

**Red Hill Administrative Order of Consent Scoping Meetings
30 Nov – 4 Dec**

Introductory Session:

Meeting Date/Time Outline:	SOW Section
11/30 0800-1000	Kick-Off
11/30 1030-12/4 1300	7.1 Groundwater Flow Model (GFW)
“	7.2 Fate and Transport Model (F&TM)
“	7.3 Groundwater Monitoring Well Network (GMWN)
“	6. Investigation and Remediation of Releases (IRR)
11/30 1230 - 12/1 1600	2. Tank Inspection, Repair, Maintenance (TIRM)
12/2 0800 - 12/3 1130	3. Tank Upgrade Alternatives (TUA)
12/3 1230 - 12/4 1300	8. Risk/Vulnerability Assessment (RVA)
12/4 1300-1500	Management Out-Brief

All Parties' Goals:

-“Agree on as much scope as we can this week.” CAPT Tufts

1. Clearly identify each organization's expectations.
2. Focus direction to categorize proposed activities and decision points as:
 - a. agreed
 - b. undecided
 - c. disagreed – place into buckets for further discussion
3. Reach agreement on overall framework to meet AOC-SOW Requirements
4. Identify majority of issues as ‘acceptable’
5. Establish action items and assign responsibilities to decided or disagreed issues in the meeting.

Rules for the meetings:

1. Don't interrupt someone speaking
2. Open mind, understand of the points of view
3. Avoid side conversations
4. Stick to SOW
5. Speak up so everyone can hear the points
6. Remember this is scoping, [not making a decision today on BAPT]
7. If asserting fact, explain why
8. Acknowledge vulnerability/transparency, okay to say, “I don't know”

Use Best Processes:

1. Go over agenda
2. Parking Lot: table any issue that is too far in weeds, that need more detailed discussion
3. Balance between depth and getting the SOW written
4. Make sure everyone is on board – check in with folks
5. Clearly frame the question

6. Technically discuss the issues.
7. Balance: striking between what went on and what can be done better, the focus is what can be done better

Expectations for the meetings:

1. What are the actual things that need to be done to implement the task
2. Write SOW as much as possible, pretty close to what looking for as regulatory agencies
3. Evaluation of current processes
4. Proposed practices going forward
5. BMPs that can be applied to Red Hill tanks

Red Hill Administrative Order of Consent Scoping Meetings
Red Hill SOW Section 2 – Tank Inspection, Repair, and Maintenance (TIRM)
Scoping Meeting Summary
11/30 – 12/1/2015

A. Introductions/Opening Remarks/Section Agenda Review & Changes:

- Navy/DLA
NAVFAC EXWC: Terri Regin (Section 2 Lead), Leslie Karr, Miguel San Pedro, Mike Rocha, Frank Kern, Tom Tehada – Corrosion/Cathodic Protection SME (Section 5 Lead)
NAVFAC HI: Jimmy Miyamoto, CDR Vogel
NAVSUP FLC PH: John Floyd (Section 4 Lead)
NAVSUP Energy: Danae Smith
NAVFAC PAC (11/30 only): Perry Nakaoka, Stephen Fujino (Section 3 Lead), Debbie Loo, John Sato (Section 8 Lead)
DLA: Elton Saito, Ron Nelson, Robert Krouse, Rocky Krill (11/30 only)
EEI: Steve DiGregorio, Steve Brooks, Kevin Murphy, Doug Kieley
- EPA: Steve Linder, Omer Shalev; Consultants: Doug Schwarm, Phil Myers
- DOH: Steven Chang, Roxanne Kwan, Josh Nagashima, Roy Ilaga, Jenny Bernier, Stuart Yamada, George Tabil, Thu Perry

Contents of Tank Inspection, Repair, and Maintenance (TIRM) Procedures Report, SOW Section 2.2

EPA's thoughts on the flow of the Report:

- Current Procedures – what was the procedure for Tank 5
- Lessons learned – what was learned from Tank 5
- Improvements – what we choose to do in the future, and why we chose NOT to do things because it is NOT practicable, but set up the factual basis to make a good decision
- The report needs to list the pros and cons of each option, benefits/costs, what is the criteria/values for making the decisions (costs, safety, schedules/time to put down)

The Navy/DLA agreed to include these items for the report. The technical background and information has to be included in the report so all will be on the same technical level in order to understand the reasoning behind the options and the pros/cons in the discussions.

ADD “INTRODUCTION” to the TIRM report. During the discussions, EPA/DOH determined that a short Introduction should be added to the TIRM report. The following is a description of this Narrative:

Executive Summary: Footnote/executive summary, of what happened in lay terms to help inform the public. Include: Simple sequence of events of spill (explain clearly spill wasn't

because tanks are old but because of poor workmanship), Standardized DoD procedures with some modifications for Red Hill, and the rationale of why the Navy did what was done.

Provide the location of the 17 testing failures, even general quadrants, explain the difference between failure, leak, and release, and cause of “failures”. A drawing does NOT exist right now showing the failure point(s) in Tank 5. A lesson learned is to identify on a drawing where a leak occurred if there are any future releases which may help to determine the environmental impact of a release.

ADD “CONSTRAINTS/LIMITATIONS” to the TIRM report.

Constraints/limitations discussed included staging, electrical power, Environmental concerns, Safety concerns, weather, access to the tanks, etc. This can be a standalone paragraph at the very beginning of the report to provide a framework for what is feasible and what is not due to these limitations; or put into each section. EPA/DOH will leave the formatting to Navy/DLA’s discretion.

The discussion started with the Lessons Learned.

2.2.b. Discussion of Lessons learned from Tank 5 and related modifications to current procedures;

- a. Navy provided the analysis of Lessons Learned:
 - 1) Human-factor issues with QC
 - Navy/DLA: The RFP did not go into detail on how to execute the work, and specifications were minor, welders were inspecting themselves, did not have a requirement to provide quality control.
 - 2) The government relied too much on KTR QC.
 - Navy/DLA: The Navy did not go in depth in reviewing the report, assuming that the Contractor knew what he was writing and that he was executing the work and providing the required QC in accordance with the contract.
 - 3) Release was not attributable to corrosion-related defects.
 - Navy/DLA: The Contractor welded on patch plates on corrosion areas and other defects. The leak occurred due to the poor-quality welds on the patch plates that covered the holes that were drilled in the tank to test for gases that could result in an explosion during the welding process. Post release inspection revealed numerous weld defects in the repairs made by the contractor.
 - 4) It was discussed that six (6) tanks had been previously inspected and repaired successfully. The prime contractor was not the same for each award, but the subcontractor that performed the inspection was the same. The report should state why there was a failure in Tank 5 and not the other tanks. EPA/DOH is concerned about these other 6 tanks without proper documentation to show what was accomplished in these tanks.
- b. Discussion on way forward in providing the analysis.
 - 1) What current documents are required to provide information to EPA/DOH that the same issue that occurred in Tank 5 was not encountered for the previous

- six tanks? Navy/DLA is to locate the documents and determine if they can be provided to EPA/DOH.
- 2) What changes to our process is required to substantiate the analysis was discussed.
- c. Contracts: The Government is required to abide by the Federal Acquisition Regulations (FAR) and utilizes performance vice prescriptive specifications.
- 1) EPA/DOH would like the contract that was awarded for Tank 5. Navy/DLA: Will determine if there is any protected information before release to EPA/DOH.
 - 2) Lesson learned: The contract must be more specific to explain expectations. As a lesson learned, the Navy/DLA is changing their process to require drawings and procedures. More on this topic will be explained in the "Discussion on improving current TIRM" agenda item later.
- d. EPA/DOH stated: The report is to define what is considered to be a failure, develop a formal system of analyzing failures, differentiating between incidences and near misses, and if there is an incident, then a process is in place to do an investigation to understand the failure.

SOW Section 2.2.a. Current TIRM procedures/Historical procedures

EPA/DOH: The following points are to be covered for each subtask:

- a. existing practices,
- b. what the contract states (including sub-contractor work/contracts), was a specification used?
- c. what the contractor actually did,
- d. is there an exception/modification to the contract/spec,
- e. prep work to do the inspections/repair
- f. validation of the repair/inspection techniques

The Navy/DLA concurred to provide this information in the TIRM report as applicable to the sub-task.

