

Navy Closure Task Force – Red Hill

Revised Tank Cleaning Verification Plan

July 26, 2024



Section 1. Introduction

The Navy Closure Task Force – Red Hill (NCTF-RH) is submitting this revised Tank Cleaning Verification Plan, updated from the version previously submitted on June 13, 2024. This version incorporates all the additional comments from both the Hawaii Department of Health (DOH) and U.S. Environmental Protection Agency (EPA). The comments were discussed in detail and received initial approval from DOH and EPA during the in-person meeting held at DOH on July 12, 2024.

NCTF-RH submitted its initial Tank Cleaning Verification Plan on January 10, 2024 and received comments from DOH on February 8, 2024. NCTF-RH submitted its Tank Closure Plan, Supplement 2, on February 28, 2024. On April 12, 2024, NCTF-RH submitted a revised Tank Cleaning Verification Plan based on findings from in-depth Navy research and in-person meetings held with both DOH and EPA on March 20, 2024. NCTF-RH received formal comments from DOH and EPA on May 8, 2024 and May 9, 2024, respectively, and provided a revised plan incorporating the responses to these comments on June 13, 2024.

As suggested by the EPA and DOH in their letters to NCTF-RH dated May 8, 2024, and May 9, 2024, NCTF-RH is proposing to adopt the definition of “clean” from the Society for Protective Coatings (SSPC) Surface Preparation Standard No. 1 – Solvent Cleaning (SP-1). This definition is aligned with the definition previously adopted from API 2015 which is “the removal of all products, vapor, sludge, and residue from a tank, and washing, rinsing, and drying a tank so that no product or residue remains on any tank surfaces (shell, bottom, piping, appurtenances).” However, NCTF-RH is proposing to use the definition found in SP-1 to be consistent with the use of the rest of SP-1. It should also be noted that the processes used to clean, rinse and inspect each tank also apply to all components within the tank to the maximum extent practicable. In the event that areas of a tank cannot be accessed for visual inspection, NCTF-RH will inspect using photographs or video inspection.

Since neither DOH nor EPA have prescribed tank cleaning standards, NCTF-RH is proposing to augment the visual inspection by utilizing an additional verification method found in SP-1. A third-party quality verification (QV) inspector with industry-recognized certification from the Association for Materials Protection and Performance (AMPP), formerly the National Association of Corrosion Engineers (NACE), will conduct the wipe test (hereinafter referred to as the “cloth rub test”) described in paragraph 6.1.1 of SP-1 to further demonstrate sufficient cleanliness of tank interior surfaces, protection of the aquifer, and support closure-in-place of Red Hill Bulk Fuel Storage Facility’s (RHBFSF) 14 underground fuel storage tanks (Tank Nos. 2 through 12, 15, 16 and 20), 4 surge tanks, main sump and Zone 7 sump. Photographs from each

tank will provide historical documented evidence that the interior of each tank is cleaned in accordance with the standards contained in SP-1. These photographs will include both interior surfaces of each tank and photos of the results of the cloth rub tests.

NCTF-RH is implementing multiple layers of quality oversight and review that include cleaning contractor quality control (QC), NCTF-RH quality assurance (QA), third-party quality verification (QV), and regulatory inspection from DOH and EPA. NCTF-RH is confident that the multiple layers of quality oversight will provide transparency and ensure a consensus amongst all parties that the tanks are sufficiently cleaned to effectively eliminate further risk to human health and the environment.

NCTF-RH intends to comply with the following prescribed cleaning standards when cleaning the tanks:

1. Society for Protective Coatings (SSPC): Surface Preparation Standard No. 1 – Solvent Cleaning
2. American Petroleum Institute Publication 2015 “Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks”
3. American Petroleum Institute Publication (API) RP 1604 “Closure of Underground Petroleum Storage Tanks”
4. United Facilities Guide Specifications (UFGS) 33 0150.55 “Cleaning of Petroleum Storage Tanks”
5. National Fire Protection Association (NFPA) 326, “Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair”

In the event that there is conflict between the standards, NCTF-RH intends to comply with the standards in the order shown above.

A separate Tank Validation Plan will be drafted for the six (6) tanks that are currently out of service. NCTF-RH will submit this plan to DOH and EPA at a later date, to be determined.

