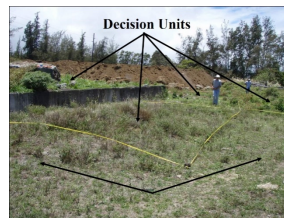
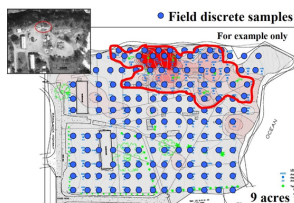


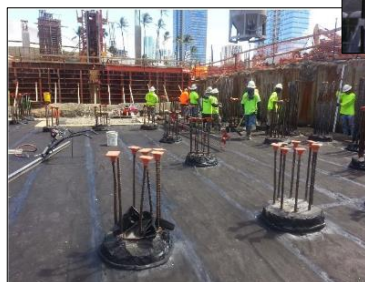
Environmental Investigation and Redevelopment of “Brownfield” Sites in Hawai‘i



Roger Brewer (Senior Scientist - Honolulu)

**Department of Health
Hazard Evaluation & Emergency Response
Brownfields Conference
Kauai July 2018**

Know Before you Dig... Unexpected Delays Can Cause BIG Problems



Environmental Hazard Management Plans (EHMP)

Three types of EHMPs

- 1. Areawide**
- 2. Site-specific**
- 3. Pre-construction**

3

Areawide EHMPs

- **Assumes widespread contamination over a large area (e.g., harbors, fuel terminals, etc.);**
- **Assumes that contamination will be encountered during construction work;**
- **Provides basic information for management of contaminated soil and groundwater disturbed during future site work;**
- **Covers common/public areas that have not been investigated (e.g.-streets);**
- **Is designed to protect public utility and construction workers from contamination in nearby areas.**

4

Site-specific EHMP

- **Any remaining areas of contamination identified and managed in place;**
- **EHMP provides basic information for management of contaminated soil and groundwater disturbed during future site work;**
- **May involve either an engineering (caps, etc.) or administrative control (restrictions on use of property, etc.).**

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Pre-Construction EHMPs

- **Is more detailed and activity specific (e.g.,- digging);**
- **Applies to areas where the investigation is ongoing concurrently or has not gone through the removal or remedial process;**
- **Is based on the assumption that contamination will be encountered via certain activities on-site;**
- **Is designed primarily to protect site workers and ensure that contaminated soil and groundwater are dealt with appropriately during construction work.**

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Sites in Kauai Tested by the HEER Office



Former Kekaha Sugar Mill



Main Concern: Former Pesticide Mixing Areas

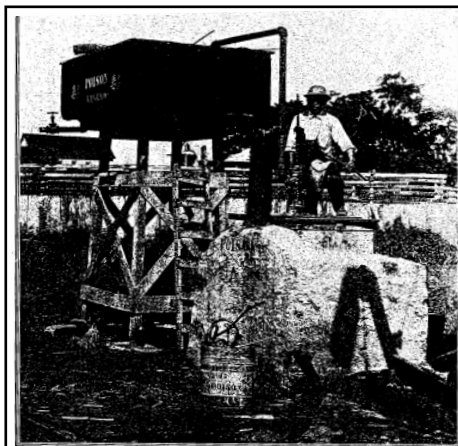
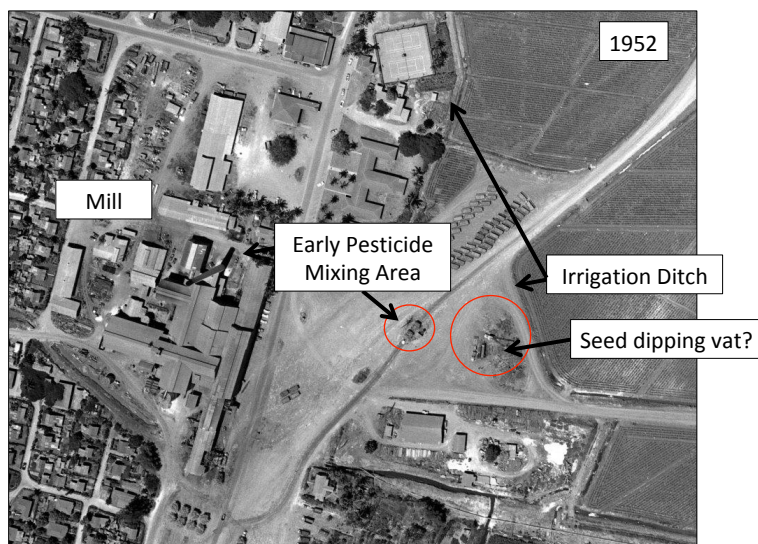