PART I - INSPECTION

- a. Non-destructive testing –
 - 1) LFET, BFET, UT, MT, Dye Penetrant, Pressure Test, Vacuum Test
Include the inspection of the welds and base plates, enough description of what is being inspected, and what techniques - since welds are being inspected.
 - 2) Provide equipment capabilities/reliabilities and personnel qualifications requirements. Also, were names included on who did these tests?
[If not, lesson learned to identify which person did which tests on what welds.]
 - 3) Provide the procedure in performing the testing: Sequencing of the order of tests completed, complement each other

- 4) Provide the safety hazards involved during the testing
 - 5) Provide the environmental controls equipment required
 - 6) Provide the electrical requirements to maintain the environmental controls & equipment.
- b. Destructive testing
 - c. Quality control, includes both prime and sub-contractors
 - ACTION: Navy will review to ensure nothing is proprietary or procedures for releasing are completed prior to providing the contractors' QC plans
 - d. Welding – Welding will not be covered in this section, since welding is not an inspection task.
 - e. Other inspections: Coating inspection, structural integrity (i.e. center column) inspection, anything required in the API 653 checklist that is not discussed earlier-will list each inspection in the draft outline.
 - f. Nozzle inspections: discuss each method that is done, limited to piping coming out of the tank through the rock to the first valve/fitting. The Contractor did a hydrotest on the nozzles that was inconclusive. A visual and UT inspection was performed on the 32" nozzle.
 - g. Recommissioning: If no repairs are needed, then the tank will be recommissioned, as discussed in Part II-Recommissioning.
 - h. Documentation Practices: The report will provide information on the management of the recordkeeping of the Inspection Records/Results, such as the archive/distribution strategy.
 - i. What repairs are going to be done? Procedure on Repair Scope:
 - o EPA/DOH comment: Possible issue: lack of consistency with differing contractors/personnel doing the inspection.
 - o (BMP/lesson learned: document what inspection was done on each weld, who did the inspection (per weld), auditability/oversight function – add to "Lesson's learned" section.)

PART II - REPAIR

- a. Non-destructive testing –
 - 1) UT, MT, Dye Penetrant, Pressure Test, Vacuum Test
 - 2) Provide equipment capabilities/reliabilities and personnel qualifications for NDT requirements (Navy/DLA will try to provide the actual certifications)
 - 3) Contractor provided the procedures that they will follow in performing the repairs
 - o Navy/DLA: Will try to locate the Contractor's Work Plan and determine if there is any protected information before release to EPA/DOH. The Work Plan is a narrative of the procedures that they will follow. It is not a performance or prescriptive Specification. In addition, there is the question if the Contractor performed the work per their own Work Plan due to their lack of Quality Control.
 - o EPA/DOH: They would like to know the Differences between how a different Contractor repaired Tank 6 vs how the Contractor repaired Tank 5.
 - 4) Provide the safety hazards involved during the Repairs

- 5) Provide the environmental controls equipment required
- 6) Provide the electrical requirements to maintain the environmental controls & equipment.
- All agreed to look at moving items 4, 5, and 6 upfront at beginning of report to outline all the limitations.
- b. Destructive testing
 - Navy/DLA: Not performed for Repairs on tank 5, but plate(s) have been removed from other tanks for testing. These plates are located in Pittsburg, on island, and at EEI. No destructive testing on plates has been performed on Tank 5.
 - EPA/DOH: Explain why plates were taken out of other Red Hill tanks
- c. Quality control.
 - Navy/DLA: QC was discussed in “lessons learned” and we will discuss this more in detail in section 2.2.c. later.
- e. Welding:
 - o EPA/DOH: Provide the procedures, certifications and performance qualifications of the personnel doing the welds outlining which ones could do which welds.
 - Navy/DLA: Will try to locate these submittals and determine if there is any protected information before release to EPA/DOH.
- e. Tank Repairs: Will be included.
- f. Nozzle Repairs:
 - Navy/DLA: No repairs had to be done for Tank 5
- g. Recommissioning (after maintenance or repair of tanks taken temporarily out of service);
 - o Navy/DLA: Discussed the issues we had during recommissioning,
 - o All agreed that the report should explain Suitability to Service letter/statement by a API 653 and a P.E., how is the filling process monitored, the requirements of MO-230; Tank 5’s contractor did provide Suitability for Service letter – but not the formal review process per the NAVSUP GLS instruction (This instruction was not published at the time Tank 5 was commissioned).
- h. Recordkeeping:
 - o All agreed that the report should provide information on how Navy/DLA update the as-built records for the next time the tank is taken OOS and who keeps the reports (DTIC, FLC, etc.). The report is to include information about the required construction completion report.

PART III – MAINTENANCE

This section of the report is to provide the following information:

- a. Alarm operation and testing
- b. Calibration
- c. Mirroring validation: stick gauging to ensure ATG
- d. Internal Maintenance/inspection checklist(s)
 - ACTION: FLC Pearl Harbor as lead to provide this, which is day to day/operational maintenance, provide to EXWC NLT 1 January 2016.

2.2.c. Quality Control & Assurance (QC & QA) of TIRM

- a. Contracting Methods, FAR Regulations, Overarching Strategy.
 - o All agreed that this information should be included in the Introduction/Narrative in report to provide consistent “Level of Knowledge” throughout all parties.
 - o Navy/DLA: provided the following information concerning the Contracting Methods and constraints that they have used in the past.
 - 1) Early 1990’s the Contracting Officer deemed that the pipeline inspections can be considered as engineering services (under Brooks Act). Later on we applied the same reasoning to the tank inspections, and then for Tank 5 inspection/repair. The Contract was based on schedule, quality of personnel, and price. The Contract cannot include prescriptive specs. The contractor is required to submit a Technical Proposal, which provides the means & methods that he plans to execute, and then this may be negotiated.
 - 2) Recently, Navy/DLA decided that the contract is performing more repair than inspection, so they have changed contracts to a design/build model. This requires the Contract to be written as in a “6-part Format” which includes performance specs.
 - 3) Navy/DLA does not have a performance specs on Tank inspections and Tank Repairs. They do have welding and coating specs for pipelines.
 - 4) Navy/DLA has a specification that requires the Contractor to submit a quality control plan. This plan is to describe all of the quality control work that will be done.
 - 5) The “6-part Format” requires the Contractor to develop “plans and specifications” of the required repairs for Government approval. The previous process did not require the Contractor to provide plans and specs.
 - o EPA/DOH:
 - o The process must require documentation of exactly what work the contractor did.
 - o How does the Navy review the plans, provide feedback, and ensure that the plans have enough detail?
 - o Process for the contractor to provide plans and the approval of the plans (who does final approval, comment/feedback period).
 - 6) The Navy/DLA has not in the past performed third party or for additional Government QA for the Clean, Inspect, Repair Tank Projects in general. This is an additional fund request and a separate process that is not normally performed on NAVFAC projects.
- b. Quality Control and Assurance of TIRM;
 - 1) Improve DoD criteria for Contractor Quality Control for test personnel, equipment, data recording, data prove-ups, analysis of data, etc.
 - o Navy/DLA stated the following for consideration:
 - o The Tank Inspection and Tank Repair Performance specifications will include detailed QC requirements, such as for the equipment verified before use, the inspectors are certified, etc. The QC requirements are