Section 1.1. Historical Evolution of the Tank Cleaning Verification Plan

The Navy has proposed various methods in the previous submissions for tank cleaning verification. In late 2023, the Navy began exploring the use of ultra-violet (UV) light to detect the presence of fuel on the interior surfaces of Red Hill underground storage tanks. The Navy had also previously considered a method that analyzes the effluent rinsate from the tank. Most recently, the NCTF-RH proposed using a Total Petroleum Hydrocarbon Diesel Range Organics (TPH-DRO) Wipe Test. However, the Navy eventually concluded all of these methods were ineffective for the following reasons:

1. UV: When exposed to UV light, JP-5 could only be detected using a UV-bandpass camera, making it impractical to use in the field. JP-5 could not be observed within the visible light spectrum (i.e. using only the naked eye).
2. UV: The intent of using the UV light process was to confirm any remaining fuel on the interior surface of the tank was less than 1 mil in thickness. However, the thickness threshold for using UV light generally only worked for a thickness of 5 mils or greater.
3. Rinsate: The NCTF-RH elected not to pursue rinsate sampling due to the inability to pinpoint locations inside each tank that required further cleaning. If a rinsate sample from the tank sample line did exceed the EALs, it is not possible to pinpoint the area that must be cleaned again. Thus, requiring the entire tank to be cleaned again.
4. TPH-DRO Wipe Test: This method was dismissed due to concerns by both EPA and Navy regarding the lack of field testing and applicability for use at the RHBFSF.

NCTF-RH submits this revised plan with the intent of obtaining DOH and EPA concurrence with the following approach.

Section 2: Tank Cleaning Quality Verification Tiers

The comprehensive approach to verify tank cleanliness at the RHBFSF is delineated into four independent, yet interconnected tiers. Each tier serves a specific function in the tank cleaning verification process, ensuring that the tank cleaning meets stringent standards of safety and environmental protection. These tiers represent a collaborative, multilayered effort between various entities, each with a defined role in the tank cleaning verification plan.

Tier 1: Quality Control (QC) by the Tank Cleaning Contractor

The initial tier of verification is undertaken by the tank cleaning contractor responsible for the Quality Control (QC) over its cleaning operations. The cleaning contractor's QC team continuously monitors and verifies that all cleaning procedures are effectively removing product, sludge, and residue from the interior surfaces of the tanks by visual methods outlined in SP-1. The QC process includes comprehensive checks and balances to ensure that each cleaning step is executed to the highest standards and is thoroughly documented for subsequent review. Specific data for inclusion of the QC documentation process may include records of cleaning solution used and relative percentages in detergent rinse (i.e. 3% Simple Green), water use rates, dates of cleaning, rinsing and QA inspections in each section or vertical transect of the tank, and volume of flow into Tank S311. The tank cleaning contractor will also informally (i.e. not documented) use the water break test as a guide to assist in confirming the tanks are cleaned in accordance with SP-1, the proposed standard.

Tier 2: Quality Assurance (QA) by NCTF-RH Construction Manager or Engineering Technician

NCTF-RH provides the second tier of verification through its Quality Assurance (QA) program. NCTF-RH QA team inspects the work completed by the cleaning contractor, using visual inspection to confirm each tank is devoid of product, sludge, and residue. The QA program is independently audited by NCTF-RH Quality Validation Inspectors.

Tier 3: Quality Validation (QV) by Third-Party Certified Inspector

The third tier involves obtaining the services of a third-party certified inspector to perform Quality Validation (QV) of the tank cleaning. The field inspector will be required to hold a Certified Coatings Inspector Certification (CIP Level 2). The final QV report will be signed by an inspector that holds a Senior Qualified Coatings Inspector Certification (CIP Level 3). NCTF-RH will provide documentation demonstrating the qualifications of the CIP Level 2 and CIP Level 3 inspectors once these individuals have been identified. These inspectors will review and validate the cumulated document and data collected from all utilized methods such as visual inspection, cloth rub testing, and any additional necessary assessments. The QV reporting process will mirror the processes established by the Joint Task Force – Red Hill (JTF-RH) and serves as an impartial assessment to ensure unbiased verification of the tank cleaning quality.

Tier 4: Inspection by DOH and EPA

The fourth and final tier of verification is the inspection by representatives from DOH and EPA. These regulatory bodies will have the opportunity to physically inspect the tank interiors and review documentation to confirm the cleanliness of the tanks.