Fig. 2. Boiler and Tank for Stock Solution at Kilauea. The solution is pumped with the small hand pump from the boiler into the tank whence it runs by gravity into the Supply Tanks or other conveyances.

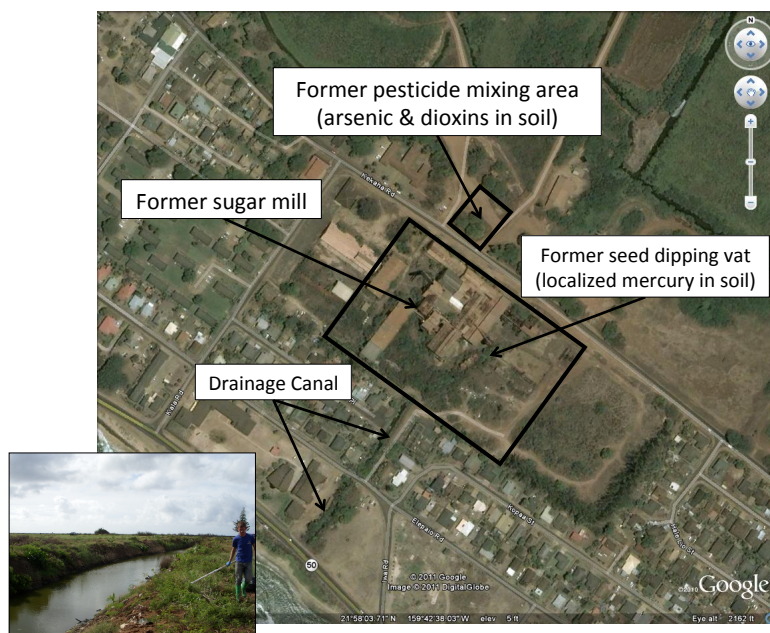
Weed Control:

- 1910s-1930s: Arsenic
- 1930s-1960s: PCP (pentachlorophenol, contained dioxins)
- 1970s-1990s: Triazines (degradable, less toxic).

