



ESSAYONS Pump-out

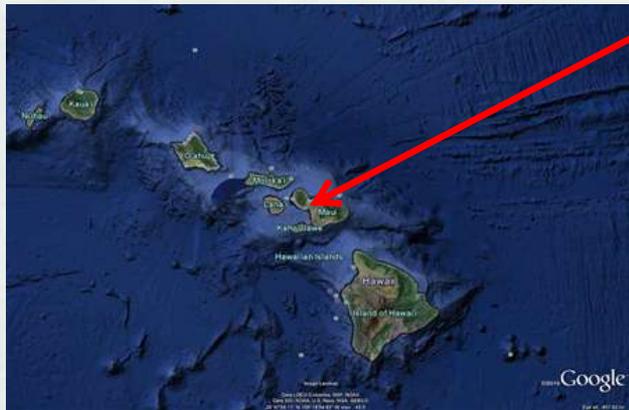
Tim Welp



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STATUS QUO

- ESSAYONS dredges POH channels about every decade or so.
- In the past, all Kahului Harbor dredged material was disposed of in the EPA Kahului Ocean Dredge Material Disposal Sites (ODMDS).
- Regardless of the fact that Maui beaches (like most other Hawaiian beaches) are sand starved.

A successful demonstration to pump ashore, treat, and use a limited volume of sand for beach renourishment would facilitate POH's pursuit of future more sustainable sediment management practices for effective Regional Sediment Management (RSM).



ESSAYONS Pump-out

Objective: In order to facilitate that change in the future we determine and document logistics of what would be required to:

- Use the ESSAYONS to pump Kahului dredged material ashore,
- Treat it (separate fines from sand),
- Stockpile beach quality sand for future renourishment,
- And dispose of fines into the ODMDS.

Use this documentation to make Kahului happen, then go for the other Islands.....



Approach

- Collect info on
 - ESSAYONS (architecture, capabilities, past production rates, etc.
 - Past and present Kahului Harbor project info (geotechnical data, site layout, etc.).
- Conduct a literature search on sediment separation technologies.
- Blend it and produce preliminary design of a sediment treatment process and scoping cost delta from Federal Standard.
- Document results in an RSM technical note.





Dredge ESSAYONS



Hull

Length (overall): 350'
Beam: 68'
Height (keel-to-mast): 126'
Minimum height clearance: 110'

Mean draft

Light: 22 '
Loaded: 32'
Displacement: 7,248 long tons
Deadweight tonnage: 9,500 long tons
Hopper volume: 6,423 cubic yards

Dredging depth

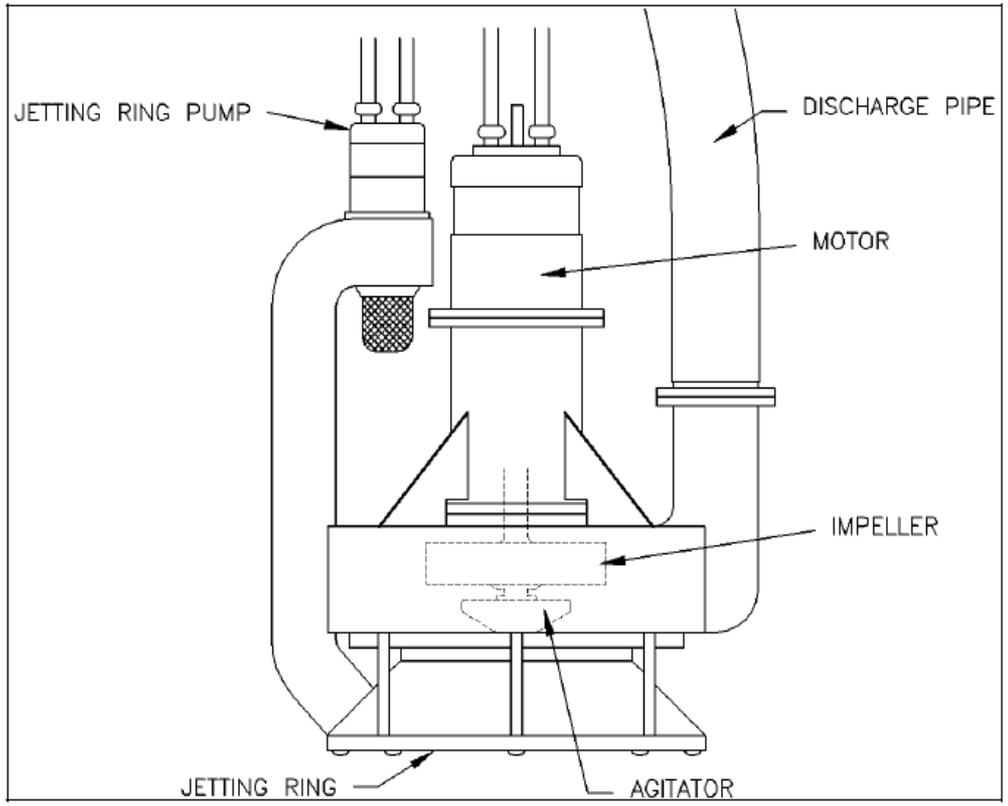
Normal dredging depth: from 35'to 80'
Extended dragarms: from 80' to 94'
Minimum disposal depth: 4' keel clearance
(Calm conditions - minimum 36' depth of water required at zero tide)