- enforceable. The Contractor will be required to demonstrate that they can do the tests to the level of accuracy,
- The Navy moved to Contractor Quality Control in the 1980s. The Government performs Quality Assurance (QA) which does limited independent testing to check Contractor's QC and validate the Contractor's inspection techniques. Government reviews and approves (or negotiates) the Contractor's QC and then ensures the plan is implemented. The Government 'oversees' the quality control.
 - Extent of Quality Assurance is dependent upon the resources available & constraints: geographic location, time, expertise, etc.
- 2) Improve DoD Criteria for Submittal requirements for API 653 Inspectors (level of experience), welders, NDE technicians, materials.
 - Navy/DLA stated the following for consideration:
 - The Tank Inspection and Tank Repair Performance specifications will include detailed submittal requirements such as the certification of the inspections, welders, NDE technicians and materials.
 - 3) Improve DoD Criteria for procedures for welding, NDE, etc.
 - Navy/DLA stated the following for consideration:
 - The Tank Inspection and Tank Repair Performance specifications will include detailed Workmanship requirements such as how to do door sheet cut out, how to repair the holes that are drilled, testing, and documentation.
 - The Navy/DLA will provide the Draft specifications to all parties interested, at some point in the future since this information will be available on the Whole Building Design Guide web site and is not procurement sensitive. In fact, outside consultants/engineers/contractors are encouraged to comment on these specifications.
 - 4) Hiring a third party QA for Tank 5 repairs. Lesson learned is considering this in the future for all Red Hill tanks (pros and cons for this).
 - Discussion that there are pros and cons for third party QA. See discussion below.
- c. Discussion of development and execution of a QA Plan to review the Contractor's QC responsibilities.
- Navy/DLA stated the following for consideration
 - 1) We previously used a QASP (Quality Assurance Surveillance Plan) for Tank 5 as a service contract, it included generic language.
 - Provide the Tank 5 QASP as Appendix to the TIRM.
 - 2) We went back and wrote a site specific QA Plan for the re-work for Tank 5
 - Provide this site specific QA Plan
 - Action done immediately (so overlap with No. 6)
- d. Discuss NAVFAC Business Management System (BMS) for Quality Assurance
- Provide the BMS as appendix to the TIRM
 - Quality Assurance Strategy: Identify Government roles briefly (both NAVFAC EXWC and HI), then project manager that is overseeing the work

- product – what is the standard that must be met? Provide Specific training requirements.
 - “Title 2”: is the Government version of an independent QA.
- EPA/DOH: Requested the QA/QC history for the other tanks at Red Hill. Provide any lessons learned from the past. Provide any knowledge transfer between the Contracting Officers, the internal peer review system, and the template that is updated over time.

2.2.d. Discussion for improving the TIRM procedures

- Consensus: Discussed the requirement to develop options that can then be used during the Decision-Making Process. The decision-making criteria -what are the improvements of the TIRM procedures in terms of the pros/cons, costs, times, etc.
 - It will take about a year to develop these specifications.
- a. Discuss the development of a UFGS (Guide Specification-template that is established, then when do project, customize to meet that specific project) for tank inspection.
 - 1) Provide QC criteria for the inspection design & personnel [see above]
 - 2) Performance requirements for establishing corrosion rate [see below]
 - 3) Performance requirements for determining TIRM
 - 4) Provide requirements to repair tank after destructive testing
 - 5) Provide submittal requirements
 - 6) Provide material criteria
 - 7) List is to be expanded.
- EPA/DOH stated the following for consideration: **CORROSION (some of discussion falls under Section 5)**
 - How fast is the tank corroding, confidence level of the rate? The API standards have a simple minded approach for setting of equipment lifetimes using a linear logarithm; problem is corrosion is not linear.
 - Better/sophisticated corrosion rate: Collect data on pit depths, plot, and assign survival curve; Poisson distribution, can the data be made available, sample that is representative (3 regions: top dome, shell, bottom dome).
 - Some level of confidence in the measurement to obtain the true amount of pitting.
 - Increase the confidence of inspection – now: volumetric metal loss, so will be blind to the needle point holes, How to eliminate the blind spots: overlap tests.
 - Should this be done? Plates are 70 years old, so why are we confident there are no pits? Navy scans 100%, but if the scan detection rate is low, this isn’t useful.
 - The steel plates quality are questionable, how to show the quality of each steel plate; chemical analysis/sampling, which can be expensive.
 - What caused the Red Hill tank failures? Few well documented leaks, but these leaks show that in some isolated places: cracking at weld seems, quality of the bottom nozzles, pitting.

- So possible improvement options to consider during repairs: replace the bottom nozzles, replace the entire steel inner shell of each tank
 - Not likely causes: metal fatiguing
 - Consider as improvement during inspection.
 - Remove plates in all 3 regions, to see external side of the plate to determine level of pitting
- b. Discuss the development of a UFGS for tank repair
- 1) Require design of repairs prior to mobilization by an API 653 certified engineer / P.E. experienced in repair of the Red Hill Tanks
 - Navy/DLA stated the following for consideration:
 - Requiring a design engineer to be a part of contractor's team that does inspection work.
 - Requiring the drawings/design to show the anomaly, ensure that patch plates are correct (spacing), and codify documentation requirements prior to the repair taking place.
 - EPA/DOH: Consider as improvement: multiple certifications, the certified API 653 engineer may be good at inspecting, but NOT the actual repair work; harder for government to enforce all of these folks doing certification/Serviceability letter
 - 2) Require QC requirements for the design and personnel [discussed in QA/QC section]
 - 3) Refer to coating specification for coating [see below]
 - 4) Refer to welding specification for welding of pipelines
 - 5) Develop welding criteria for welding of tanks
 - EPA/DOH: Welding rod selection – option to do higher quality weld (considering costs), Sheer weld/lack of fusion (no discontinuities in welds) - mostly found in bottom nozzles, full penetration welds, double welding, 2" versus 6" patch plate; etc.
 - 6) Provide material specifications (type of steel for patch plates); shell it's low carbon steel-new material, bottom of the tank – more important to focus on
 - 7) Provide minimum requirements for repair:
 - Go through API 653 and provide minimum requirements.
 - Provide method to repair the drill hole (or is it even required - or the amount and size of the holes, i.e. plug fill if ½" hole).
 - Include lateral limits on when the plates will be rolled, versus when they're hammered.
 - Specify size: 1/16" or 1/32" of gap.
 - Specify minimum corner radius.
- EPA/DOH provided the following items for inclusion into the report.
 - **Staging:** baskets, scaffolding strategies, floating platform –Why did Navy choose baskets; what are the criteria involved to determine the choice between the staging, what are the constraints, discuss initial cost versus final

costs – if can have more people on scaffolding, instead of only one person in a basket. Factors: Time: to install the staging area versus the amount of time to inspect/repair using the staging area (i.e. scaffolding – take more time to build the platform, but less time to do inspection; while basket: less time to build/install and more time for inspections); methods-100% scanning takes time; move the scaffolding from one tank to another; safety issues;

- Options for improvement for the current configuration of the tank itself (not considering upgrades in this report)

- **Coatings:** How well can we inspect a tank that has a failed coating system? Until we go inside the tank and see the condition of the coating, the Navy is not going to tell the contractor to remove the coating (a modification option will be put into the contract to remove the coating if it is bad). If the coating is bad, sandblasting/removal of the coatings in entire tank will be identified to be able to do good visual weld.
 - What was done in Tank 5's previous coating? Bottom coating failed-so it was removed, barrel coating was left on in Tank 5,
 - Under Tank 5's contract, assumed the bottom's coating failed so needed to be re-coated during repair portion. Will discuss the recoating: what coating was used? what procedures for coating?
 - Possible Improvement: Add coatings after repair to the welds, to prevent porosity in welds.
- **ACTION:** Include current military coatings specification as an appendix to the TIRM.

2.2.e. Schedule/frequency of tank inspections, repairs, and maintenance.

- a. The GOVT is more Risk Adverse than API RP 580
 - 1) mission requirements, Self-insured, Public, FAR requirements
 - b. The suggestion of performing a CIR tank project continuously (similar to the Golden State Bridge inspect/repair project) can be investigated.
 - c. Discuss Inspection/Repair procedures vs time vs # tanks that can be taken out at a time. Explain why the government takes 3 tanks down at a time: not a funding constraint; previously, only contracted two tanks at a time, not 3.
- EPA/DOH: Need to understand why can't more tanks be taken down and why is the process so long?
- Constraints:
 - operations,
 - physical limitations (entry/exit, bringing in people, materials),
 - power (or not if they are now required to provide own power)
 - qualified personnel – certifications
 - getting security access – 3 months process, and completely clean record

- acquisition contracts – outline timeframe from when schedule tank out of service, to actually taking tank out of service
- Unique Tanks: one-off systems to install staging, timeline, costs
- Accessibility
- d. Why is a particular tank chosen for the clean/inspect/repair?
 - Periodicity
 - Prioritization
 - Operations

2.2.f. Actions that can be taken throughout the facility, as soon as practicable, to reduce risk of release that can be implemented independent of tank upgrades.

