Section 318 Assessment as Enclosure (3) to Supplement 1.B.

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DoD expects that the Underground Pump House to Hotel Pier Pipeline Assessment will be complete in fall of 2022. DoD will provide a copy of that pipeline assessment to DOH and EPA once available.

Following the completion of all pipeline assessments, DoD will provide a consolidated repair list for DOH concurrence. DoD expects to provide this list by the end of October 2022.

As part of its QA/QC review protocol, DoD will ensure that repairs to all regulated UST facility pipelines will comply with HAR §11-280.1-33, and DoD will meet all regulatory requirements for document submission to DOH.

e. ***An explanation of how the Assessment Report's recommendations will be incorporated and what quality assurance and quality control steps will be adopted or implemented to ensure that any and all necessary repairs will be performed in accordance with the recommendations and industry best practices prior to defueling*****.***

DoD's September 7, 2022 Supplement 1.A provides "an explanation of how the [SGH] Report's recommendations will be incorporated." (*See* Supplement 1.A., Part I.C) DoD has provided in this Supplement 1.B a discussion of how it plans to incorporate the findings of the recent Section 318 Assessment, and Enclosure (3) to this supplement is DoD's initial evaluation of the Section 318 Assessment.

DoD anticipates receiving another list of recommended repairs and enhancements from the Underground Pump House to Hotel Pier Pipeline Assessment by the end of September. DoD will evaluate those repairs and enhancements and add any intended recommendations to the consolidated list of intended repairs and enhancements that will be provided to DOH and EPA by the end of October.

DoD is including continuous QA/QC oversight throughout Phase 3 of the Defueling Plan as repairs are completed. DoD has established a team of petroleum, oil, and lubricants construction experts solely focused on providing QA oversight to the repairs and enhancements of the RHBFSF in support of defueling. Additionally, DoD intends to award a contract to provide independent QA oversight. DoD will provide further details of the third-party quality assurance plan for repairs to DOH. This submittal (UID 362) is currently scheduled to be delivered to DOH no later than November 1, 2022. In Phase 4, DoD will provide EPA and DOH a list of completed repairs and enhancements for concurrence prior to defueling. This will include results of the QA/QC inspection and assessment data completed during Phase 3.

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f. ***Plans for oil spill/release prevention, containment, and response/contingency plans, including the deployment of resources sufficient to adequately respond to and clean up any releases that occur during the defueling process.***

DoD provided draft updated FRP/ICP/SPCC plans, as well as a draft spill exercise plan for unpacking with its September 7, 2022 Supplement 1.A. DoD also included in Supplement 1.A a summary of additional training, safety, and spill mitigation improvements. (See Supplement 1.A., Part 1.D). DoD conducted a spill drill exercise on September 22, 2022 (prior to unpacking).

The final spill drill exercise prior to defueling will be conducted under a Unified Command Structure in coordination with DOH, EPA, and U.S. Coast Guard. The exercise will include field deployment of equipment, assets, and integration of supporting Oil Spill Response Organizations (OSROs).

g. ***Prioritization and proposed implementation schedule, including detailed critical path, for necessary repairs and defueling. It is essential that the implementation schedule achieve the defueling of the Red Hill Facility at the earliest date consistent with the safe defueling of the Facility and the protection of public health and the environment. If Respondent certifies to the Department that defueling of the Bulk Fuel Storage Tanks at the Red Hill Facility cannot safely be achieved within 30 calendar days in a manner that protects public health and the environment, defueling of the Bulk Fuel Storage Tanks at the Facility must nevertheless be completed at the earliest date consistent with safe defueling and the protection of public health and the environment. This is necessary to address the ongoing and imminent peril to human health and safety and the environment posed by the Red Hill Facility, and the implementation schedule set forth in the Defueling Phase of the Closure Plan must reflect this requirement.***

Enclosure (1) of supplement 1.B is the current schedule for transferring all fuel from the RHBFSF. It spans all five phases of the defueling plan. This plan shows all fuel will be removed from the RHBFSF by June 2024. DoD continues to seek efficiencies to further reduce the timeline and will work with DOH to identify and decide upon any efficiencies.

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