



## Investigation Area H1 Remedial Action Plan, Record of Decision, & RCRA Closure Plan

June 1, 2006  
Public Meeting



### Agenda



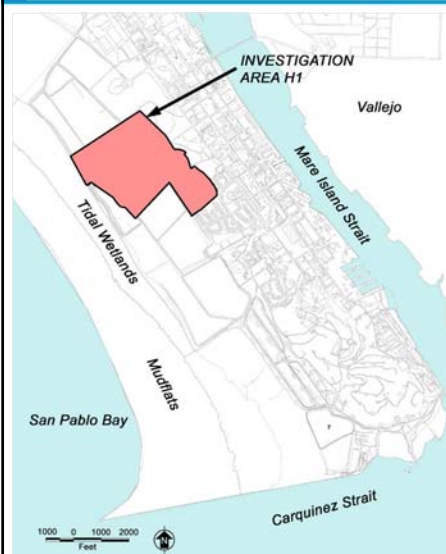
- Scope of the Remedial Action Plan, Record of Decision, and RCRA Closure Plan
- Description of Investigation Area H1
- Remedial (Cleanup) Alternatives Evaluation
- Proposed Remedial Actions
- CEQA Determination
- Questions and Public Comments

## RAP/ROD/RCRA Closure Plan -Scope



- Site History, Previous Investigations and Community Participation
- Nature and Extent of Contamination
- Current and Future Land Use (Restricted Open Space)
- Human and Ecological Risk Assessment
- Description and Evaluation of Remedial Alternatives
- Applicable Regulatory Requirements
- Resource Conservation and Recovery Act (RCRA) Closure Requirements
- Proposed Remedial Actions

## Investigation Area H1 (IA-H1)



- 230 acre site located on Mare Island
- Portions of IA-H1 used for disposal or processing of municipal and industrial Shipyard wastes from 1942 to 1995

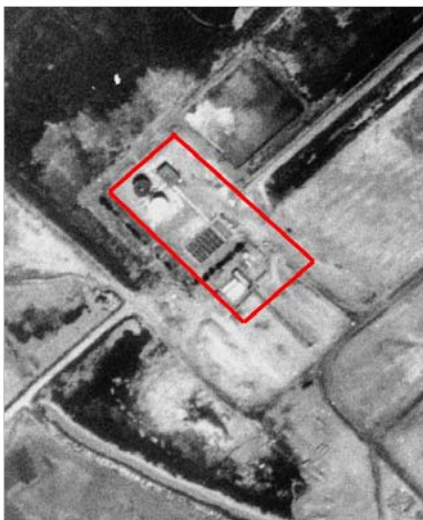
## IA-H1 History



- Facility/RCRA Landfill
  - Accepted Shipyard waste from 1940's to 1980's
  - A portion of the landfill operated under Resource Conservation and Recovery Act (RCRA) rules in the 1980's
  - Soil cover maintenance and groundwater monitoring is on-going
  - Access restricted by chain-link fencing

1985 photo

## IA-H1 History (cont'd)



- Sanitary Sewage Treatment Facility (SSTP)
  - Operated from 1955 to 1972
  - Treated effluent discharged to San Pablo Bay
  - Discharge routed to Vallejo Sanitation and Flood Control District (VSFCD) treatment facility after SSTP closure

1966 photo

## IA-H1 History (cont'd)



- Industrial Wastewater Treatment Facility (IWTP)
  - Operated from 1972 to 1995
  - Treated effluent discharged to San Pablo Bay until 1976, to VSFCO thereafter
  - Surface impoundments closed in 1989 and replaced with above-ground tanks

1985 photo

## IA-H1 History (cont'd)



- Waste Oil Sumps (IR-02)
  - Operated from 1940's to mid 1960's
  - Over 4M gallons of waste oil discharged to unlined sumps
  - An unknown quantity of oil removed (reclaimed) prior to backfill of sumps

1954 photo

## IA-H1 History (cont'd)



- Lead oxide battery storage area (IR-16)
  - Submarine and forklift batteries
  - High lead levels in soil