Direct Pump Out

Originally built with a side direct pump-out (DPO) but was never used



Solution: Submersible Pump



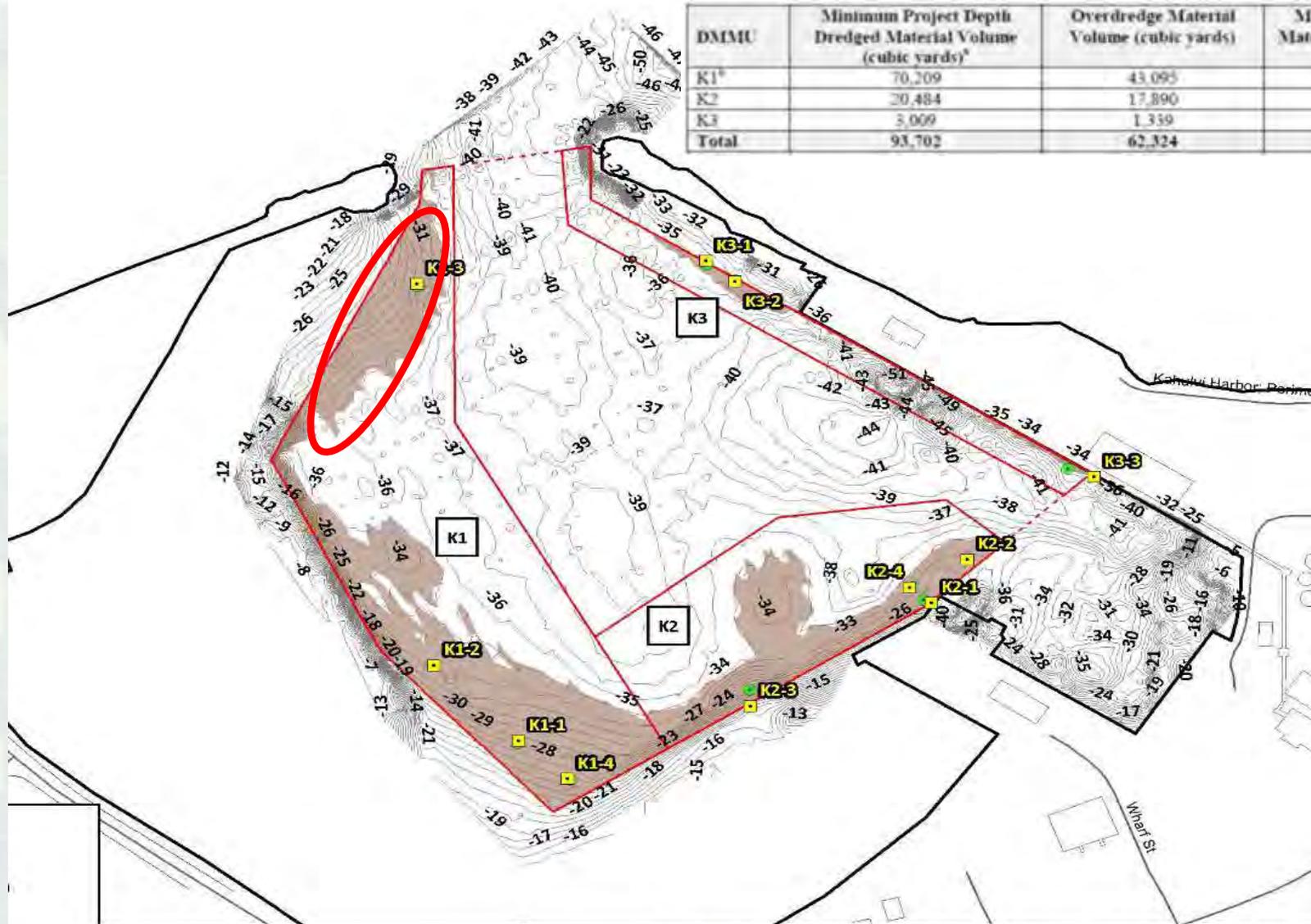
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DMMU	Minimum Project Depth Dredged Material Volume (cubic yards) ^a	Overdredge Material Volume (cubic yards)	Maximum Dredged Material Volume (cubic yards)
K1 ^b	70,209	43,095	113,304
K2	20,484	17,890	38,374
K3	3,009	1,339	4,348
Total	93,702	62,324	156,027



