

Salt Lagoon Sampling : A Sediment Quality Triad Approach

September 15 – 21, 2002

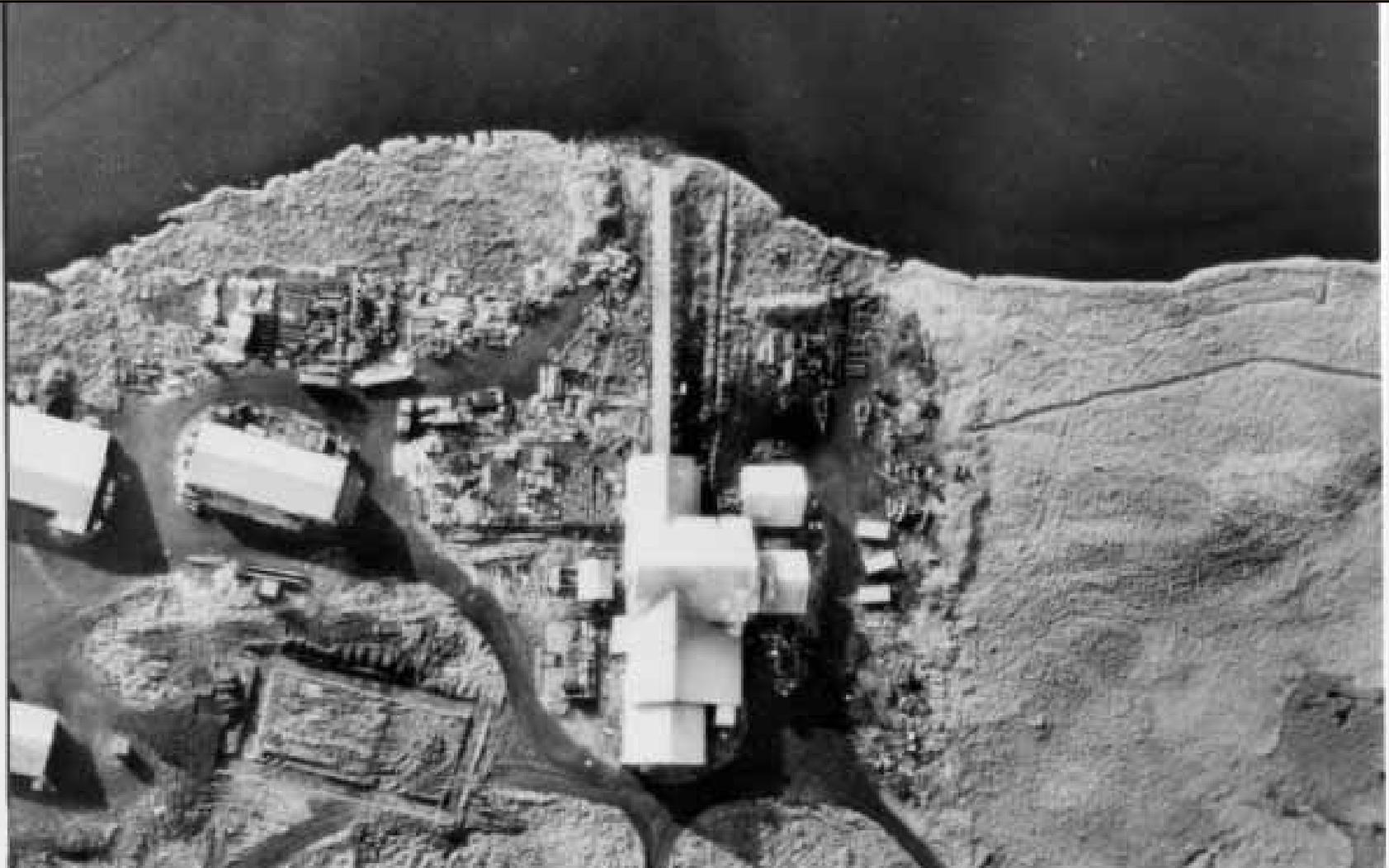
Purpose of Investigation

- To evaluate the risk to the marine environment posed by contamination from TPA Site 13, specifically from DRO (Diesel Range Organics) and PAHs (Polycyclic Aromatic Hydrocarbons)
- The sampling results may impact the procedure followed during dredging of the Salt Lagoon channel (scheduled for FY03)