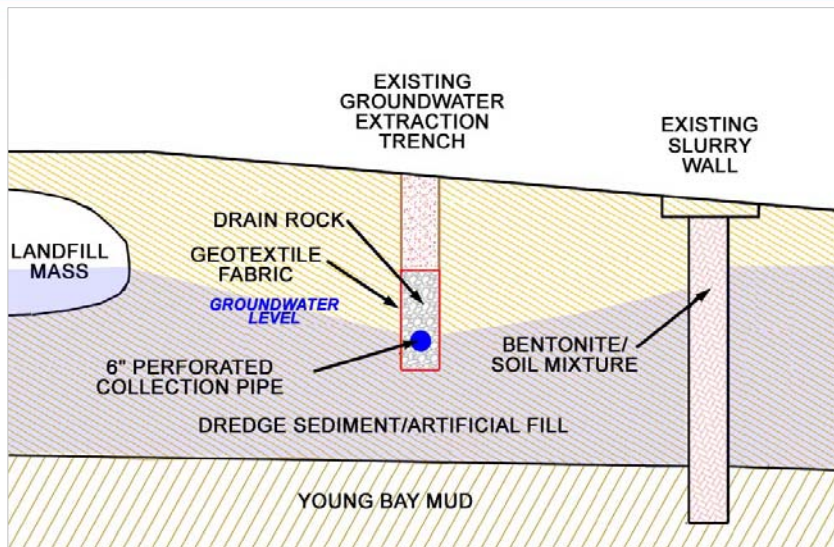
1949 photo

## IA-H1 History (cont'd)



- 2004 Interim Remedial Action
  - Groundwater containment barrier (soil-bentonite slurry wall) – 7,200 linear feet
  - Groundwater extraction trench installed adjacent to entire length of slurry wall
  - Encircles 72 acres within IA-H1, including Landfill, IWTP, and Oil Sumps (Containment Area)
  - Prevents lateral migration of shallow groundwater from leaving Containment Area
  - Extracted groundwater discharged to VSFCDD for further treatment (over 14.9 million gallons extracted to date)

## Groundwater Containment Details



## Slurry Wall Installation



## IA-H1 Geology Conditions

- Artificial Fill (dredge sediment)
  - Most of the Mare Island landmass (including IA-H1) formed in 1900's through dredging activities
  - Sediment (clay/silt) has very low hydraulic permeability
  - Depth varies from less than 10 feet to over 20 feet below ground surface (bgs)
- Natural Deposits (mud/sand)
  - Thick layers of Young Bay Mud/Old Bay Mud, with thin interbedded sand layers, underlie the artificial fill
- Bedrock
  - Varies from 40 feet bgs along eastern boundary of IA-H1 to 185 feet bgs beneath the RCRA/Facility Landfill

## IA-H1 Groundwater Conditions

- Three water-bearing zones (silty sands)
  - Shallow, Intermediate, and Deep groundwater zones separated by clay/silt layers (Young/Old Bay Mud)
  - Flow direction is to the northwest (toward San Pablo Bay)
  - Flowrate very slow (example: 5 to 7 ft/year for shallow groundwater zone outside the Containment Area)
- Contaminants
  - Elevated concentrations of metals and petroleum compounds routinely detected in shallow zone (now extracted within Containment Area)
  - Elevated concentrations of metals occasionally detected in intermediate and deep zones
  - Other contaminants rarely detected

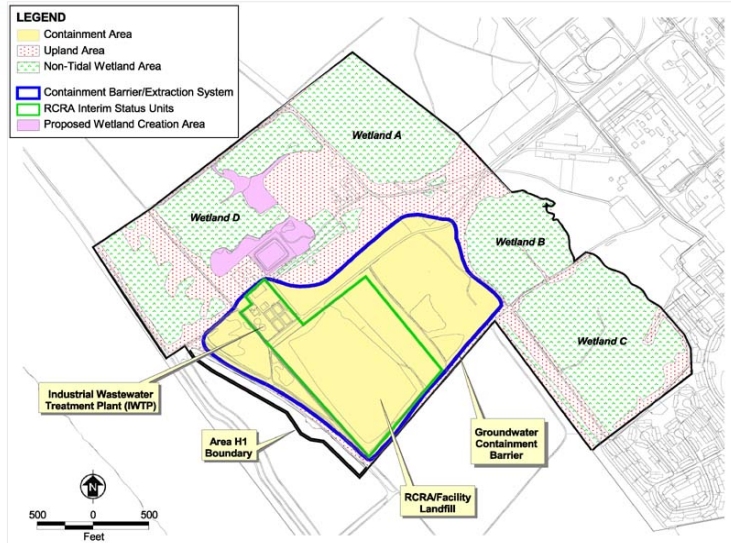
## IA-H1 Groundwater (cont'd)