All documentation, including QV reports, certified inspector findings and reports, photos of cloth rub test results and post-cleaning interior photos inside each tank will be provided to both DOH and EPA to facilitate DOH and EPA’s independent analyses.

Integration and Documentation

Throughout each tier of the verification process, meticulous documentation is maintained to record the cleaning activities, results, and any corrective actions taken. This documentation serves as a transparent record for all stakeholders involved and is critical for regulatory review and concurrence. The multi-tiered approach allows for a robust and comprehensive verification of tank cleanliness, ensuring the integrity of the cleaning process and safeguarding environmental and public health interests

Section 3. Tank Cleaning Quality Verification Methods

There are two primary tank cleaning verification methods used by the tank cleaning contractor, NCTF-RH, and third-party certified inspector to demonstrate the interior of each tank

has achieved the required level of cleanliness in accordance with SP-1. The two methods are visual confirmation and cloth rub test. NCTF-RH will provide the inspector certifications and credentials in an addendum to the Quality Validation Plan, Addendum Tank Cleaning Edition.

Section 3.1. Primary Methods

With responsibility for QC, the tank cleaning contractor will use visual inspection as the method to confirm each tank meets the cleanliness standard identified in SP-1. NCTF-RH is responsible for QA and will also use the visual method to confirm each tank is clean in accordance with the same standard. Finally, the third-party certified inspector will use both visual means and a cloth rub test to confirm each tank is clean in accordance with the same standard. Details from SP-1 on visual confirmation and the cloth rub test are described below.

Section 3.1.1: Visual Confirmation

Society for Protective Coatings (SSPC): Surface Preparation Standard No. 1 – Solvent Cleaning defines clean as follows:

“When viewed without magnification, a solvent-cleaned surface shall be free of visible oil, grease, dust, dirt, drawing and cutting compounds and other visible soluble contaminants. Visible means detectable with normal or corrected normal vision without the use of additional test equipment.”

NCTF-RH is proposing that Tiers 1 through 4 use the above definition to visually confirm each tank is clean. In areas which cannot be visually inspected by personnel due to inadequate access (i.e. standpipes), video inspections will be substituted as an alternative.

The AMPP inspector will rely primarily on in-tank lighting to inspect the tank surface. The inspector will maintain a separate light source for up-close inspection as well as for areas where in-tank lighting is not sufficient. For compatible products, a blacklight (365 nanometer intensity of 4,000 microwatts per square centimeter at 15 inches) may augment inspection to facilitate screening.

For inaccessible areas, such as outside framing of the catwalk and center tower, the inspector will utilize a hand mirror to evaluate cleanliness. For piping inaccessible to the inspector, the contractor will provide camera inspection footage for review after lines are water jetted.

Section 3.1.2: Cloth Rub Test

Society for Protective Coatings (SSPC): Surface Preparation Standard No. 1 – Solvent Cleaning lists four possible additional verification methods that can be used to supplement the visual inspection. NCTF-RH is proposing to use the cloth rub test described in paragraph 6.1.1 of the SP-1 standard.

The process for conducting the cloth rub test is described as follows:

“A clean dry white rag is wiped across the dry-cleaned area(s) and examined for visual residue”.

While tests are intended to verify contamination, DOH and EPA have expressed a need for a minimum sampling frequency for areas that have been cleaned to provide a physical record. After considering contractor production rate and available inspection time, NCTF-RH will sample at 1% frequency (10 SF per 1,000 SF) cloth rub crossing plates and weld surfaces on the tank shell, and a minimum of one (1) wipe sample per 25 linear feet of catwalk and center tower. Each tank has approximately 84,000 SF of tank shell (84 samples locations), 225 linear feet of center tower (10 sample locations) and 50 linear feet of catwalk (2 sample locations), totaling a minimum of 96 samples per tank to augment the rub tests the inspector completes to confirm suspected contamination.

NCTF-RH will rely on the judgement of the third-party certified inspectors to determine whether residue is associated with fuel or simply that of corrosion products, dirt or dust.

Section 3.2. Supplementary Evidence

Section 3.2.1: Gas Free Tank Inspection and Certification

The Gas Free Tank Inspection and Certification is a critical safety measure in the tank cleaning process for the RHBFSF. This critical step ensures that the tank atmosphere is free from hazardous vapors, thereby ensuring a safe environment for personnel entry and subsequent cleaning operations. Although NCTF-RH does not intend to use the gas free tank inspection and certification as a means of supporting each tank is clean, this information will be provided to demonstrate safety compliance with tank entry regulations. Once the tank is initially certified by a marine chemist/industrial hygienist, the contractor is required to daily certify the tank is suitable for entry by issuing a confined space entry permit.