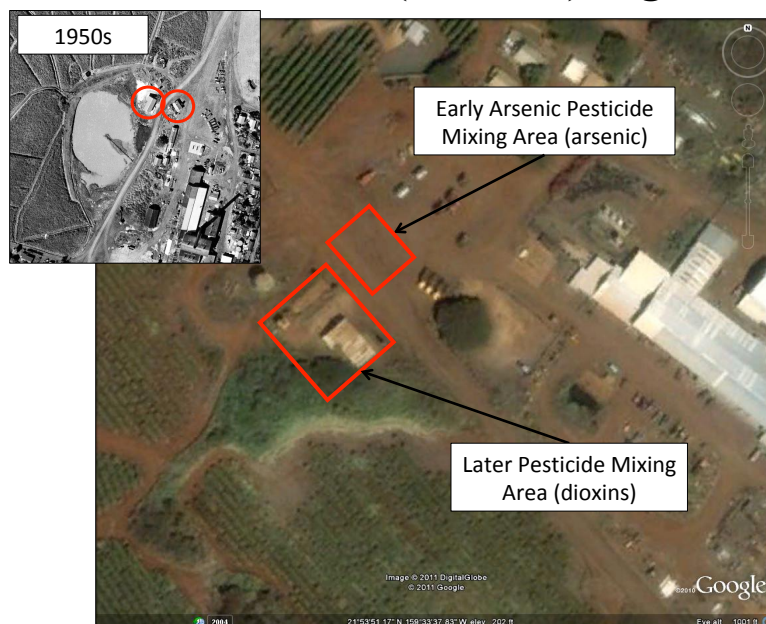
Former Kekaha Sugar Mill



Former Kekaha Sugar Mill



Former Numila (McBride) Sugar Mill

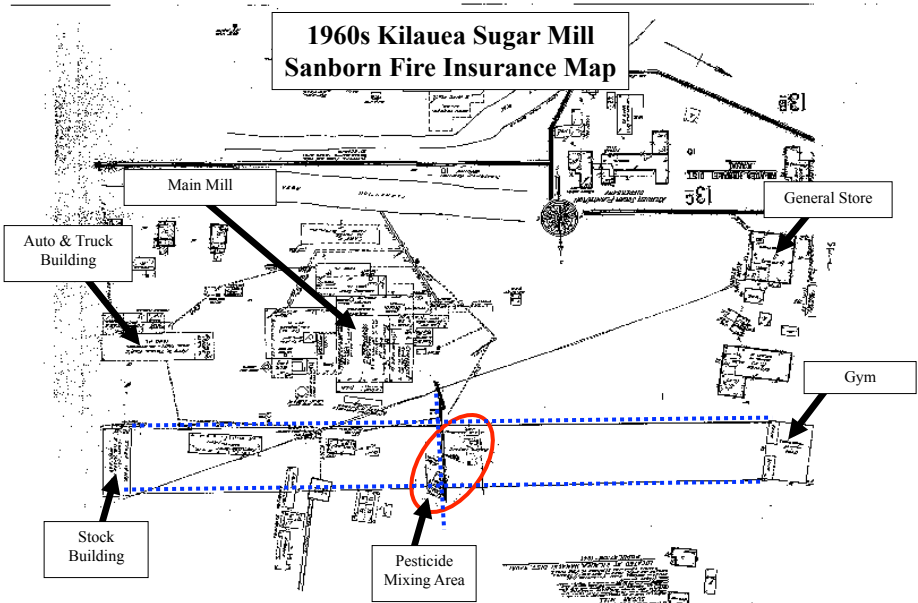