- Regional Water Quality Control Board (RWQCB, 2004) approved beneficial use exemption for groundwater within IA-H1 due to high dissolved solids (salinity)
  - Low recovery (flow) rates due to low permeability of natural clays/silts also makes groundwater impractical for drinking water uses
- Nevertheless, RWQCB requires that waters of the State attain background levels of water quality, or the highest level of water quality reasonably achievable

## IA-H1 Functional Areas

- IA-H1 was divided into three functional areas for the purpose of developing cleanup alternatives:
  - Containment Area (bounded by slurry wall)
  - Upland Areas Outside the Containment Barrier
  - Non-Tidal Wetland Areas Outside the Containment Barrier
- A series of remedial alternatives for each area were developed and evaluated

## IA-H1 Functional Areas



## Containment Area – Remedial Alternatives Evaluated



- No Action (Alternative 1)
- On-Site Containment (Alternatives 2A, 2B)
- Removal & Off-Site Disposal (Alternative 3)

## Containment Area Alternatives



- Alternative 1 – “No action”
  - Continue maintenance of landfill soil cover
  - Continue groundwater quality monitoring outside the containment barrier
  - Continue operation of groundwater extraction system
  - May result in unacceptable long-term risk of exposure to waste for humans and the environment

## Containment Area Alternatives



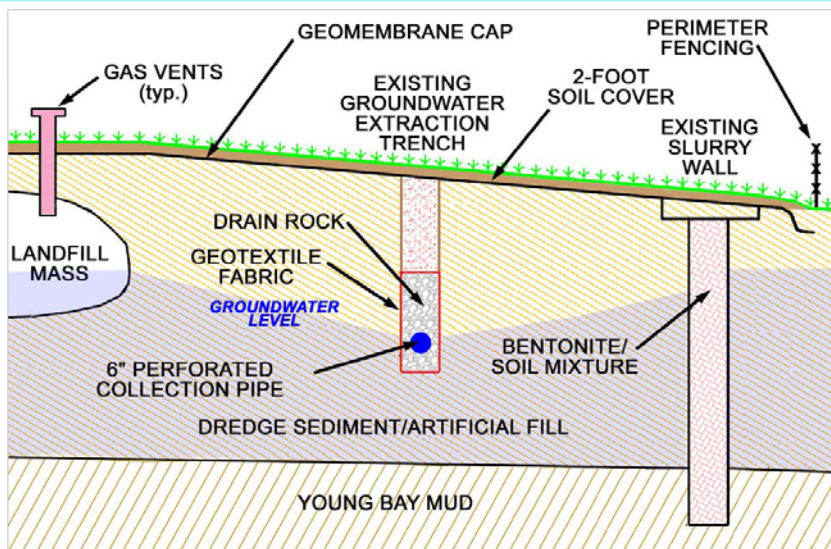
- Alternatives 2A and 2B – On-site containment
  - Combines a horizontal barrier (cap) with the existing vertical groundwater containment barrier
  - Geosynthetic materials used to exclude rainfall infiltration, which in turn reduces landfill gas generation and potential for leaching of contaminants into groundwater
  - Geosynthetics and soil cover, planted with native grasses, will minimize erosion and prevent human or animal contact with waste materials
  - Vents provided to avoid accumulation of landfill gases (primarily methane) under the cap
  - Existing perimeter groundwater barrier and extraction trench provides redundant (“backup”) protection for groundwater