Site History

- Contamination in the form of DRO and PAHs have been found at TPA Site 13 in the past.
- DRO contamination was found in the soils of TPA Site 13 during studies in 1990, 1995, and 2000.
- DRO was also found in the sediments of the channel in 2001.
- PAHs were found in mussel tissues during a survey in 2000.

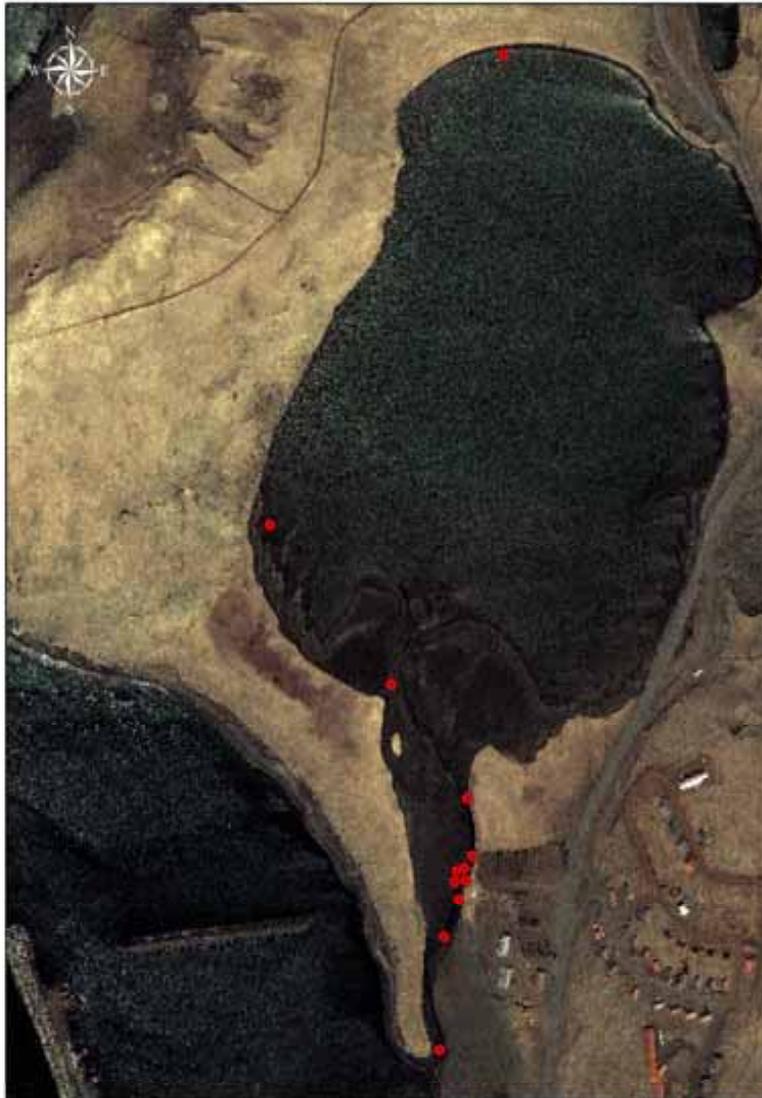
1982 Photo of Former Seal Processing Plant, St. Paul Island



Sampling Locations

- 12 sampling locations were selected throughout the Salt Lagoon and the Salt Lagoon channel.
- 10 sites were located in the channel, and 2 were reference sites in the lagoon.
- Targeted sampling was applied, with about half of the sites purposely located near TPA Site 13.