Former Kilauea Sugar Mill

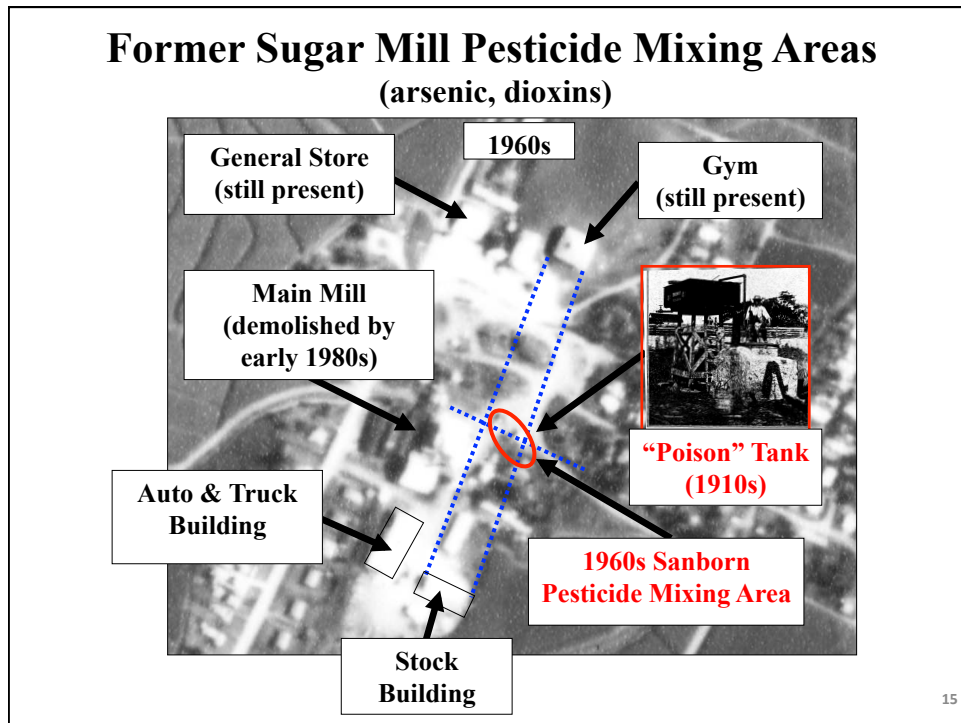


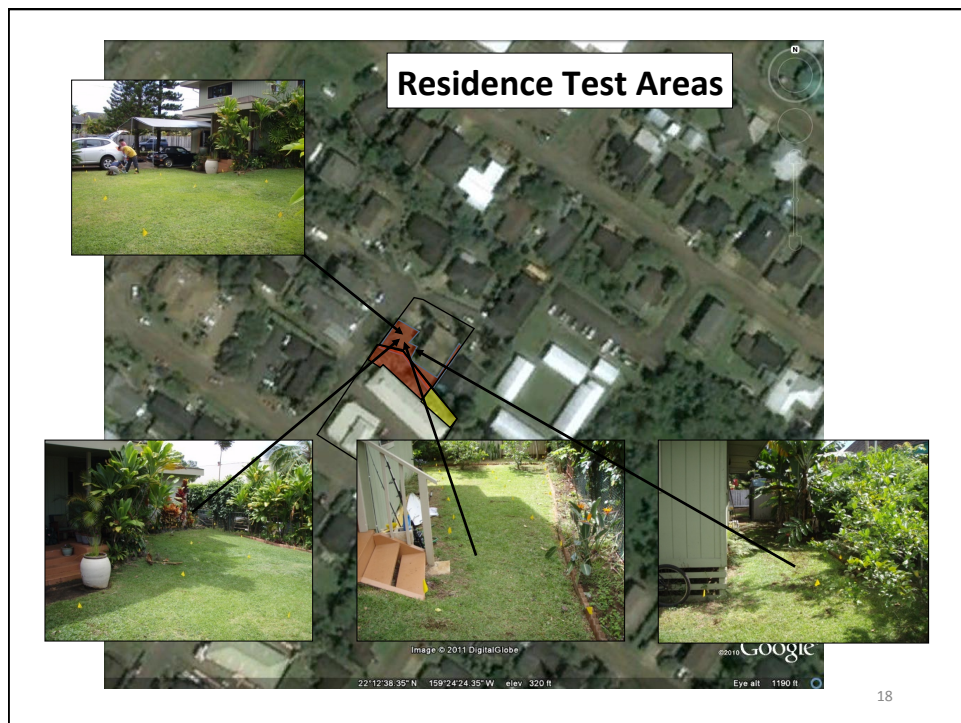
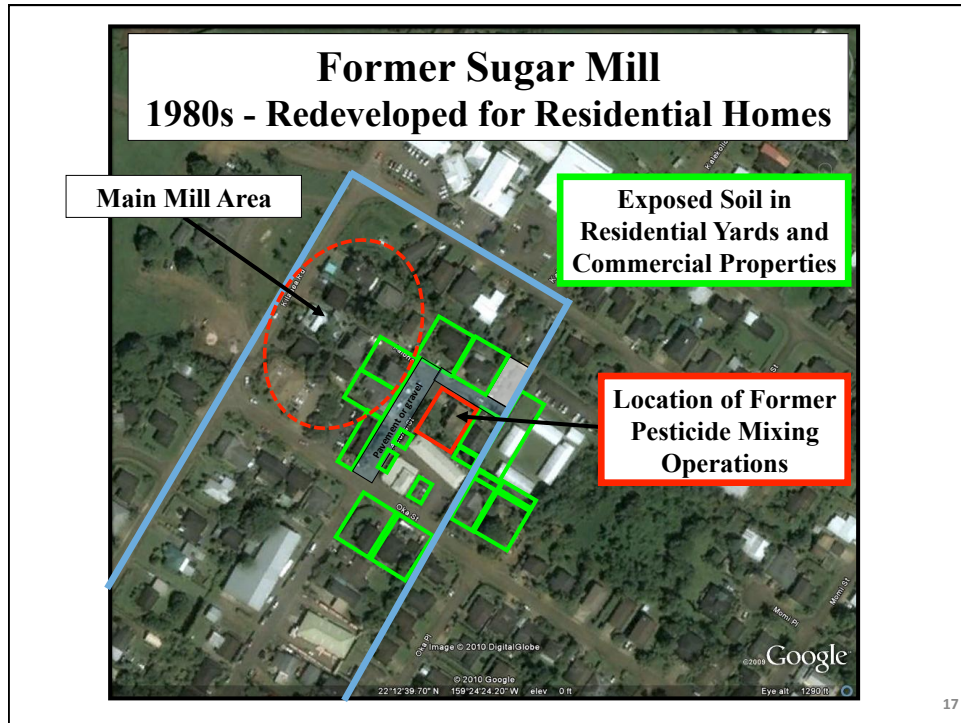
13