- Navy will develop an Action List that shows all the items that we have done or are in the process of accomplishing or that is planned/committed through the Red Hill Facility to reduce risk of release. This will be a living document that will continually be updated.

For each action, define scope, schedule, performance goals, how the action reduces vulnerability/risk and what the risk is (bulleted list for each action)

- a. Continue with inspections
 - b. Use new criteria documents
 - c. Adapt new QC and QA processes
 - d. Fire suppression system with oil/water tight door
 - e. Work with Teams working on Sections 4 and 5 and incorporate findings into TIRM as appropriate
 - f. Electrical power concerns affecting TIRM – DLA will provide latest plan which is increasing electrical power at Red Hill to Navy by 11 December 2015 to incorporate into the TIRM report.
- EPA/DOH: Unmanned inspection methods (ROVs): not comfortable doing this without proven evidence; wires holding center column causing obstruction; very limited commercially to execute/get the equipment; possibly use as a screening tool

Overall in the report:

1. Cite each reference
2. Make references available (prefer electronically), if not protected information.

B. Action Items

- 29 January 2016: Navy targeting a draft outline. Outline will include bulleted list of what content will go in the report with some of the data/script. Navy/DLA will share with EPA/DOH the draft outline NLT 5 business days prior to further discussion meeting:
 1. Tank 5 Repairs, reports not yet provided
 2. Investigation Analysis/Results
 3. Contractor's QC Plans for both Inspection & Repair (for contractors and sub-contractors)

4. QASP
5. Site-specific QA Plan for Tank 5 warranty work
6. NAVFAC BMS
7. Actual contractor data on the repair work done
 - If the document is on the shared website, Navy will identify the specific document
 - If the document is not on the shared website, Navy will determine if protected information prior to release.
- Navy/DLA counsel may need to review this draft report prior to submitting to EPA/DOH to determine what is privileged and not privileged within the document [this may impact the 29 Jan target]
- Navy FLC to Navy EXWC: Operational maintenance (see Part III-Maintenance) by 1 Jan 2015
- DLA to Navy EXWC: Electrical Power plans by 11 Dec 2015

C. Additional Scoping Meetings Required?

- Mid-February: Meeting will be held to discuss draft outline and the need any additional scoping meetings.

After Section 2 Completion additional discussions on Section 4 & 5 are summarized below:

15 January 2016: Navy/DLA revise outline.

Section 4 (modify the outline): Alarm systems for the filling procedure; leak detection system to control risk, reduce on false positives;

- a. Incorporate new NAVSUP instruction to return the tank to Service.
 - John Floyd will provide this information to Terri Regin.
- b. Provide alarm response protocol – created new procedures to address alarms
 - John Floyd will provide this information to Terri Regin.
- c. Entire AFHE system undergoing \$7M refurbishment

Red Hill Administrative Order of Consent Scoping Meetings
Red Hill SOW Section 3 – Tank Upgrade Alternatives (TUA) Scoping
Meeting Summary
12/3 – 12/4/2015

Attendees:

- NAVY/DLA:
NAVFAC PAC: Perry Nakaoka, Stephen Fujino (Section 3 Lead), Debbie Loo, John Sato (Section 8 Lead)
HDR, Prime Contractor: Frank Hino
Enterprise Engineering Inc., EEI, Subcontractor to HDR : Kevin Murphy-Principal, Steve DiGregorio, Steve Brooks, Doug Kieley
NAVFAC EXWC: Terri Regin (Section 2 Lead), Leslie Karr, Miguel San Pedro, Mike Rocha, Frank Kern, Tom Tehada (Section 5 Lead)
NAVFAC Hi: Jimmy Miyamoto, CDR Burr Vogel
NAVSUP FLC PH: John Floyd (Section 4 Lead) [12/2], Greg Yamasaki, LCDR Lovgren [12/2-afternoon only, 12/3],
NAVSUP Energy: Danae Smith
DLA: Elton Saito, Ron Nelson, Bob Krouse,
- EPA: Steve Linder, Omer Shalev;
Consultants: Doug Schwarm, Phil Myers [At Red Hill 12/2, came at 1015]
- DOH: Stuart Yamada, Steven Chang, Roxanne Kwan, Josh Nagashima, Roy Ilaga, Jenny Bernier, George Tabil, Thu Perry

Introductory Session:

The introductory session focused on Overall Expectations and Goals for Section 3 Tank Upgrades Alternatives and defining success for the session. The discussion was structured around the following topics:

a. Extraordinary Outcomes

- Definitive outline for the SOW,
- Understand expectations
- Common knowledge, basic understanding of issues (level playing field)
- Get through the agenda
- Open discussion, input from ALL stakeholders
- Agree 100% on initial screening criteria
- Agree 80% minimum level on what the upgrade concepts will be, fringe ones in parking lot

b. Challenges

- Entrenched decisions: Lot of work was done prior to this meeting, need to come at this with fresh eyes; allow ideas for re-work [No one set solution, both ways: have to *have* secondary containment, even if not technically feasible OR too costly to do X alternative]
 - Overcome personal bias
 - Hidden Agendas

- Establishing the fundamental criteria in order to make a good decision on the alternative (after report is done), how are we going to judge between the alternatives
- Sheer disparity between technical levels of expertise in the room (opinion or strict engineering/science issue)
 - Level playing field

c. Processes

- Don't interrupt, let someone explain full alternative, then bring up new options
- Decision-making matrix, weighing values of the variables between the agencies (public acceptance versus cost), so coming to consensus of the values
- Active listening
- All left with common knowledge and understanding

d. Facilitator's Role

- Pull input from those not speaking
- Small groups/side bar: Group provide the topics
- Less time in small groups

Review SOW Expectations for Section 3: EPA

The EPA stated that the expectations of Section 3 are to identify the BAPT and the TIRM procedures that can be applied to these tanks. The *Red Hill Storage Facility Tank Upgrade and Release Detection Systems and Tank Tightness Testing Report by EEI dated July 2015* is only one component for final decision, because the decision must also consider the TIRM procedures that are needed based on the upgrade, and then the corresponding RDS and corrosion outcome. TIRM may need to be updated based on decision of BAPT. Later discussions focused on Section 3 would and the need to include input from other sections, specifically Section 2 (TIRM), Section 4 (Release Detection) and Section 5 (Corrosion and Metal Fatigue Practices). EPA feels Section 3 should incorporate recommendations from the other sections and the Navy/DLA agrees.

The following points were made by the EPA during this discussion:

- 1) After this meeting and possibly additional scoping meetings, the next deliverable is a scope of work. The next deliverable is not finalizing the report that was contracted by Navy/DLA with EEI.
- 2) The deliverable needs to meet conditions: timeline and that it is truly BAPT understanding the 'Iron Triangle' constraints: costs/MILCON, schedule, & quality
- 3) Components of BAPT must consider Sections 2, 4, and 5 reports will also be available when making the decision for BAPT.
- 4) Different levels of BAPT, what if it never gets funded? Navy/DLA under the 22-year time constraint, the negotiated time period considered the risk of funding.
- 5) EPA is looking for: Feasibility (Can it be done?) Practicability (Can it be done cost effectively.)
- 6) If we are not in agreement after this Scoping Meeting and a second meeting is required that is acceptable.

Overall Expectations and Goals for Section 3, Defining Success

See Introductory Session, above

Key Background Documents and Summary of Previous Efforts – Navy

EEl presented a summary of the previous documents and work performed at the facility.

- 1) 1997 – Upgrade of Red Hill, Tank 19: EEl completed this study which was contracted by the Navy to develop ideas for tank upgrades.
- 2) 2008 – Update to the 1997 Tank 19 report, and expansion to Upgrade of Red Hill Tanks (with fundamentally similar findings)
- 3) 2008 – Market Survey of Leak Detection Systems for the Red Hill Fuel Storage Facility, Michael Baker Jr. Inc

Discussion Points:

- 1) 2006: Tank 48 release – 359,000 gallons diesel release, lots of focus on FLC Pearl Harbor, then more focus on environmental matters and security Tank 48 is located at Pearl Harbor Naval Base, and is not at or similar to Red Hill.
- 2) Tank 19: had failure problems, fuel coming back through the wall, so took this tank down. DLA stated that the knowledge of the failure was second hand.
- 3) Service life of the tank: no known records. The public perception is that the tank are old and beyond their service life. EPA made the comment that there is no established service life for these tanks. EEl discussed that the concept of service life is used to obtain funding.
- 4) FLC has API 653 inspection reports of tanks from 2000 (about) to present

Presentation on Enterprise Engineering, Inc. (EEl) Report/Work on Tank Upgrade Alternatives and associated release detection - Navy

The Navy contracted EEl in March 2015 to perform a study of Red Hill Fuel Facility Tank Upgrade Alternatives and Release Detection and Tank Tightness. EEl made a presentation of the current status of the contracted study. The process of the study was described, initial brainstorming, initial screening and development of attributes for evaluation of alternatives. EEl's initial scope of work with the Navy did not include developing a ranking system or ranking the alternatives. Refer to Attachment 1.

Discussion points:

- 1) EPA asked, How far is the Navy looking at the alternatives? What sources were consulted?
 - a. The Navy discussed depth of alternatives and sources consulted. EPA commented that documenting information sources is very important.
- 2) EEl's In Progress Report: Comments to the report. The Navy and EEl are working on responses to the In Progress Report comments.
- 3) Next Deliverable: Scope of Work that is agreed upon during scoping meeting(s). The Navy/DLA and EPA/DOH agreed to an interim discussion prior to final submission.
- 4) EEl's Preliminary Report is similar to the AOC SOW, but some differences exist with the AOC SOW Section 3.3
- 5) List of available technologies that EEl considered
 - a. There was a discussion specifically concerning Navy Research Laboratory coatings and thermal spray aluminum (metalizing) put on many tank bottoms throughout DoD and a few at Red Hill to control corrosion.

- b. Discussion on aluminizing drawbacks: The result can be porous, so there is a need to provide a coating over system of the aluminizing. EEI also expressed concern about the heat input onto the steel during the metalizing process.
- 6) List of Initial Screening Considerations that EEI considered: factors used to select which alternatives to fully investigate (See **BAPT Evaluation Process and Methodology**)
- 7) List of Evaluation Attributes: to identify common elements and differences between each alternative (See **BAPT Evaluation Criteria/Attributes for Feasible Alternatives**)
 - a. Assumptions related to the condition of the current infrastructure need to be clearly identified to be able to make decision under TUA.
 - i. For single-wall, then need to do a higher level quality TIRM
 - ii. For double-wall, what is acceptable level of inspection of outer tank – can water leak into secondary containment or no because path to leak out; less effort for repair, no coating, etc.
 - 1. How do we engineer beyond this, so that we can test for corrosion or prevent water from coming in? What is acceptable level of effort?
 - b. Identified limitations within Red Hill in order to install leak detection in the tanks & repair/restoration/upgrade of this magnitude:
 - i. Dedicated fiber optic cable for the tank upgrades/leak detection
- 8) More electrical power transmission needed to actually get this work done

BAPT Evaluation Process and Methodology – Feasibility Criteria

The purpose of the Initial screening criteria was to remove alternatives that were not practicable. The group discussed the need to expand on the explanation of each screening criteria, specificity of the language and agreed to suggested descriptive changes.

- 1) Constructible: Can be constructed in the field at Red Hill using practicable construction means and methods.
 - a. Do not want Red Hill to be a science project
 - b. Example: 100' liner to get through tunnel into the tank (probably not practicable)
- 2) Testable: Can be tested and shown to be acceptable during construction and startup/commissioning; verified to perform in accordance with design requirements.
 - a. Can you provide contractor QA/QC?
 - b. Is there an industry acceptable practice on what constitutes commissioning?
 - c. Will this hold product?
 - d. Example: Exterior tank upgrades, inject grout outside of the tank and concrete structure – removed from further detailed study because a test cannot be performed to verify that all voids are grouted.
- 3) Inspectable: Able to determine integrity on a periodic basis either while the tank contains product or out of service, i.e. no product in the tank.
 - a. Once it is in use, can you determine its integrity?
 - b. Secondary containment plate system with concrete can be inspected when out of service, or partially inspected, and this alternative should be kept in consideration for further detailed study.
- 4) Repairable: Able to be repaired in the field at Red Hill using practicable construction/repair means and methods.
 - a. Can this be fixed?

Discussion Points

- 1) In the report, need to state the selection criteria reasons when explaining why alternatives were not moved forward.
- 2) Need for specialized skills identified by EPA as a possible attribute.
- 3) Assumptions about current condition of tanks identified by EPA as a possible attribute
- 4) Restorability or reversibility identified by EPA as a possible attribute; does an action preclude other alternatives in the future?

EPA/DOH called for a caucus to privately discuss the EEI's initial screening process. After the caucus, EPA/DOH concurred with the 4 initial feasibility criteria, with additional wording/slight changes (i.e. practicable vice traditional)

BAPT Evaluation Criteria/Attributes for Feasible Alternatives – EEI

The purpose of the evaluation criteria was to remove alternatives that don't work. The group discussed evaluation criteria that will be presented in the TUA Report in order to select the BAPT. EPA requested that the Navy add a level of granularity to each attribute, i.e. provide a ranking for each attribute. The purpose of this ranking system is to evaluate various alternatives and their relative performance to each other. This will aid the decision makers in selecting the BAPT. The ranking system should:

- a. Try to reduce the use of yes/no; acceptable/Not acceptable
- b. More rankings: 1-5; high, medium, low; etc.
- c. Narrative (explanation) to validate the ranking

The following attributes were discussed. The group concurred with the following attributes and with the understanding that a more robust definition would be developed.

- 1) Current attributes:
 - a. Primary positive attributes: summarize the pros of each alternative
 - b. Primary negative attributes: summarize the cons of each alternative
 - c. Constructible and Testable: How constructible/testable is the alternative? How well construction performs?
 - d. Inspectable and Repairable: How inspectable/repairable is the alternative?
 - e. Release Detection System Testable: Can release detection be included in this alternative?
 - f. Secondary containment: Does the alternative provide secondary containment?
 - g. Successful implementation at preventing leaks at large fuel depots
 - h. Impact on operating requirements: High, medium, low
 - i. Replaces Operating requirements and procedures
 - i. Impact on maintenance requirements: High, medium, low
 - i. Replaces maintenance requirements and procedures
 - j. Ability to identify the release location
 - k. Ability to identify the release quantity
 - l. Future maintenance and integrity requirements
 - i. different levels of life expectancy and inspections to maintain system
 - m. In-tank release detection system, If required
 - i. If it is a single-wall system, there must be a release detection method implemented per new regulations
 - ii. If it is a double walled tank, it's not required to have in-tank release detection system. LDS means third party certified, NWGLDE

- n. Release detection system in the interstitial space between inner and outer tanks (If applicable)
 - i. Ground Water /vapor monitoring wells can be considered as ‘outside primary release detection’ and this is NOT what we want implied.
 - o. Apparent Reliability: Abused word, intent was some element of decision-making process on credibility; still need to develop a better definition of what this means; general consensus of time based failure rate;
 - i. Response options: high/low acceptability, unknown,
 - ii. **Parking Lot** – on definition and if keeping this attribute in or not
 - p. Ability to repair failures: level of difficulty to execute the repairs
 - q. Service life limitations: relative situation: short-1 year, long-40 years
 - i. Replaces design or anticipated service life
 - r. Impact on volume
 - s. Impact on existing ATG
 - t. Impact on venting
 - i. venting when filling/emptying the tanks is very serious at Red Hill; engineering perspective may prevent alternative because of the additional venting requirements that cannot be met
 - u. Impact on tank nozzles (vice piping): different difficulties with replacing the nozzles based on each alternative
 - v. Costs
 - i. Costs provided in the report need to take into account that all the tanks will be upgraded in the time constraint of 22-years.
 - ii. List assumptions for developing costs in report: 3 tanks, 2 shifts, 6 working days
- 2) New Attributes:
- a. Ability to stop/reduce the leak/release from going into the environment
 - i. Ability to minimize the magnitude of a leak
 - b. Success of construction
 - c. Restorability:
 - i. Can it be undone at the next service life? How difficult is it to remove/restore or turn into something else [i.e. metalizing or steel overlay – can this be undone or is tank completely done at end of service life of this upgrade?]
 - d. Construction logistics: Noise, traffic – buses for workers, equipment movement, staging areas [Impacts to the community]
 - e. Potential for probability of success
 - f. Proprietary
- 3) The following attributes were deleted by the group:
- a. Environmental compliance requirement
 - i. It is understood that the alternatives would meet environmental regulation.
 - b. Is concept practicable? EEI believes this synthesizes the process in the report, EPA says it’s not just standalone evaluation on each alternative, but when looking at all the alternatives as a whole.

- i. What is best available and practicable alternative? This is part of decision-making process, not an attribute.
 - ii. Incrementally what level of risk is being reduced for the costs associated with the alternative (Minimal risk reduction for highest cost – not practicable)?
 - c. Stakeholder Acceptability, various stakeholders [cannot realistically address this properly in the report]
 - i. Community/Public Acceptability
 - ii. Politicians
 - iii. SMEs
 - d. Execution years: How long would it take to construct this alternative? Labor hours per option; construction cost estimates are not done by labor hours; could be done in square/ft; will be a hard metric to develop.
 - i. EEI will not be able to develop the execution years per alternative in this report due to construction contracting uncertainties.
- 4) **Parking Lot Attributes:**
- 1. All release detection attributes
 - 2. Reliability

Alternatives to be included in Scope of Work – EEI

The following discussion is concerning the specific tank upgrade alternatives to move forward. EPA/DOH concurred the 14 alternatives presented are the right alternatives for consideration. After some discussion, EPA proposed a Second Tier Screening process be applied to the 14 alternatives and the following alternatives were recommended by the group to move forward with in the SOW.

The alternatives selected to move forward consist of three (3) single wall alternative and three (3) double wall alternatives. Note: Double wall is defined as having secondary containment.)

1) Single Wall Alternatives to be included in SOW:

- 1A, Restoration of Existing Tank with improved TIRM Procedures
- 1B, Restoration of Existing Tank Plus Interior Coating
 - i. What is our level of confidence that no holes during the welds? Our confidence lies with the TIRM procedures, based on what scanning technology, destructive testing,
 - ii. TIRM report really dependent on making a decision about 1A & 1B.
- 1E: Replace all existing steel liner (remove existing) with all new steel to start at age zero (i.e. no pitting on the back of the steel)

2) Double Wall Alternatives to be included in SOW:

- 2A: Composite Double Wall Tank (Carbon Steel)
- 2B: Composite double wall tank (duplex stainless steel). Will have to consider the grades available.
- 3A: Tank within a Tank (Carbon Steel)
 - i. If strongly consider No. 3, then can consider 3B also.

Additional Discussion:

- 1) Second tier screening evaluation process that explains why these alternatives were kept or removed from the decision making meeting.
 - i. Goal: At decision meeting, only have a few alternatives to choose from
 - ii. Need detailed explanation why alternatives were NOT included
- 2) Does the project have to adhere to the Buy American Act?
- 3) What alternatives were removed by the Second Tier screening process? These alternatives were removed with input from the entire group. The report will have to provide further justification.
 - 1C: Restoration of existing tank plus Metalizing (Interior Coating) on Existing Steel Liner
 - 1D: Rubber lining bonded to existing steel liner
 - 3B: Tank within a Tank (Duplex Stainless Steel): to remove the noise, since similar to 3A, but can still see back side
 - 4: Double Wall Fiberglass System with Release Detection – not backed up with sufficient engineer data
 - 5A: Steel liner plates welded to existing steel liner
 - 5B: Steel liner plates with expanded metal between existing steel liner and new steel liner
 - 6: Stainless steel membrane over existing steel liner: requires robot to put in the tank, will technology even be able to build it, bubbling from external pressure/slight vacuum, that big and thin will buckle
 - 7: Flexible membrane liner, not bonded to steel liner – lifetime unknown (one test for 11 years, no data going beyond the date, possible life is 10 years), cannot strap the tank (huge operational/inventory issues), nothing done at this size, Bag would weigh several tons and try to construct/support within tank, plastic-chemical variability (time and brittle)

Meeting Adjourned to be continued 12/3/2015

The following summarizes the discussion prior to returning to the agenda.

- 1) Summary of yesterday's events - Navy
- 2) Outline Section 3.2 Scope of Work Content – EPA
 - a. Upfront info/data that helped inform decision/summary of data for 10-20 years: what have been the failure modes, what we know of past leaks/failures. This is a Navy initiative and there was discussion on availability of the data prior to 2000.
 - i. EPA/DOH will work with EPA Consultant to determine what data he is looking for.
 - ii. Include in the report, the actual documents that were used (where appropriate) and, insert document names and the format the docs will be given to EPA/DOH in outline – electronic, hard copy, database, on shared website
 - b. Overall alternatives (technologies) section: Include sources that were consulted (appendices with references),
 - c. Initial screening criteria discussed and clarified
 - d. Second screening criteria established resulting in a short list of alternatives to focus efforts on

- e. Describe attributes, assign some type of ranking, (granularity), examples - value of quality contractor – good, ok, bad; binary attributes: true/false,
- f. Reflect info in summary table with supporting documentation/data,
- g. TIRM: How does it affect operations, level of confidence in repair, etc.
- h. Release detection systems: Identify alternatives compatible with each of the TUA.

3) Discussion

- a. Timeline for AOC/SOW development: Navy targeting a draft outline by end of January.
- b. Provide in-depth analysis for the alternatives selected, provide details in order for decision-makers to decide which alternative is best
 - (1) When talking about single-walled solutions, need to include the operational response. If a release is detected, then what actions are to be taken to minimize or even stop the release, i.e. move fuel to another tank?
 - (2) Alternatives 1A, 1B: How extensive verification for TIRM to reduce risk. This is in TIRM report, includes the improvement for processes, but may have multiple 1As to increase the reliability of the TIRM, i.e. third party QC/QA, double welding, coating, destructive testing ranges (5 plates per area in tank versus 10).
- c. Single-shell, very clear idea of what the TIRM procedure is; if double-walled – what does the TIRM procedure look like, and need more detailed version for the upgrade alternative
 - (1) EPA wants to be able to justify to stakeholders if a single-wall alternative is selected instead of secondary containment alternative. EPA needs to be able to justify that the single-wall alternative is more robust than the secondary containment option based on the data in the report.
- d. Provide a report that outlines the effectiveness of each of the systems (including leak detection, corrosion, and tank upgrade/secondary containment), so can make a choice on the actual system that will be going into each tank.
- e. Look at all the variables for the report. The scope of work that is being done is fairly comprehensive, and needs to take into account the other reports, some risk elements, etc.
- f. Granularity of the alternatives, so various costs based on how much you do in TIRM: coatings, double welds, tightness testing frequency, range of options and costs associated with alternative 1.
- g. Life cycle cost analysis – EEL's current contract does not include this; so will need to add.
- h. Are we doing more or less than what industry is doing? If less-unsatisfactory; if more – then should be identified in detail, need to write out the procedures

Alternatives to be included in Scope of Work (continued)

BAPT Components – identify components of the alternative that will be described in the TUA Report in order to select BAPT (e.g., upgrade technology and corresponding TIRM and leak detections procedures). In addition to what is developed in Section 3, the BAPT will be a compilation of input from data developed in Sections 2, 4, & 5 reports and possibly new data to help inform the decision; i.e. Destructive testing: If done now, then this could better help the TUA document.

QA/QC Report Requirements

- 1) There are two separate and distinct QA/QC concerns.
 - i. QC of the auditability of data and information that EEI is basing their report on, how the testing was done (if testing is performed) and clear audit trail to any reports, technical information, telephone calls or other data referenced in the Section 3 report.
 - ii. The actual level of CONSTRUCTION QC/QA for the alternatives.
- 2) Components EPA wants to see in QC
 - i. Auditable trail of data collection
 - ii. Methodology in reviewing vendor claims
 - iii. Limitations to the data
 - iv. Owner/Operator input/experience from other similar tanks (don't just rely on vendor claims)
 - v. Don't insist on new methods/technologies in QC/QA. Stick with what is proven.
 - vi. Develop/discussion of TIRM for particular alternative – make sure work with EXWC and use specifications
 - vii. QC: will be a part of every alternative considered, so need to be a part of evaluation and cost factors to analyze the options

Action Items and Next Steps

15 January: EPA/DOH will provide any additional attributes they think should be included in this outline

End of January: Navy targeting a draft outline to include an example of attributes table in the report.

Parking Lot Issues:

- Attributes (evaluation criteria for feasible alternatives) that were tabled: 1) All release detection and 2) Reliability
 - i. Possibly put in Section 4 – what operations currently exist at Red Hill that are even better than industry standard.

Additional Discussion on Baseline Condition of the Tank (Not included in Section 3)

The following discussion was not part of Section 3 and is for record only. Further discussion is required to identify which AOC SOW section will capture this information.

- 1) Baseline condition of these tanks for each tank (repairs, problems-causes); Summary of known past failure modes for the last 10-20 years: i.e. pits/cracks/types of spills.
 - a. EPA/DOH wants to see a summary of all the data, not just the reports; a baseline story. What is the current condition of Red Hill based on facts?
 - b. Do NOT put a judgment value; just state the history/facts
 - c. EPA wants to see this by mid-January. Navy cannot complete this by that date and will continue discussion with EPA/DOH.
 - d. Discussion on where does this information get presented. It is not part of the TUA. Possibly Section 2 but it is not currently required by the AOC SOW.
- 2) What is the existing documentation that Navy can provide?
 - Modified API 653 Reports: detailed info of each tank – can provide these reports to explain overall material condition assessment of the facility (ex.

Nozzles are a problem, recognize through our formal inspection that this is a known issue) - Navy will provide these reports and summary of the reports

- Operational Issues - Navy will continue discussion with EPA/DOH.
- Incidents (releases) and the causes of the releases. Explain that releases are not because the tanks are old and leaking.
 - a. Navy provided that Telltale system caused most of the leaks, so removed these systems (made a systemic change; get credit for it)
 - b. 1998, Willbros Report lists a spill history that is unfounded. EPA/DOH wants the Navy to refute/explain this spill history.

Red Hill Administrative Order of Consent Scoping Meetings
Red Hill SOW Section 8 – Risk/Vulnerability Assessment (RVA) Scoping
Meeting Summary
12/3 – 12/4/2015

ATTENDEES:

Navy/DLA:

- NAVFAC PAC: John Sato (Navy Lead); Kris Saboda, Debbie Loo, Karen Sumida
- NAVFAC HI: CAPT Tufts (12/3), CDR Vogel, Jimmy Miyamoto
- NAVFAC EXWC: Leslie Carr, Tom Tehada (Section 5 Lead), Miguel San Pedro, Mike Rocha, Frank Kern
- NAVSUP FLC PH: John Floyd (Section 4 Lead), Tom Williams, Greg Yamasaki
- NAVSUP Energy: Danae Smith
- DLA: Bob Krouse, Elton Saito, Ron Nelson
- Moderator, Ventura Consulting: Neal Flesner
- EEI (12/3 only): Steve Brooks, Kevin Murphy, Doug Kieley

EPA: Steve Linder, Omer Shalev, Bob Pallarino (12/4)

EPA Consultants: Doug Schwarm, Phil Myers

DOH: Stuart Yamada, Steve Chang, Roxanne Kwan, Josh Nagashima, Jenny Bernier

SOW Sect 8, states, “this Section is to assess the level of risk the Facility may pose to the groundwater and drinking water aquifers and to inform the Parties in subsequent development of BAPT decisions.”

**1. DISCUSSION / DECISION POINT 1 – RISK/VULNERABILITY ASSESSMENT
METHODOLOGY AND APPROACH**

Discussed the overall risk/vulnerability assessment methodology and approach along with the associated expected outcomes. Navy presented the proposed methodology and approach. The proposed methodology assesses various scenarios of risk, as a function of: likelihood of occurrence, effectiveness of systems, and consequences. The scenarios and inputs will be developed with stakeholders after initial data gathering.

Navy presented a dry run on methodology

- Methodology follows Sandia National Laboratories approach, who is the DOE Lead Laboratory for physical security research and development.
- Risk equation: $R = PA * (1-PE) * C$
- R: Risk, PA: Likelihood of Occurrence, PE: Effectiveness of Systems, C: Consequences. This methodology has been used for similar assessments.

EPA is supportive of this approach because it is an objective methodology. EPA recommended that the equation be broken into 2 separate equations to separate 1-PE and PA. Risk is assessed with the PA factor. Then risk management and mitigation evaluated with the 1-PE factor.

After further discussions on inputs to the risk equation, the process was summarized as:

- Step 1. $R = PA * C$
 - Includes identifying possible causes of leaks, and likelihood of occurrence of various spill sizes, and those releases getting to the groundwater or to drinking water.

- Includes identifying maximum, credible release, and associated consequence.
- Need to work on what is the risk threshold that would require action be taken to make the system more effective.
- Step 2. $R = PA * (1-PE) * C$
 - This step incorporates effectiveness of the system.

2. DISCUSSION / DECISION POINT 2 – INPUTS TO BE USED FOR THE METHODOLOGY

Discussed information needed for input to the assessment methodology. Identified limitations and assumptions.

Discussion on types of data that will be needed included:

- How are tanks, nozzles, piping, storage, automated systems set up at Red Hill.
- What are the facility components critical to drinking water and groundwater vulnerability at Red Hill
- What are likely scenarios/incidents (e.g. natural disasters, operational incidents, maintenance/repair scenarios)
- Historical failures
- Detectable quantity and duration of a leak. Discussed monitoring of level of fuel in tanks during static and dynamic operations.
- Where would leaked fuel go, hydrogeology
- System redundancy
- Management controls, operation and maintenance (e.g. tank tightness testing).

Will need to develop scenarios and consequences (C) table, with relative numeric impact level for different scenarios. Some potential consequences:

- Fuel leaks out of the tank
- Fuel reaches groundwater. Would make technical assumptions for vertical migration rate.
- Contaminants reach groundwater action level
- Contaminants reach drinking water maximum contaminant level (most important)

Potential scenarios may include different categories for quantities or impact of release. Navy considers “release” to mean release into the geological formation.

Risk management. How do we improve our risk?

- Reduce likelihood of occurrence (PA)
- Increase effectiveness of systems (PE)
- Identify concerns of risk to: People, Environment, Assets, Reputation, Public Health.

Navy/DLA considers that the assessment will assess the risk/vulnerability associated with the current configuration of the facility. EPA wants this to show where those vulnerabilities are and how they are being mitigated. Identification of vulnerabilities needs to be semi-quantitative.

Relocation of Red Hill will need to be a qualitative analysis. Consider whether relocation transfers risk to others.

All acknowledged some information in the risk/vulnerability assessment will not be releasable for national security reasons. Executive Summary of final report can be released if it does not contain this type of sensitive information.

It was recognized that the Navy/DLA has proceeded with improvements to Red Hill. These improvements will be incorporated in the risk/vulnerability assessment of the current Red Hill configuration.

Comments in the Board of Water Supply letter of 3 Dec 2015 to DOH, EPA and NAVFAC Hawaii with respect to the risk/vulnerability assessment will be considered for incorporation in the risk/vulnerability assessment approach.

3. DISCUSSION / DECISION POINT 3 – SCHEDULE

Discussed schedule drivers and how Section 8 fits within the AOC and the other Sections.

It is recognized that updated data may be available after reports for other AOC/SOW Sections are completed. However, waiting for these reports may delay the schedule. The stakeholders will continue to assess appropriateness of revising the risk/vulnerability assessment as more information becomes available.

4. DISCUSSION / DECISION POINT 4 – ADDITIONAL SCOPING MEETINGS

Discussed if additional scoping meetings are needed and what information is needed for those meetings.

The Navy/DLA will consider contractor support for developing a risk/vulnerability assessment with appropriate expertise in Quantitative Risk Assessments at petroleum depots. The Navy/DLA will also consider a multi-phased approach. First phase would be to develop a Work Plan for the development of the risk/vulnerability assessment, including methodology, data requirements, and data collection efforts. Second phase would be to implement the Work Plan. The Work Plan would support the Scoping task for Section 8 of the AOC/SOW.

Action Items:

- Navy/DLA develop Acquisition Strategy and draft scope of work for contract award.
- Hold conference call to discuss with parties scheduled through the project coordinators.

Red Hill Administrative Order of Consent Scoping Meetings
Red Hill SOW Sections 6 & 7 – Investigation & Remediation of Release,
Groundwater Protection and Evaluation Scoping Meeting Summary
11/30 – 12/4/2015

[Items Revised per Outcome of Teleconference Held on December 10, 2015]

ATTENDEES:

Navy/DLA:

- NAVFAC PAC: Kris Saboda, Bruce Tsutsui
- NAVFAC HI: CDR Vogel, Jimmy Miyamoto, Aaron Poentis, June Shimabuku, Janice Fukumoto, Joel Narusawa, Tracy Saguibo, Raelynn Kishaba, Brian Fukuda,
- AECOM: Frank Cioffi, Jeff Johnson, John Thackston, Margie Thach, Jack Kronen
- DLA: Amanda Manó'i
- Moderator: Bharti Ujjani

EPA: Tom Huetterman, Bob Pallarino, Don Bussey

DOH: Rich Takaba, Robert Whittier, Shunsheng Fu, Joanna Seto

DOH Consultant/UH: Donald Thomas

DLNR/CWRM: Patrick Casey (11/30), Robert Chenet (11/30)

The following are the major preliminary agreements and action items from scoping meetings held during the week of November 30, 2015 and on Thursday, December 10, 2015 among the Parties identified in the AOC to discuss requirements to fulfill SOW Section 6 (Investigation and Remediation of Releases) and SOW Section 7 (Groundwater Protection and Evaluation) of the AOC. A Preliminary Work Plan/Statement of Work Task List for AOC SOW Section 6 and Section 7 was preliminarily agreed upon and is presented in Attachment 1. Presentation slides with additional information were used in scoping sessions during the week of November 30, 2015 and are presented in Attachment 2.

Agreed-Upon Items: Agreed-upon items were reviewed and discussed further among the Parties in a teleconference on Thursday, December 10, 2015 from 1100 to 1300.

1. Key objective is the protection of the groundwater resource.
2. The complex geology of Red Hill presents limitations on the practical options for investigation and removal of NAPL.
3. In addition to performing Task 1, Geological Mapping, use existing site data and previous investigations to refine the existing conceptual site model and to focus future work.
4. Combine Sections 6 and 7 Work Plan/SOW and complete within 90 days from determination of final scoping meeting. Revise schedule per AOC Section 8.
5. The Work Plan/SOW will include a section that provides a detailed summary of the site background and history.
6. Potential offsite contaminant sources utilizing DOH's information repository will be identified in the Work Plan; however, the Navy is not responsible for investigating or cleanup of other non-Navy, point sources.
7. The Work Plan/SOW will provide a detailed justification/evaluation of potential NAPL investigation methodologies, and document why those are not being pursued at this time. None of the methods discussed for investigating NAPL are currently recommended due to the complexity of the subsurface geology, site constraints, and the low likelihood of producing actionable data.

8. Additional drilling and intrusive work for the purposes of locating NAPL at the tank farm is not proposed at this time.
9. Chemical analyses of the groundwater for this investigation will use SW-846 methods (consistent with methods used in the long-term groundwater monitoring program).
10. The following natural attenuation parameters will be analyzed at the laboratory or in the field, as specified in the Work Plan/SOW: sulfate, nitrate, ferrous ion, dissolved oxygen, methane, and chloride.
11. The Work Plan/SOW and Report will evaluate the existing soil vapor data. No new soil vapor data collection for the current investigation is proposed. At this time, no changes to the existing soil vapor monitoring program are proposed. This task will be coordinated with the AOC SOW Section 4 team for further evaluation.
12. Based on currently available data it is anticipated that the following chemicals of potential concern (COPCs) may be evaluated in the modeling: TPH-G, TPH-D, TPH-O, Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene.
13. The final report will reevaluate the appropriateness of all the assumptions and whether they still hold true upon completion of Work Plan/SOW activities.
14. The locations of four initially proposed monitoring wells (i.e., RHMW08 through RHMW11) are acceptable and will be installed as part of the current investigation. Their use and adequacy as sentinel wells will be evaluated in the final report.
15. The proposed wells will be installed prior to the refinement of the groundwater model. The final report will evaluate whether additional wells are needed to fill data gaps. Specifically, the following will be evaluated:
 - a. Whether an additional well is recommended between proposed well RHMW-08 and the Red Hill Shaft
 - b. Whether RHMW07 is appropriate for retention in the monitoring grid
 - c. Whether RHMW04 provides groundwater quality data representative of ambient background conditions, and whether or not any additional data/well are needed
16. The Navy intends to cooperate with the University of Hawaii on data collection efforts from Navy monitoring wells for their regional groundwater studies which may provide additional data that could supplement the existing CSM developed for Red Hill.
17. The existing groundwater flow model prepared in 2007 will be updated utilizing the same software platform (i.e., MODFLOW) incorporating historic, current, and future data. As part of the update, a sensitivity analysis will include evaluating the potential effects of hydraulic barriers associated with the caprock formation and other lower permeability volcanics (i.e., Honolulu Volcanic Series, saprolite, valley fill), and various hypothetical pumping rate scenarios.
18. Communication during the model development will be performed at regular intervals in addition to the deliverables specified in the AOC SOW (i.e., progress reports) to ensure the model is being developed for its intended purpose.
19. EPA to provide additional information on the Desktop Catchment Water Model as a potential resource/tool.
20. Preliminary remedial alternatives will be identified in the Work Plan/SOW, and discussed and evaluated in the final report. Future potential releases will also be considered (e.g., response to catastrophic releases). Coordinate with Section 8 team.
21. Final report will include an initial screening of alternatives followed by a more detailed evaluation of select remedial alternatives.
22. Conceptual site model to evaluate potential vadose zone flow mechanisms and degradation.
23. Contaminant fate and transport modeling to be performed as presented during the scoping meeting (e.g., based on the existing fate and transport model).
24. The seven tasks presented in the scoping meetings are sufficient for the Work Plan/SOW.

25. There are progress report deliverables under AOC SOW Section 7.1.2 for the groundwater flow model to be provided to regulatory agencies every four months following approval of the Sections 6 and 7 Work Plan/SOW. An evaluation of whether to perform a tracer study will be included in a progress report deliverable following monitoring well installation and receipt of initial groundwater gradient and chemical data.
26. Navy will propose a new target analyte list and sampling schedule for the AOC SOW Section 6 and Section 7 investigation in the Work Plan/SOW for regulatory review. Any revisions to the current groundwater long-term monitoring program will be proposed and evaluated in the Groundwater Monitoring Network Report (Section 7.3.3 of the AOC SOW).

Action Items: Action items were discussed further among the Parties in a teleconference on Thursday, December 10, 2015 from 1100 to 1300.

1. Navy to consult Counsel to ensure that the scoping meeting materials are appropriate for distribution (e.g. do not contain procurement sensitive information, critical infrastructure information, etc.).
2. Regulatory agencies, in coordination with the Navy, to contact Board of Water Supply to obtain information regarding plans for future drinking water source well(s) in the vicinity of Red Hill, specifically location and pump demand (i.e., production rate).
3. Project coordinators to take steps to modify the AOC SOW schedule to reflect one Work Plan/SOW covering both Section 6 and 7 delivered within 90 days of determination of final scoping meeting.
4. Regulatory agencies, in coordination with the Navy, to request Halawa Shaft pumping rates to provide additional data for the groundwater model.
5. The Navy, with regulatory agency assistance, will request from the Water Commission well construction information on the Halawa Shaft and Red Hill Shaft.
6. The Navy will follow up with DOH on additional LUST and well log information for Halawa Prison and Hawaiian Cement.
7. Regarding all proposed tasks to be included in the Work Plan/SOW, Navy will estimate and evaluate task durations for AOC schedule feasibility.
8. Propose a preliminary scope of work schedule. Example, determine whether to complete the geologic mapping prior to advancing the wells.