Red Hill Bulk Fuel Storage Facility Informational Briefing

Honolulu City Council
Committee on Public Infrastructure, Technology and Sustainability Meeting
January 23, 2019
Today’s Discussion

- Review BWS understanding of data and information to date
  - Navy proposed Tank Upgrade Alternative (TUA) Way Forward
  - Tank 14 coupons
  - Interim groundwater model report
- BWS support of Council Resolution 18-266
Schematic Chart Showing Oahu’s Water Sources

- Sea Level
- Zone of Fresh Water
- Zone of Mixture
- Artesian Basin
- Zone of Salt Water
- Dike Zone
- Evaporation
- Precipitation
- Run-Off
- Dike Tunnel
- Inclined Shaft
- Deep Well
- Artesian Well
- Artesian Basin
- Zone of Mixture
- Zone of Salt Water
- Ocean
- Caprock
- Sea Level
Council Resolution 18-266

• Urges EPA and DOH to reject a single walled tank upgrade for Red Hill
• Cites concerns with
  • Rust on the backside of the existing steel liner
  • Proposed TUA way forward before regulatory agency review of the data and completion of all studies
  • Interim report suggesting that a 700,000 gallon release would not cause any impacts to Navy’s Red Hill Shaft.
• Resolution 18-266 expresses the Council’s viewpoints and position on Red Hill
Secondary containment affords the best protection from leaks both large and small.
Concerns with Resolution 18-266

- Resolution appears to undermine the regulators and the step by step, science based process of the Administrative Order.
- Appears to rely on information that is not accurate.
- Tests confirm tanks are not leaking. Steel linings inspected to confirm tank integrity.
- Other protections in place environmental testing, soil vapor testing, monitoring wells, etc. to affirm Red Hill tank integrity.
- Steel lining NOT worse than anticipated.
Red Hill Facts

• Oahu’s sole-source groundwater aquifer provides critical drinking water supplies and cannot be replaced.
• Enormous amount of fuel stored 100 feet over a major drinking water resource.
• Petroleum chemicals detected in groundwater and rocks underneath the tanks.
Groundwater Contamination underneath Red Hill Tank at RHMW02 as of July 2018 (2018 Q3)

- TPH-d (ppb)
- TPH-d DOH EAL Gross contamination
- TPH-d DOH EAL DW Toxicity

Key Dates:
- 7/29/08
- 10/22/08
- 1/15/14
- 4/20/15
- 4/7/14
- 7/13/10
- 1/20/16
- 4/24/18
- 7/24/18
- 10/23/17

Date Range:
- 9/20/2005 to 9/20/2017
Tank 14 Coupon Inspection

- Concrete Tank Cannot Contain Fuels
  - Concrete was never meant to contain fuel; thus, it was designed with a ¼-inch steel liner.
  - Concrete is porous, shrinks, and cracks over time; not an effective fuel barrier.
  - The porous nature of concrete is demonstrated by the 2014 leak and staining underneath most tanks.

- Fuel Release Depends on Integrity of ¼-inch 75-year old steel liner
  - Liner's outside surface cannot be protected from corrosion; it cannot be maintained, repaired, or painted.
  - The Board of Water Supply (BWS) is concerned that the thinnest areas of the liner (from rust or other defects) will lead to a through wall hole.
  - The Navy has not demonstrated that they can find all areas that need repairing (are thinner than 0.160-inches).
Existing methods cannot possibly find and fix every thinned area in need of repair in the tank due to Tank’s enormous size.
2014 Release is NOT the Only Release

- A release from Tank 6 was reported by the Navy in 2002 (Navy, 2002).
- Tanks 15 and 16 also had fuel releases after 1988 (Navy, 2014).
- Navy TIRM report indicate that Tank 5, Tank 10, Tank 17, Tank 19, Tank 20 underwent inspections after 1988 that identified through-wall corrosion and therefore possibly leaks below the detection limit (Navy, 2016).
- The groundwater data from 2005 to present show petroleum chemical contaminants in groundwater samples.
- Petroleum staining found in cores taken before 2014 beneath 19 of 20 tanks (AMEC, 2002).
Navy Identifies Existing Single-Wall Tank (TUA 1A) as Proposed TUA Way Forward

“The Proposed TUA Way Forward. At this time, the Navy and DLA will:

• Continue with sustainment / maintenance of the existing tanks in accordance with current procedures as the Navy's initial best available practicable technology (BAPT) decision submittal.

Ref: https://www.cnic.navy.mil/regions/cnrh/om/environmental/red-hill-tank.html
Existing Single Wall Tank (TUA 1A) as the Navy’s TUA Way Forward

• Proposed TUA Way Forward is relying on interim and preliminary studies.
  • Laboratory analysis of Tank 14 coupons not yet available to SMEs for review and comment.
  • Interim groundwater flow model report.
  • Risk and vulnerability study not yet complete.
Existing Single Wall Tank (TUA 1A) as the Navy’s TUA Way Forward – cont.

• Installing new leak detection technology does not prevent releases to aquifer.
• Citing human error with Tank 5 repairs does not stop tank deterioration that required the repair in the first place.
• Secondary containment or tank relocation away from the aquifer affords the best protection of the aquifer.
Interim Groundwater Model Report

- Navy’s TUA Way Forward (TUA 1A) is relying on interim groundwater flow report that contains conclusions that have been considered to be faulty and incorrect by EPA, DOH, and BWS.
- Tank relocation away from the aquifer is the safest option.
- If the Navy wants to store millions of gallons of fuel 100 feet above the aquifer, secondary containment affords the best protection of the aquifer.
BWS Review – GW Flow

Navy presents that there is no GW flow from Red Hill to any BWS wells and that Red Hill Shaft captures all groundwater flow from beneath the tanks.

**BWS: Pumping test data from 2017-18 show water level changes across the valleys. EPA and DOH have asked the Navy to look at this stating some of the field data contradict Navy interim groundwater model flow paths.**

Navy Interim GW model calculation of groundwater levels at Navy monitoring wells (blue line) does not match with measurements collected in the field (yellow line)

**BWS: Lack of correlation between observed and model simulation means the model is not calibrated.** This is a fundamental requirement of a good model and it’s ability to produce reliable results. DOH and EPA share this same concern.

Figure 1. A comparison of the simulated and measured groundwater elevations in the RHMNW. RHMW07 is excluded from this graph since the water level in this well is very anomalous. The Red Hill Shaft (2254-01) is also excluded due to questions about the top of casing reference. Ref. Hawaii Department of Health memorandum to G. Fenix Grange from Robert Whittier re: Comments on the Progress of the Red Hill Groundwater Flow Model, February 20, 2018.

**: Model not calibrated.**
Summary

• If secondary containment (i.e. tank within a tank) is not selected then relocation should be strongly considered.

• Adequate supply of safe drinking water is critical to our economy.

• Question: Is the Navy listening and adopting our recommendations?

• BWS providing AOC input to inform the parties on what we believe they need to know – not what they want to hear.
Summary – cont.

- Facility is over 75 years old and continues to age.
- ¼-inch steel plates keeping fuel in the tanks continues to rust.
- Fuel contamination already present in groundwater and rocks underneath facility.
- Large volume of fuel stored 100 ft. above aquifer poses unacceptable risk to drinking water.
Questions/ Discussion