Plan View: Kahului Harbor, Maui

- GPS Field Points
- Sampling Stations
- Dredge Areas
- DMMU's
- Harbor Limit
- Shoreline
- 1-Foot Contours
- Buildings & Roads

Planimetric layers and annotation obtained from USACE Honolulu District 2013 bathymetric survey site plan digital files. Contours were created based on 2013 bathymetric survey data. Processing and mapping use coordinate system State Plane NAD 83 HARN (US Feet), Hawaii Zone 4. Reported depths at contour lines are relative to Mean Lower Low Water (MLLW). This map is intended for dredging planning purposes and should be considered to represent only the general conditions existing at the time. Map dated 16 September 2014.



BL
F MAUI



Aquatic BLUE
Sediment Coring Log

CLIENT: US Army Corps of Engineers	PROJECT: Hawaiian Harbors Sediment Study	PROJECT SITE: Hawaii
STA/VISID: FH14-KA-K1-3 (2)	DATE: 7/11/14	LOCATION: WPT0
WATER DEPTH (FT): 30.4'	TIDE (FT): 0.8	WIND WAVE HEIGHT (FT): 30.0
CORING LOG LENGTH (FT): 6.5'	PILE CORE LENGTH (FT): 7.5'	TIME STARTED: 0950
COMP. NUMBER: 4	NAVIGATION: WGS 84	EXTENSION NUMBER: 1