Salt Lagoon Sample Locations
September 2002

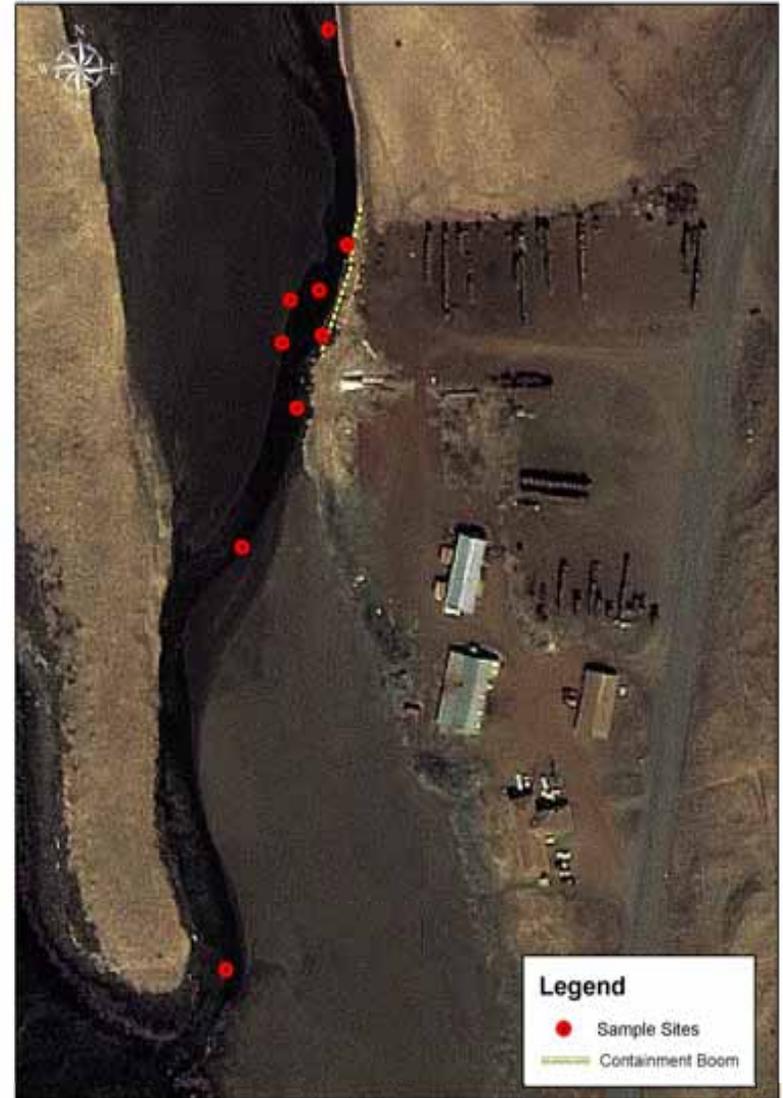


200 100 0 200 Meters

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Salt Lagoon Channel Sample Locations
September 2002



Legend

- Sample Sites
- Containment Boom

50 25 0 50 Meters

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Sampling Procedure

- At each of the 12 stations, benthic grabs were collected with a petite PONAR grab sampler.
- Samples were taken for the following tests and analyses:
 - Benthic species enumeration
 - Amphipod Bioassay (survivability test)
 - Sediment chemistry (DRO, TOC, and PAH)
 - Grain size analysis





SPMD Deployment

- SPMDs = Semi-Permeable Membrane Devices
- They consist of a metal cylinder with a membrane inside that takes up organic contaminants from the water column.
- SPMDs are placed at fixed sites and submerged in the water column for a certain length of time.
- Five sampling sites were selected for SPMD deployment, including one reference site in the lagoon.
- The concentration of contaminants taken up by the SPMDs will be used to evaluate the amount of contamination in the water column from TPA Site 13.

SPMD canister, submerged in water at low tide





The Triad Approach

- The triad approach involves studying the quality of the sediment from three perspectives.
- Sediment chemistry tests reveal whether or not channel and lagoon sediments are contaminated.
- Investigating the benthic infauna through enumeration and a survivability test allow evaluation of the risk to the marine environment.
- SPMDs indicate the potential for organic contaminant uptake from the water column by marine organisms.