Section 3.2.1.1: Regulatory Compliance

The gas-free certification is not only a fundamental aspect of worker safety but also a compliance requirement per API 2015 and UFGS 33.01.50.55. By adhering to this protocol, NCTF-RH demonstrates its adherence to regulatory standards and its commitment to providing a safe working environment. This procedure underpins the integrity of the subsequent steps in the tank cleaning and verification process.

Section 3.2.1.2: Certification Process

The inspection involves a comprehensive evaluation of the tank's internal atmosphere, conducted by a certified industrial hygienist or marine chemist. The specialist assesses the levels

of various vapors and gases using calibrated detection instruments, ensuring they fall below the threshold limits for occupational exposure and flammability. The gasses monitored and their associated exposure limits are shown in the following table.

Table 1:

Gas	Exposure Limit
Lower Explosive Limit	Maximum 10% of LEL
Oxygen	19.5%-23.5%
Volatile Organic Compounds	15 PPM
Benzene	1 PPM (8-hour TWA)
Carbon Monoxide	50 PPM (8-hour TWA)
Hydrogen Sulfide	20 PPM (8-hour TWA)

The above exposure limits are based on Occupational Safety and Health Administration (OSHA) standards. The tank cleaning contractor may elect to hold tighter standards than those shown above when issuing the daily confined space entry permit.

Section 3.2.1.3: Safety Confirmation

The certification by the industrial hygienist or marine chemist initially confirms the atmosphere inside the tank is suitable for personnel entry in accordance with the table in Section 3.2.1.2.

Section 3.2.1.4: Documentation

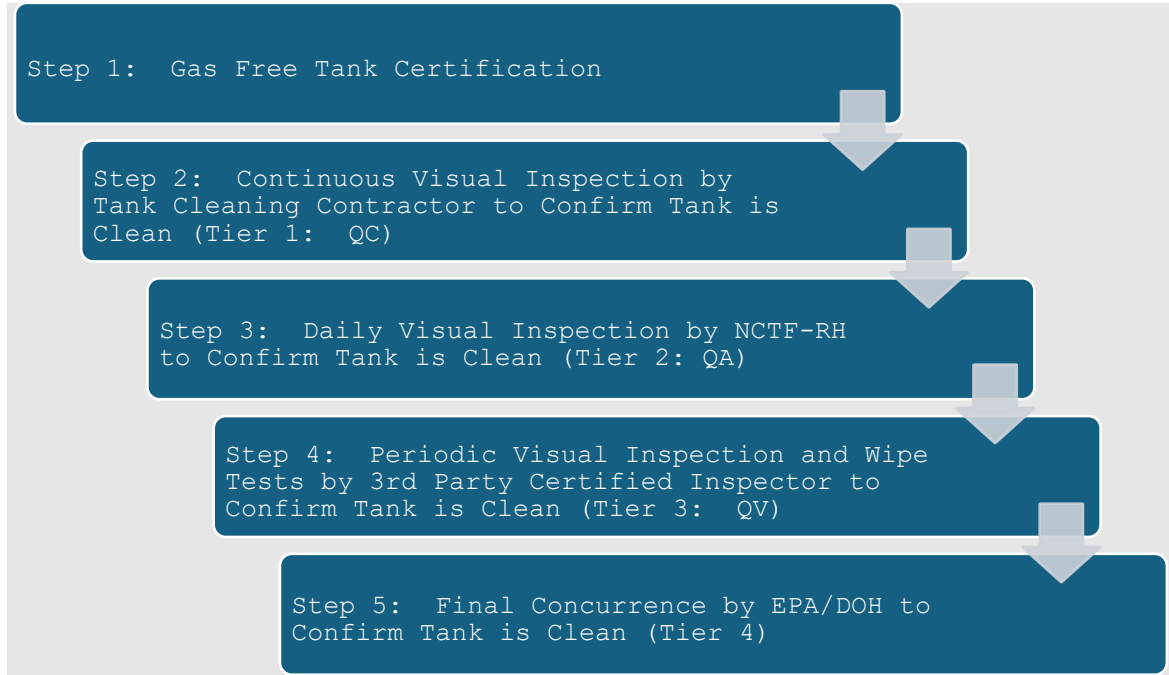
Upon successful inspection, the industrial hygienist or marine chemist issues a Gas Free Certificate, which is a formal document that declares the tank as safe for personnel entry and work. This certificate is an essential document and must be signed before any personnel can enter the tank for cleaning or inspection.