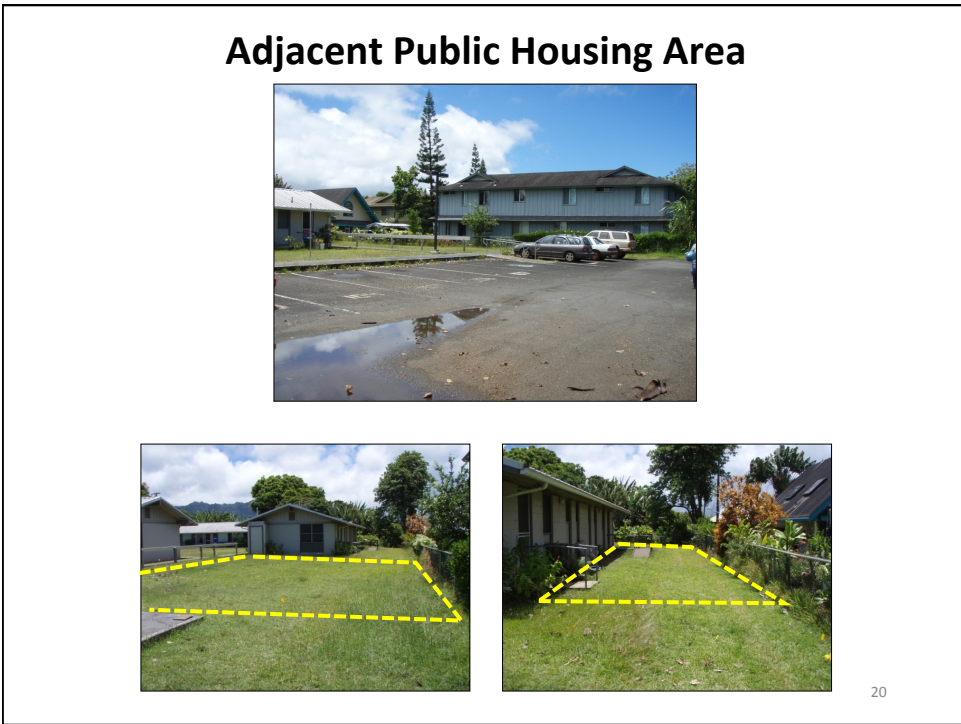
1960s Kilauea Sugar Mill Sanborn Fire Insurance Map



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Sampling and Testing of Exposed Soil