## Containment Area Alternatives

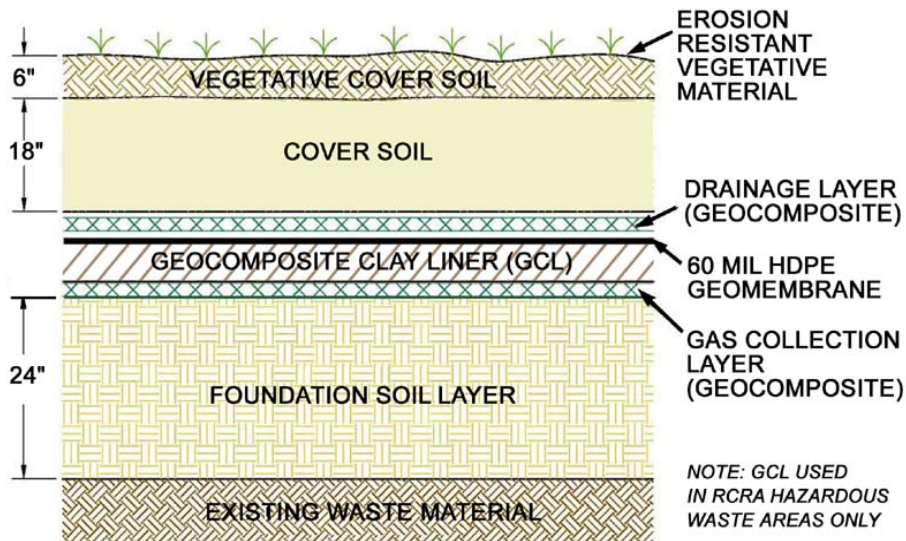


- Alternative 3 – Removal and off-site disposal
  - 600,000 to 1,000,000 tons of waste materials mixed with soil are located inside the Containment Area
  - Mixture of clay/silt, concrete rubble, metal debris, wood debris, and household/office garbage renders treatment impractical
  - 50,000 or more truckloads would be required
  - Potential impacts to workers or the public during excavation and transport over two to three year period
  - Does not eliminate waste; merely relocates to another facility

## Proposed Remedy – Containment Alternative 2A



## Alternative 2A – Containment Horizontal Cap Details



## Containment at IA-H1 is an Effective Remedy



- High density polyethylene (HDPE) geomembrane is very resistant to biological attack or chemical degradation
- Total service life of buried 60-mil HDPE geomembrane varies with conditions, but half-life estimated at 450 years (Geosynthetic Institute, June 2005)
- IA-H1 Containment Area is surrounded and underlain by low-permeability sediment
  - Groundwater moves very slowly
  - Shallow groundwater is contained by vertical barrier
  - All three groundwater bearing zones outside the containment barrier are monitored for contamination quarterly

## Containment at IA-H1 is an Effective Remedy



- Containment facilitates beneficial use of soil with similar contaminants for use as cap sub-grade material (e.g. Marine Corps Firing Range)
- Containment facilitates consolidation of small impacted areas spread over a larger area into one location with appropriate controls
- Containment results in much lower potential for off-site impacts due to elimination of truck traffic carrying waste
  - Some visual impact from scrapers carrying borrow soil for cover soil above the geosynthetics

## Upland Areas Remedial Action Objectives



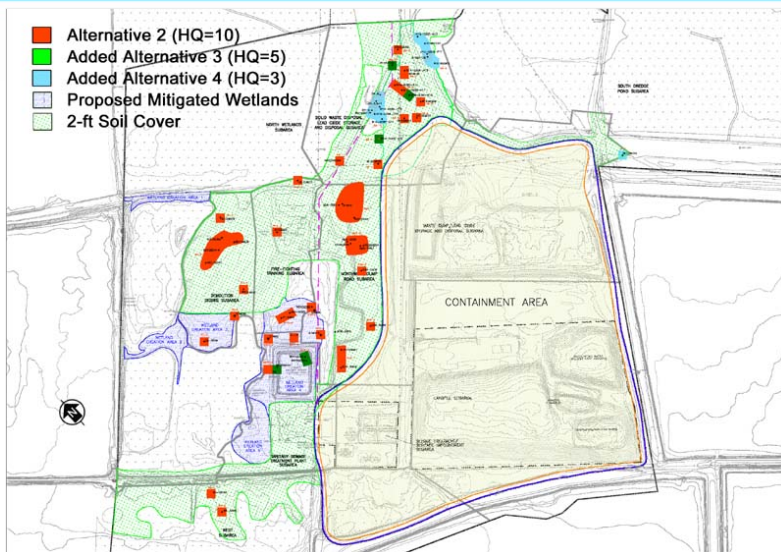
- Upland Areas Outside Containment Barrier
  - Reduce human health risk from exposure to soil contaminants
  - Reduce exposure to soil contaminants posing immediate and significant or potential ecological risk (gray fox, northern harrier, western meadowlark, ornate shrew, and California vole)
  - Reduce downward migration of contaminants to the shallow water-bearing zone
  - Reduce migration of surface soil contaminants toward the Non-Tidal Wetland Areas
  - Further reduce low residual risk posed by potential munitions or radiological items