Section 3.2.1.5: Quality Assurance

As part of the quality assurance protocols, NCTF-RH construction managers and engineering technicians confirm the gas free tank inspection and certification procedure, and corresponding documentation is conducted with the utmost diligence and the results are thoroughly documented. The documentation is reviewed as part of the third-party quality validation (QV) program and is retained for records, serving as proof of compliance with safety and health regulations.

Section 4: Process Overview

The following figure describes the proposed process NCTF-RH intends to use to confirm each tank is clean.



During any milestone of the inspection process, if there is doubt about reaching the SP-1 standard of tank cleanliness (whether through the QC, QA, or QV inspection process), NCTF-RH will direct the tank cleaning contractor to perform additional cleaning to meet the standards of SP1. Additional cleaning can range from spot cleaning with water at individual locations to completing additional pressure washing with Simple Green solution followed by additional freshwater rinsing.

Step 1 - Gas Free Tank Certification:

Before any access to the tank is allowed, it is imperative to obtain a Gas Free Tank Certification. This step involves an industrial hygienist or marine chemist certifying that harmful vapors are no longer present, rendering the tank safe for personnel occupancy. This certification is a prerequisite to ensure safety during the subsequent testing phases. This step will be initiated for both pre-cleaning and post-cleaning inspections. Both QA and QC will confirm the Gas Free Tank Certification is initially properly completed and the daily confined space entry permits are issued before personnel enter each tank.

Step 2 – Tank Cleaning Contractor Quality Control:

After ensuring the tank is gas free, the tank cleaning contractor will pressure wash and rinse the internal surfaces of each tank. Once that process is complete, the tank cleaning contractor will

provide photographic evidence with locations identified on a shell roll out diagram documenting the date the section of the tank was cleaned and inspected for quality control. The shell roll out diagrams will document when each area inside the tank was pressure washed, rinsed and inspected as part of the QC process. Visual documentation will include photography during all phases of cleaning operation described above to serve as evidence to support written records. This meticulous approach to visual confirmation and documentation ensures accountability at each step of the tank cleaning process. The detailed records and photographic evidence demonstrate compliance with the established standards in SP-1. Documented results from the visual inspection will provide qualitative evidence. The tank cleaning contractor, in accordance with their QC plan, will visually inspect and document throughout the cleaning process. These inspections are a critical element of their QC program, ensuring that no residual product or sludge remains. Tank cleaning contractor personnel are trained to meticulously inspect every area of the tank's interior and to verify surfaces are visually free of fuel and sludge.

Step 3 – NCTF-RH Quality Assurance:

The primary qualitative method of verifying tank cleanliness is through the use of visual inspection.

Once the tank cleaning is complete and the interior is dry, the NCTF-RH QA team conducts a thorough inspection to verify the absence of any product or sludge. This step confirms the effectiveness of the tank cleaning contractor's cleaning efforts and is essential before the tank can be certified as clean.

As part of the NCTF-RH quality assurance, NCTF-RH will observe and document the following through the use of photographs:

- Visual inspection to confirm all liquids have been removed from each tank.
- Visual inspection to confirm all sludge has been removed from each tank. □ Visual inspection to confirm each tank has been cleaned in accordance with SP-1.

QA will be present throughout the cleaning process. The Navy QA personnel will be certified to enter the tank and ride the baskets under the tank cleaning contractor's supervision. The Navy QA team collects photographs during the tank cleaning process from the tank cleaning contractor as well as uses their own photographs to document the cleanliness level of each tank. The QA team will document the procedures executed by the tank cleaning contractor. The QA team will spot check the contractor throughout the process. If QA inspections identify any shortfalls in meeting the tank cleaning standard of SP-1, NCTF-RH will notify the contractor so further cleaning can be conducted until standards are met.

Step 4 - Quality Validation:

The final step is a comprehensive quality validation (QV) of all gathered documentation and collected data. This QV is integral to the verification plan, ensuring that the tanks meet the established cleanliness criteria and supportive lines of evidence to support tank closure.