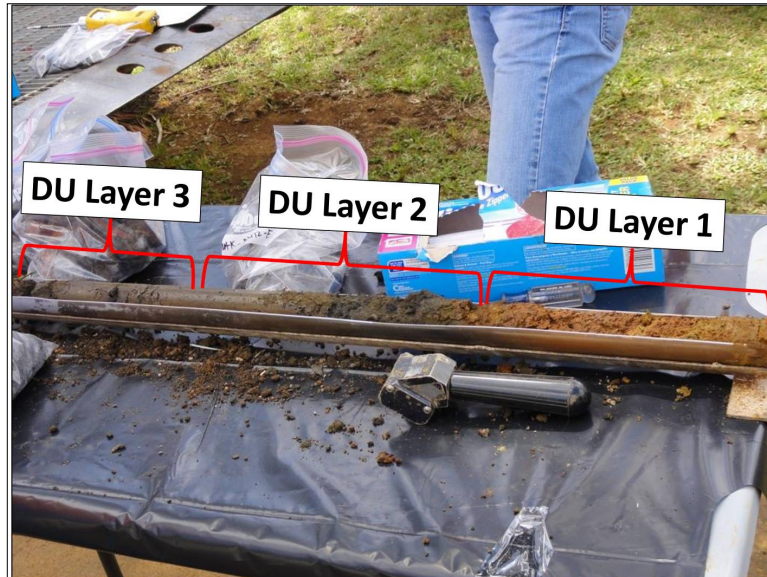


Testing of Deep Soil

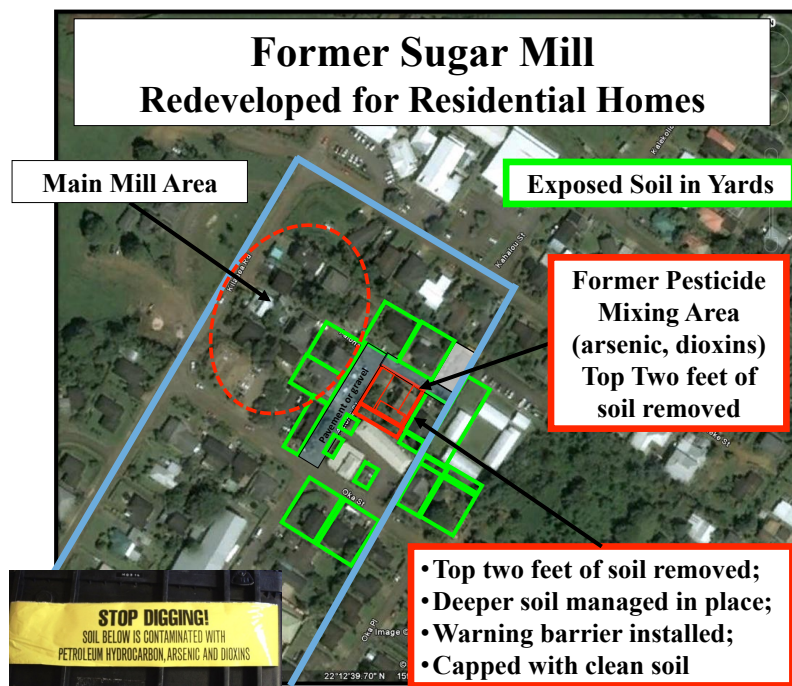


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Testing of Deep Soil

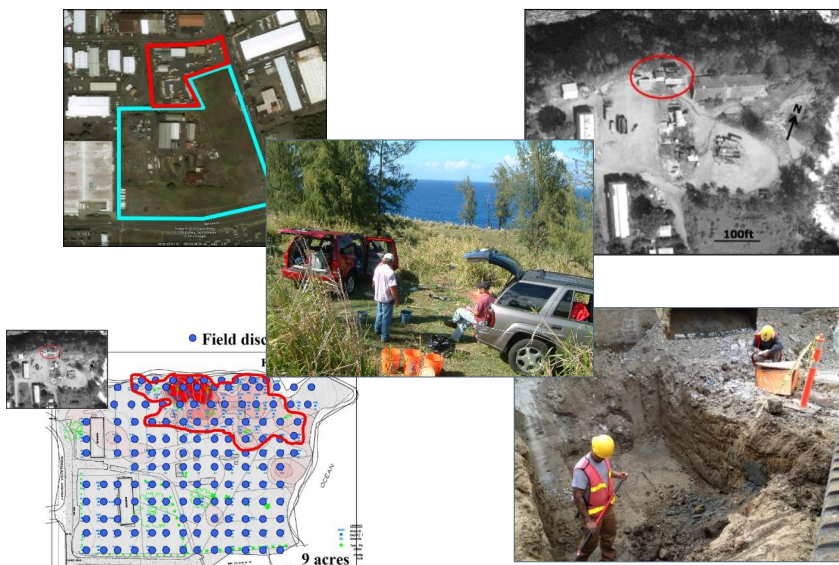


Former Sugar Mill Redeveloped for Residential Homes



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Questions?



What do these terms mean?

Phase 1 – What happen in the past?

Phase 2 – How bad is it and how far does it go?

Remedial Alternatives Analysis – What's the best thing to do about the problem?

Response Action Memorandum – This is what we're going to do about it

Remedial Action Completion Report – I did what I said I was going to do and this is what's left

No Further Action (unrestricted) – I can build on it and use it however I want to

No Further Action with Institutional Controls – I can use it as long as I follow the guidance the HDOH gives me.