## Upland Areas Alternatives



- Alternative 1 – No action
- Alternatives 2, 3, & 4 - Other alternatives
  - Hot spot removal (based on ecological Hazard Quotients)
    - “Hot spots” defined as soil which threatens human health, ecological receptors (animals), or groundwater
    - Excavated soil would be relocated to Containment Area
  - Groundwater monitoring
  - 2-ft soil cover to further reduce ecological risk
  - Institutional controls
- Alternative 5 - Complete debris/soil removal with off-site disposal

## Proposed Remedy: Hot Spot Removal Alternative 4



## Non-Tidal Wetland Objectives



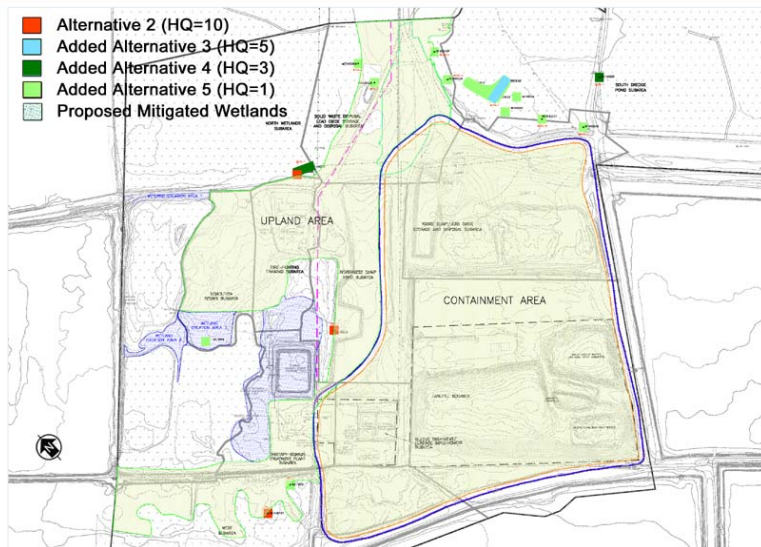
- Non-Tidal Wetland Areas
  - Reduce exposure to soil contaminants
  - Reduce exposure to soil contaminants posing immediate and significant or potential ecological risk (killdeer, great blue heron, mallard, and salt marsh harvest mouse )
  - Reduce exposure (ingestion) to surface water

## Non-Tidal Wetland Alternatives



- Alternative 1 – No action
- Other Alternatives
  - Hot spot removal
    - “Hot spots” defined as soil which threatens human health, ecological receptors, or groundwater
    - Cleanup driven primarily by risk to sensitive species
    - Excavated soil would be relocated to Containment Area
  - Wetlands habitat monitoring
  - Institutional controls to maintain wetland habitat

## Proposed Remedy: Hot Spot Removal Alternative 5



## Other Required Actions



- Create 8.2 acres of new wetlands to replace 7.2 acres of degraded wetlands within the Containment Area which would be capped
- Trap and/or passively relocate any salt marsh harvest mice present within the Containment Area wetlands prior to capping
- Maintain/expand existing Mare Island trapping program within Containment Area for burrowing animals to minimize soil cap maintenance
- Long term operation & maintenance (O&M) of remedy components and institutional land use controls



## CEQA Initial Study



- California Environmental Quality Act (CEQA)
- A CEQA Initial Study was prepared by DTSC to evaluate environmental impacts from the proposed cleanup and closure actions at IA H1
- DTSC has concluded that the project will not have a significant impact on the environment and intends to issue a CEQA Negative Declaration

## Closure Plan Public Review



- Remedial Action Plan (RAP)/Record of Decision (ROD)/Resource Conservation and Recovery Act (RCRA) Closure Plan
  - Document available in JFK Library, DTSC Office (Berkeley), or online at [www.mareisland.org](http://www.mareisland.org)
- Public comment period
  - May 30, 2006 to June 30, 2006
  - Written comments may be submitted to:
    - Navy BRAC Environmental Coordinator
    - DTSC Public Participation Specialist

## Public Comments or Questions



- Navy BRAC Environmental Coordinator

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