The independent third-party certified inspection quality validation (QV) contractor will perform an independent review of the cleaning process. This includes examining plate roll out diagrams that record the date each section was cleaned, rinsed, and visually inspected by QC and QA personnel, photos of the interior of each tank, and photos of the results of the cloth rub test. The QV process confirms that the cleaning contractor's methods have been thorough and up to the prescribed standards.

Photographs and cloth rub tests will be collected by the third-party certified inspector to clearly demonstrate the tanks are within the required standard of cleanliness, or to inform whether additional cleaning is needed.

Following successful cleaning of each tank, photos of the tank interior, photos of cloth rub tests and a map of each tank will be documented. This documentation includes the location, conditions of the sampled area, and cloth rub test results.

The quality validation report for each tank will include the following:

- a. Tank I.D.
- b. Product Services
- c. Cleaning Process
- d. Recovery Process and Destination of Removed Sludge / Sludge Volume Removed / Volume of Rinsate (measured at distribution meter) / Volume of Simple Green consumed (visual estimate based on consumption)
- e. Any Interior Repairs or Modifications to Tank
- f. Contract/ Service Order
- g. Description of QA Validation
- h. Third-Party AMPP CIP Inspection Reports / Photos
- i. Tabulated Results of Testing Performed
- j. Summary Drawing of Sample Locations
- k. Photographs (including screen captures of camera inspections of decommissioned product lines)
- l. Government Acceptance

Visual confirmation is evidence to support tank cleaning verification, designed to ensure that all surfaces within a tank are free from product residues and sludge post-cleaning. The QC, QA, and QV will all confirm the cleanliness for each tank meets the requirements of SP-1 using visual confirmation supported with photographs. Any area failing to meet the cleanliness standards

of SP-1 will be pressure washed and rinsed again until clean. This step is crucial for both QC, QA, and QV, and it requires meticulous documentation.

The comprehensive documentation process captures all facets of visual inspection. Written records detail each inspection's date, exact location within the tank, and the findings of the inspection. Photo documentation supplements written records, providing a visual account that showcases the condition of the tank surfaces during each phase of the cleaning operation. Because this documentation process is cumulative throughout the tank cleaning process and does not rely on off-island testing, NCTF-RH expects the QV reports can be issued within two weeks of completion of the tank's cleaning. The volume of rinsate will be measured by water usage meters at the source connection point. The volume of Simple Green consumed will be tracked by visual inspection of used containers.

Step 5 – Regulatory Review:

By providing this information, NCTF-RH will provide an industry standardized qualitative assessment of tank cleanliness, aligning with environmental safety objectives and regulatory requirements. The inclusion of cloth rub tests during the tank cleaning process fosters a rigorous, transparent, and thorough verification process.

Section 5: Tank Cleaning Verification Documentation

The verification of tank cleaning at the RHBFSF entails comprehensive documentation to ensure transparency, regulatory compliance, and the highest standards of environmental safety. The following components form the backbone of the documentation process:

1. Marine Chemist/Industrial Hygienist Gas Free Certification

A crucial aspect of the verification process is the safety of personnel entering the tanks. An industrial hygienist or marine chemist provides a report certifying the absence of harmful volatile vapors, ensuring the tank is safe for human entry. This certification includes measurements of hydrocarbon levels, oxygen content, and the presence of other potential hazards contributing to the comprehensive safety profile for the cleaning operations.

2. Photographic Evidence of Tank Conditions

A visual record is essential for capturing the tank's final cleanliness state to confirm it meets the requirements of SP-1. Photo documentation will include images of:

1. The tank during cleaning activities, illustrating the cleaning in progress;
2. Post-cleaning condition, demonstrating the cleanliness of tank surfaces after the procedure (documenting both visual inspections and results of cloth rub tests); and

Enclosure (1)

3. All phases of the tank cleaning verification activities, including QC by the cleaning contractor, QA by NCTF-RH, and QV by a third-party certified inspector.

Photographs serve as a visual corroboration of the written records and offer clear evidence that each tank has achieved the level of cleanliness as defined in SP-1. Locations of photographs within the tank will correspond to the location system used on a shell roll out for each tank.

3. Cloth Rub Test Results

To assess the effectiveness of cleaning, cloth rub test results will be recorded and photographically documented. Additionally, these cloth rub tests will be cataloged and archived for review by both EPA and DOH to support their concurrence that each tank has been successfully cleaned. These results serve as an additional verification method to confirm the tank cleanliness meets the requirements of SP-1.