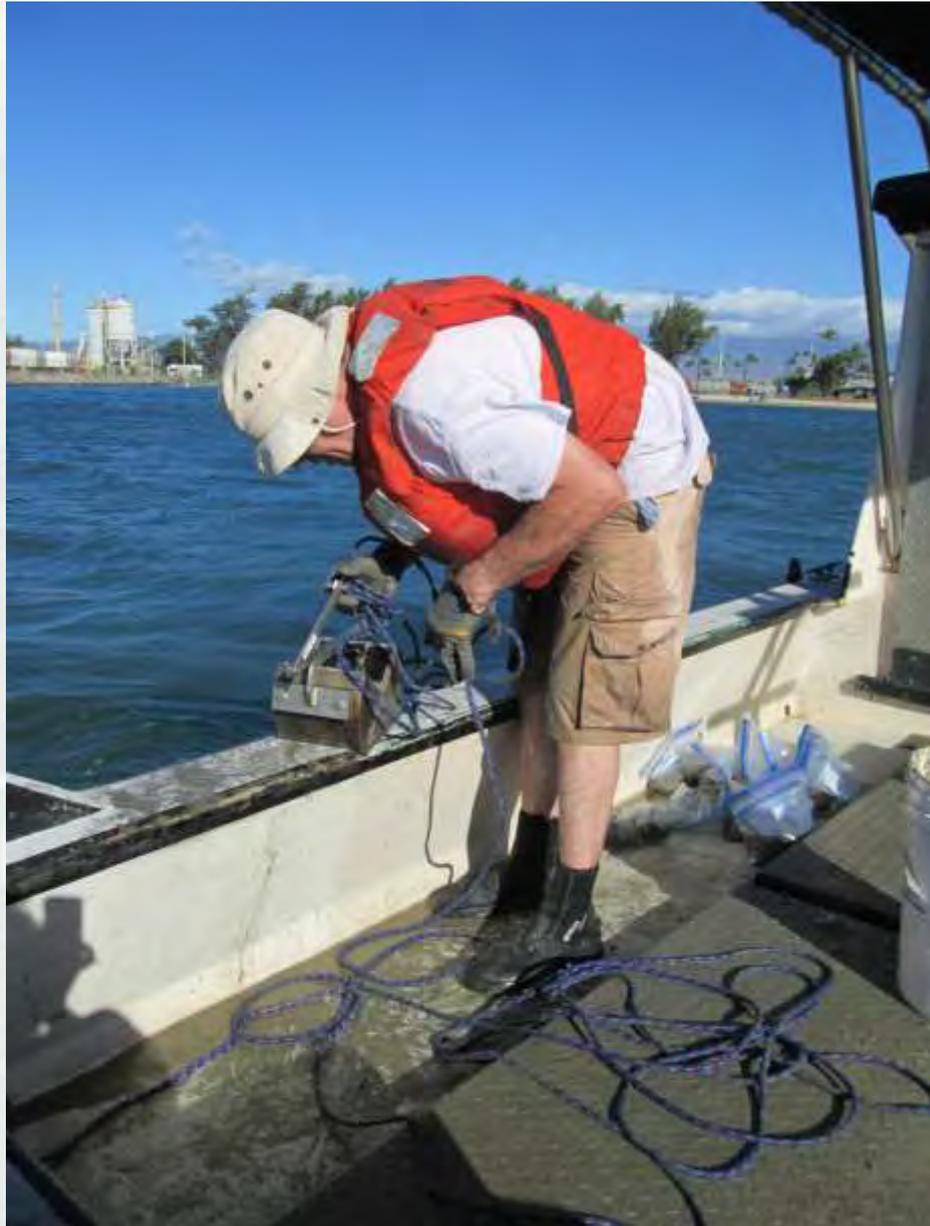
FEET BELOW MUDLINE	SEDIMENT TYPE	ODOR	COLOR (HUE VALUE/CHROMA)	SAMPLE ID BY DEPTH/COMMENTS
1	Sand	None	Dark Brown w/Light Tan	Uniform - Low Water Content
2				
3				
4				
5				
6				
7				
8				



KATULUHI
FH14-KA
K1-3-1
7/11/14







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Applying RSM with Island EWN





Imagery Date: 4/25/2013

20°53'49.29" N 156°28'15.37" W elev. -14 ft.

Planimetric layers and annotation obtained from USACE Honolulu District 2013 bathymetric survey site plan



GPS Field Points



Dredge Areas

What We Found on Maui Shoal



**Approximately 30,000 yd³ of sediment
above the authorized project depth.**



Lab Analyses

- Waiting to receive samples.
- Run grain size distribution curves
- Calculate settling velocities
- Calculate cut points



Separation Technologies



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Grain Size Engineering



Existing data shows a fines loss due to hydraulic dredging of greater than 50% from in-situ sources to post construction fill



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Engineer Research and Development Center





Can fit a 200 ft x 200 ft square CDF here.
Would require a 4 ft lift of sand to total 6,000 yd³.



The End Questions?