4. Shell Roll Out Diagrams

The tank cleaning contractor will be responsible for providing a shell roll out for each tank to aid in documenting locations of photographs, cloth rub tests, and dates documenting when internal surfaces have been cleaned, rinsed and inspected. An example of a typical tank shell roll out is included in Appendix A.

5. Verification Activity Log

A detailed log captures the frequency of all verification activities, annotated with the time, date, and specific location within the tank. This record includes:

1. The nature of each verification activity, whether visual inspections or cloth rub tests.
2. Corresponding photographs of areas of each tank, documenting both visual inspections and cloth rub tests.
3. The specific section of the tank being inspected or tested, providing spatial context to the cleaning and verification efforts.

This documentation ensures an auditable trail of the verification process, enhancing the reliability and integrity of the cleaning efforts.

Section 6: Sample Size

In determining the appropriate sample size for the cloth rub test in this Revised Tank Cleaning Verification Plan, NCTF-RH will rely on the expertise of the third-party certified inspector to determine the number of cloth rub tests in each area of the tank. This allows the third-party certified inspector to determine the areas that should be focused on to confirm the entirety of each tank is clean in accordance with SP-1. This process allows inspectors to forego areas that are easiest to clean and focus on hard to clean areas such as patch plates, welds, and structural members on the catwalk and center tower. By concentrating the majority of cloth rub

tests in these areas, the third-party certified inspectors ensure that the data is collected from the most severe areas of the tank, thereby adopting a conservative stance in the verification process. Through this strategic sampling distribution, NCTF-RH underscores its commitment to a methodical and scientifically sound approach to environmental stewardship and regulatory compliance.

The following table provides an approximate guideline of the percentage of samples in each area of the tank. This table will be adjusted according to the number of cloth rub tests conducted by the third-party certified inspector.

Table 2:

Location in Tank	Percentage of Samples
Upper Dome	10%
Barrel/Extension Ring	55%
Lower Dome	20%
Center Tower/Catwalk	15%

Section 7: Summary

The following table summarizes the roles and the efforts being used by each entity to confirm the cleaning meeting established industry standards in accordance with SP-1.

Table 3:

Responsible Party	Tank Cleaning Contractor	NCTF-RH Construction Manager/Engineering Technician/Quality Validator	Third-Party Industry Certified Inspector	DOH/EPA
Tier	1	2	3	4
Role	Quality Control	Quality Assurance	Quality Validation	Regulatory Agency
Cleaning Verification Method	1. Visual IAW SP-1 Paragraph 2.1.	1. Visual IAW SP-1 Paragraph 2.1.	1. Visual IAW SP-1 Paragraph 2.1 (including photo documentation submitted as part of the final quality validation report). 2. Cloth rub test IAW SP-1 Paragraph 6.1.1 (including photo documentation submitted as part of the final quality validation report)	
Documentation	Gas Free Certification, Photos of Cleaned Surfaces, Tank Shell Roll out Diagrams	Photos of Cleaned Surfaces, Daily Inspection Reports	Photos of Cleaned Surfaces, Archived Cloth rub tests with Corresponding Photos, Tank Shell Roll out Diagrams, Quality Validation Report	Written Confirmation of Tank Cleanliness Acceptance
Frequency	Continuously	Daily	Approx. three times per week, depending on cleaning production rate	As Desired

The comprehensive documentation of tank cleaning verification is designed to uphold stringent environmental standards, ensure worker safety, and provide clear evidence that all tanks are clean.

References

1. NCTF-RH Tank Cleaning Verification Plan dated January 10, 2024
2. NCTF-RH Revised Tank Cleaning Verification Plan dated April 12, 2024
3. U.S. Environmental Protection Agency, Region 9 letter to NCTF-RH dated May 8, 2024
4. SSPC: The Society for Protective Coatings (SSPC): Surface Preparation Standard No. 1 – Solvent Cleaning
5. American Petroleum Institute Publication 2015 “Requirements of Safe Entry and Cleaning of Petroleum Storage Tanks”
6. American Petroleum Institute Publication (API) RP 1604 “Closure of Underground Petroleum Storage Tanks”
7. United Facilities Guide Specifications 33 0150.55 “Cleaning of Petroleum Storage Tanks”
8. National Fire Protection Association 326, “Standard for the Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair”