

Integration of Sustainability and Resiliency into a Remedy Optimization Review Framework

Hunters Point Naval Shipyard
DON Base Realignment and Closure (BRAC)

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The logo for CDM Smith, featuring the company name in a bold, white, sans-serif font on a blue background. The 'C' and 'M' are stacked above the 'S' and 'M'.

**CDM
Smith**

**Tenth International Conference on Remediation and
Management of Contaminated Sediments**

February 11-14, 2019
New Orleans, LA

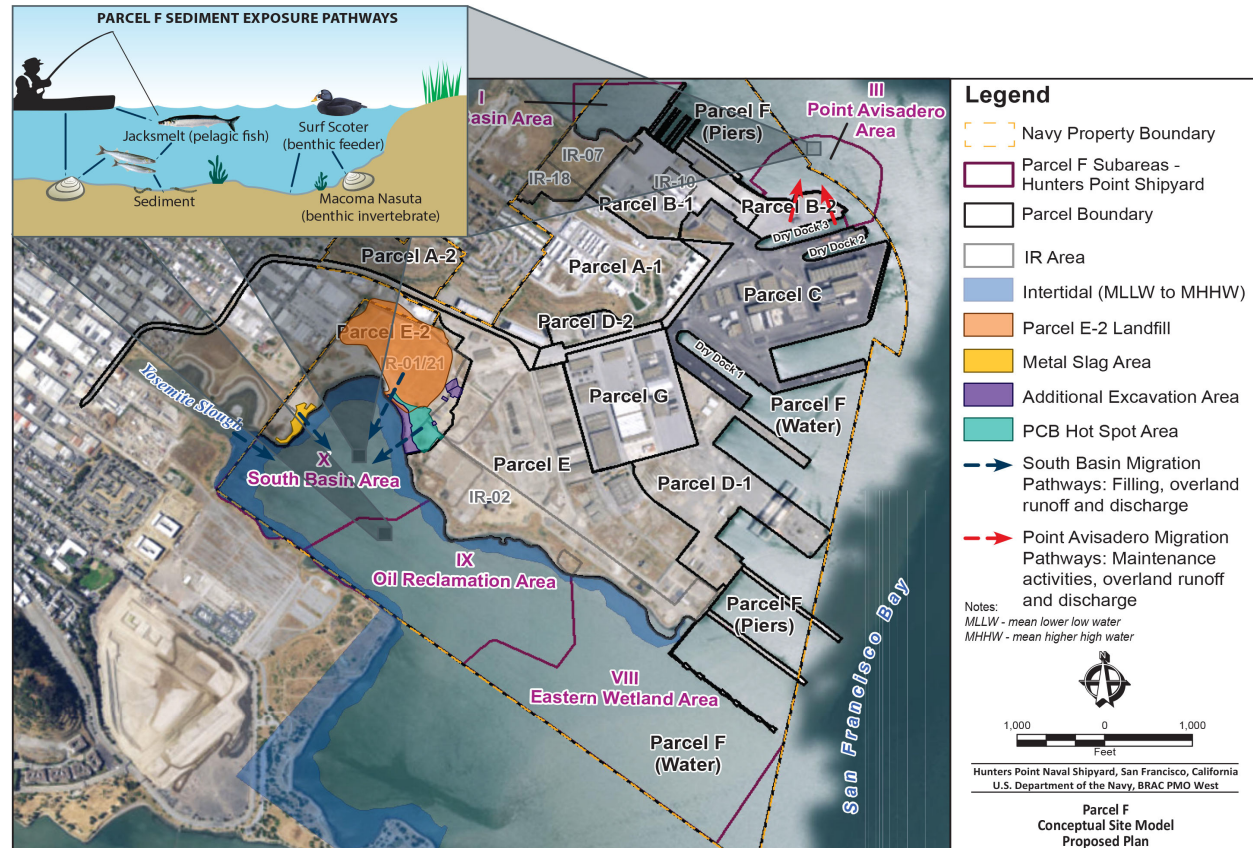
Outline

- Brief site background
- Technology assignment optimization framework
- Sustainability assessment
- Resiliency evaluation
- Continuous optimization process

Sediment Remedial Action

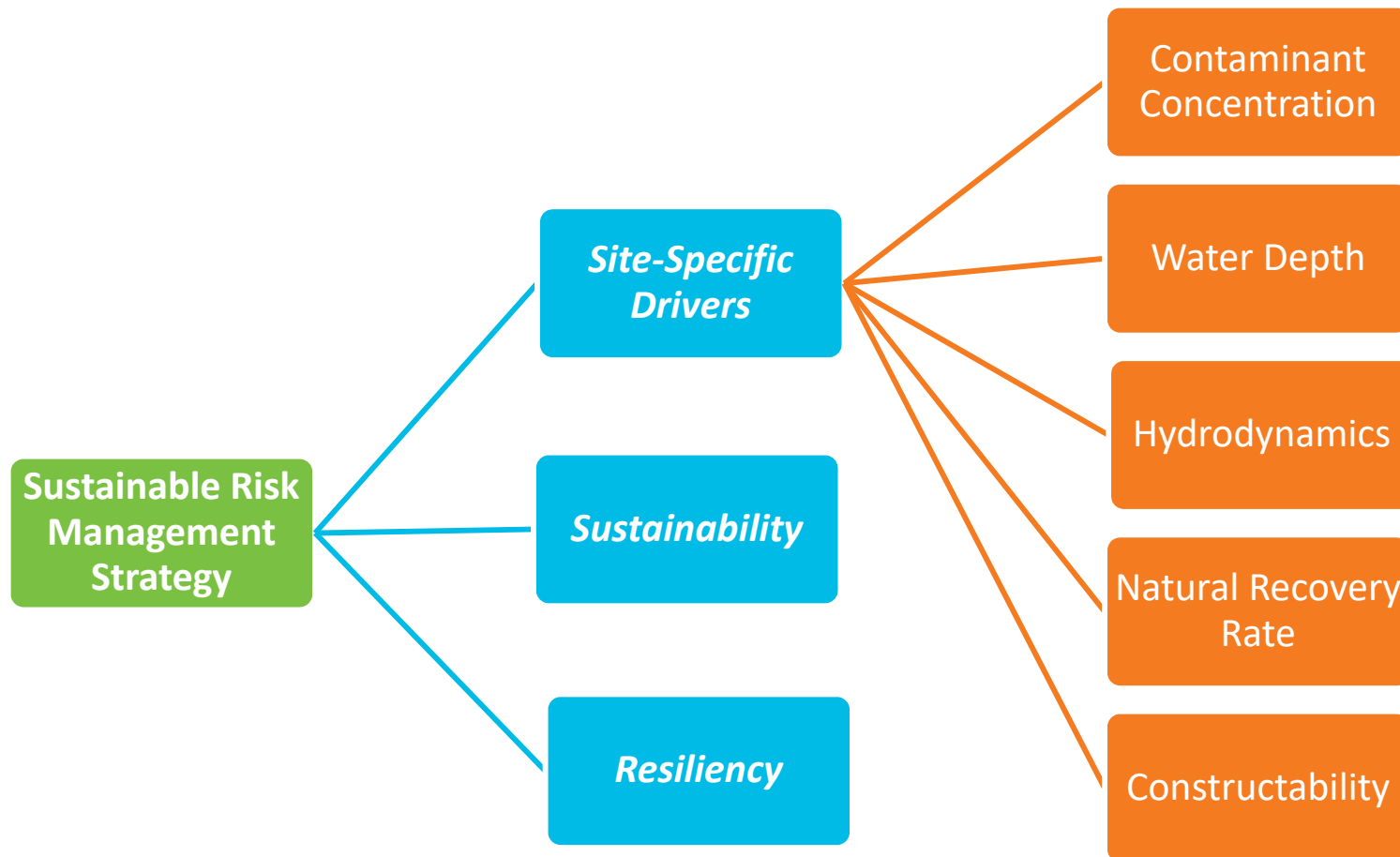
- *Site Contaminants*
 - Metals
 - PCBs

- *Remedial Technologies Considered*
 - Sediment removal
 - *In situ* treatment
 - Capping
 - Monitored natural recovery (MNR)



**Two treatment areas, Area III and Areas IX/X*

Technology Assignment Optimization Framework



Site-Specific Drivers Evaluation

Contaminant Concentration

Not to exceed Preliminary Remediation Goals (PRGs)

90% reduction in bioavailable PCBs via carbon-based amendment

In situ treatment not effective for metal above PRGs

Water Depth

Intertidal sediment subject to wind- and vessel-generated waves

Fish receptors forage within first 30 feet water depth

Hydrodynamics

Impacts of strong near-bottom tidal currents (Area III)

Impacts of wave action (Areas IX/X)

Natural Recovery Rate

Timeframe to achieve background concentrations

Strong currents hinder MNR implementation

Constructability

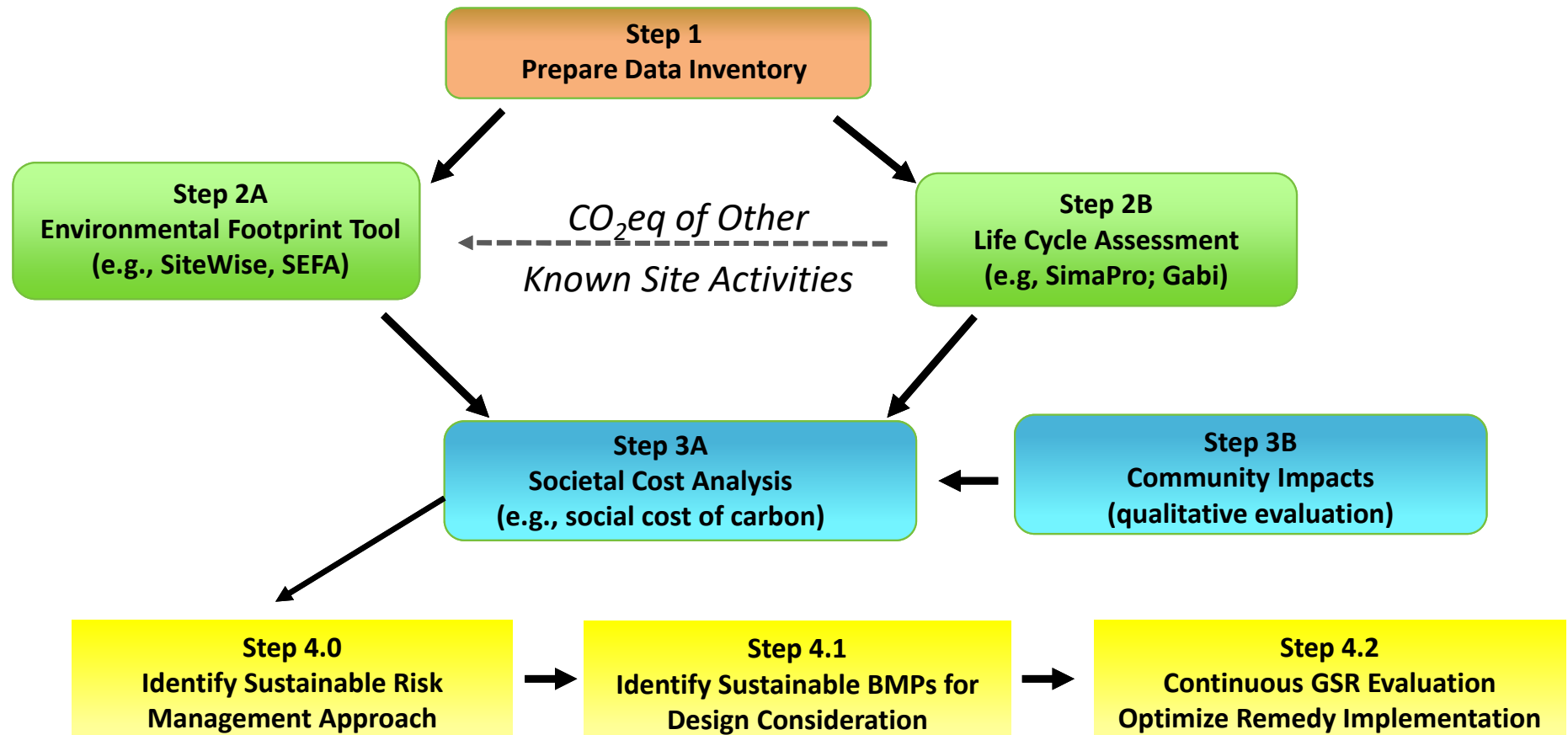
Treatment area's vicinity to shoreline and presence of debris

Resiliency Evaluation

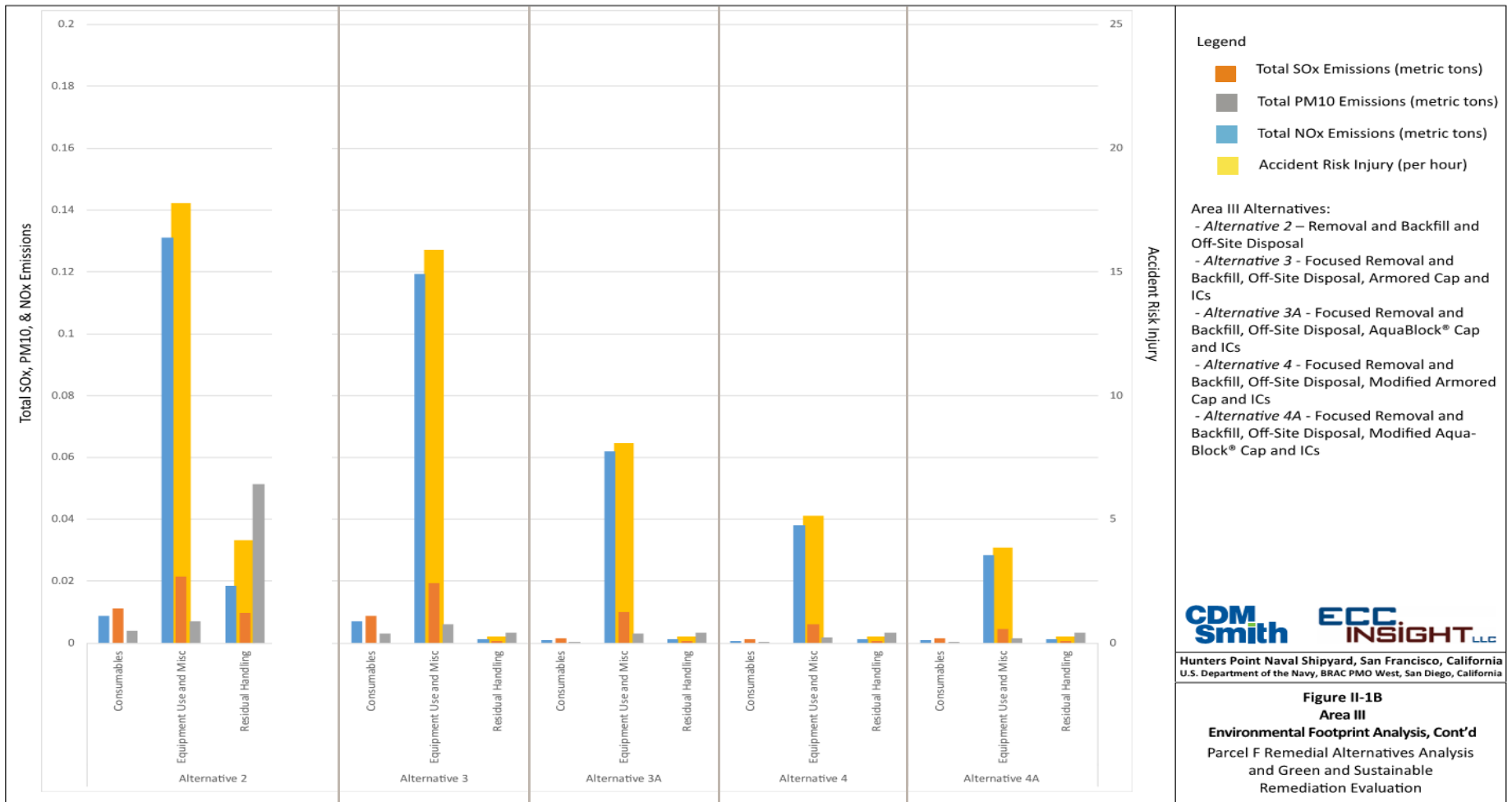
Climate Change Adaptation Technical Fact Sheet:
Contaminated Sediment Remedies

Climate Change Impacts	Remedy Vulnerability	Site-Specific Drivers
<ul style="list-style-type: none">• Increased intensity of wave action and currents• Increased frequency of severe weather events• Sea level rise and storm surge	<ul style="list-style-type: none">• Scour backfill or underlying sediment/amendments• Backfill/amendment/sediment resuspension	<ul style="list-style-type: none">• Water depth, intertidal sediment subject to wind- and vessel-generated waves• Hydrodynamics, impacts of wave action, tidal currents, storm surge, and sea level rise

Sustainability Assessment Process



Environmental Footprint Analysis: Area III



CDM Smith **ECC INSIGHT LLC**
 Hunters Point Naval Shipyard, San Francisco, California
 U.S. Department of the Navy, BRAC PMO West, San Diego, California

Figure II-1B
Area III
Environmental Footprint Analysis, Cont'd
 Parcel F Remedial Alternatives Analysis
 and Green and Sustainable
 Remediation Evaluation

Sustainability Assessment: Area III Technology Assignment

■ Environmental Footprint

- Reduce removal and off-site disposal volume
- Maximize capping footprint, with low footprint consumable materials

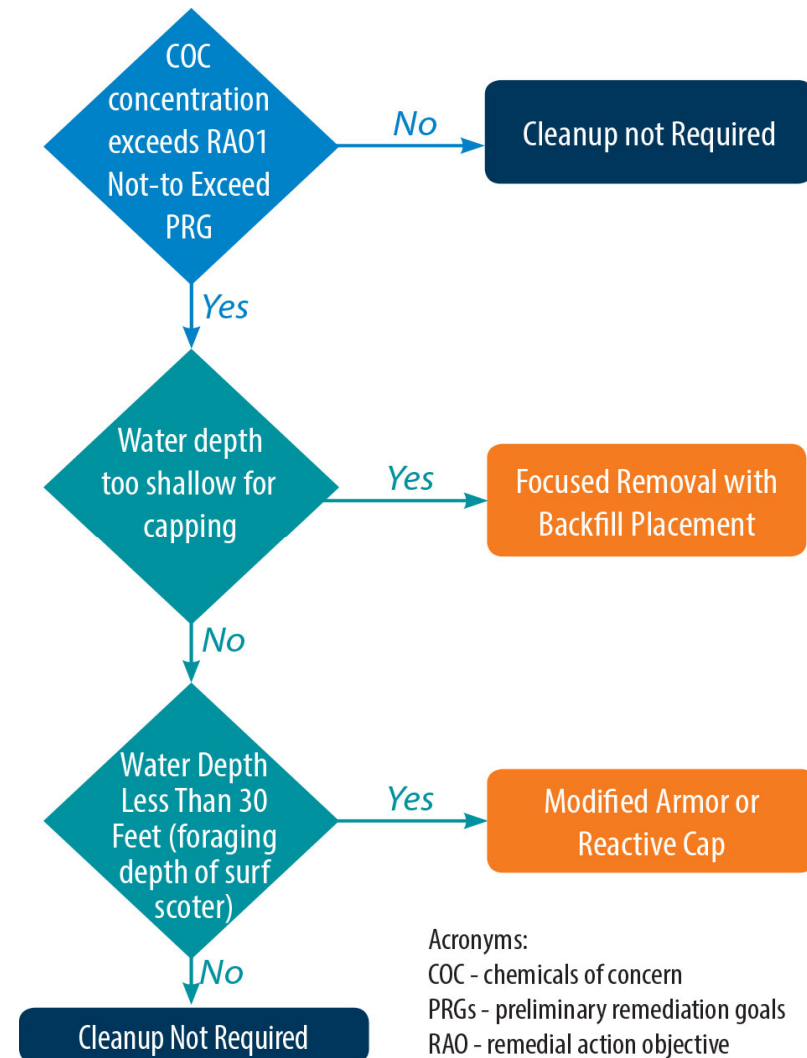
■ Community Evaluation

- Minimize truck hauling activities and landfill space
 - Refine removal zones
 - Barge removed material
 - Reuse excavated sediment

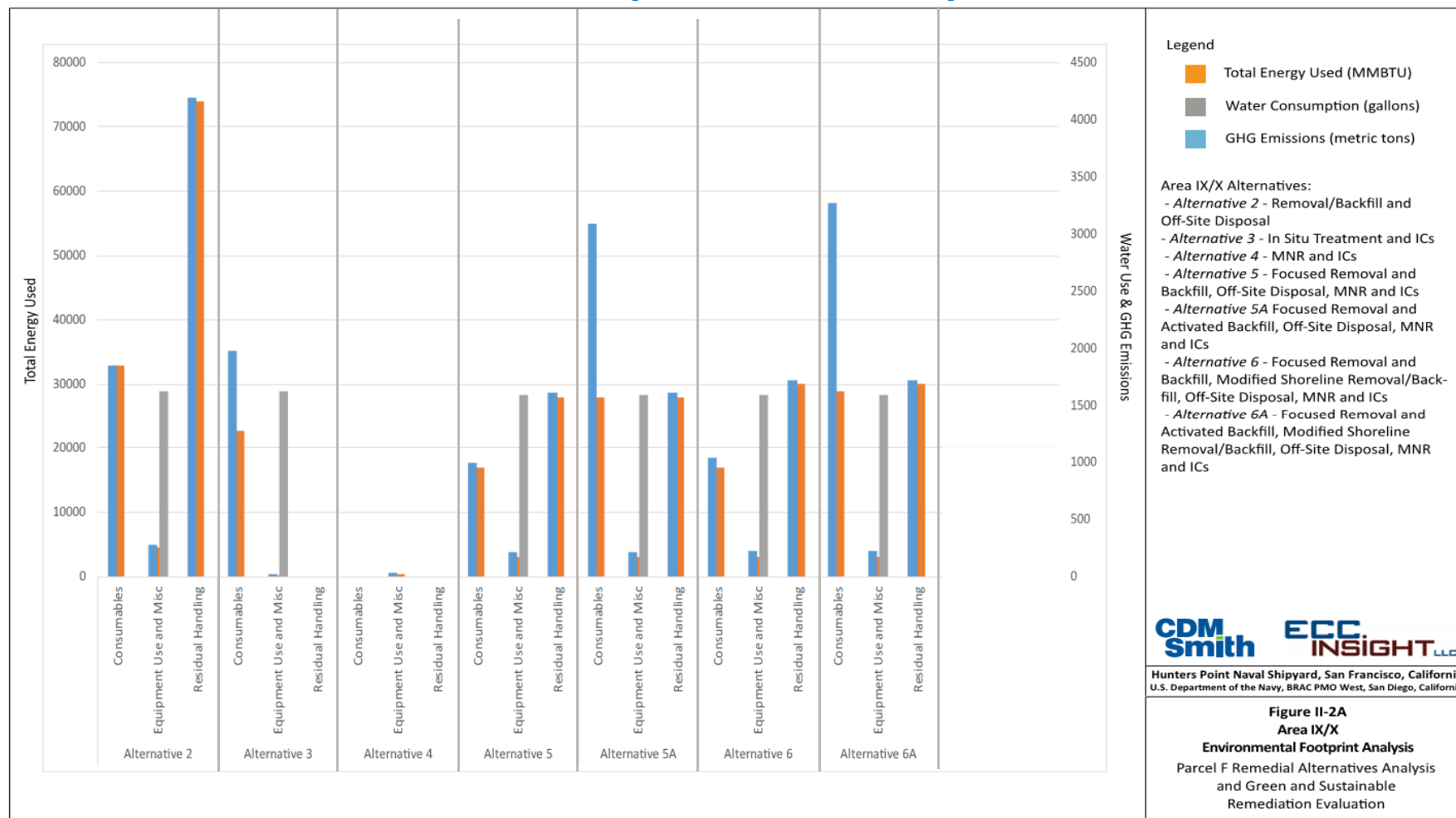


Area III Proposed Remedial Action

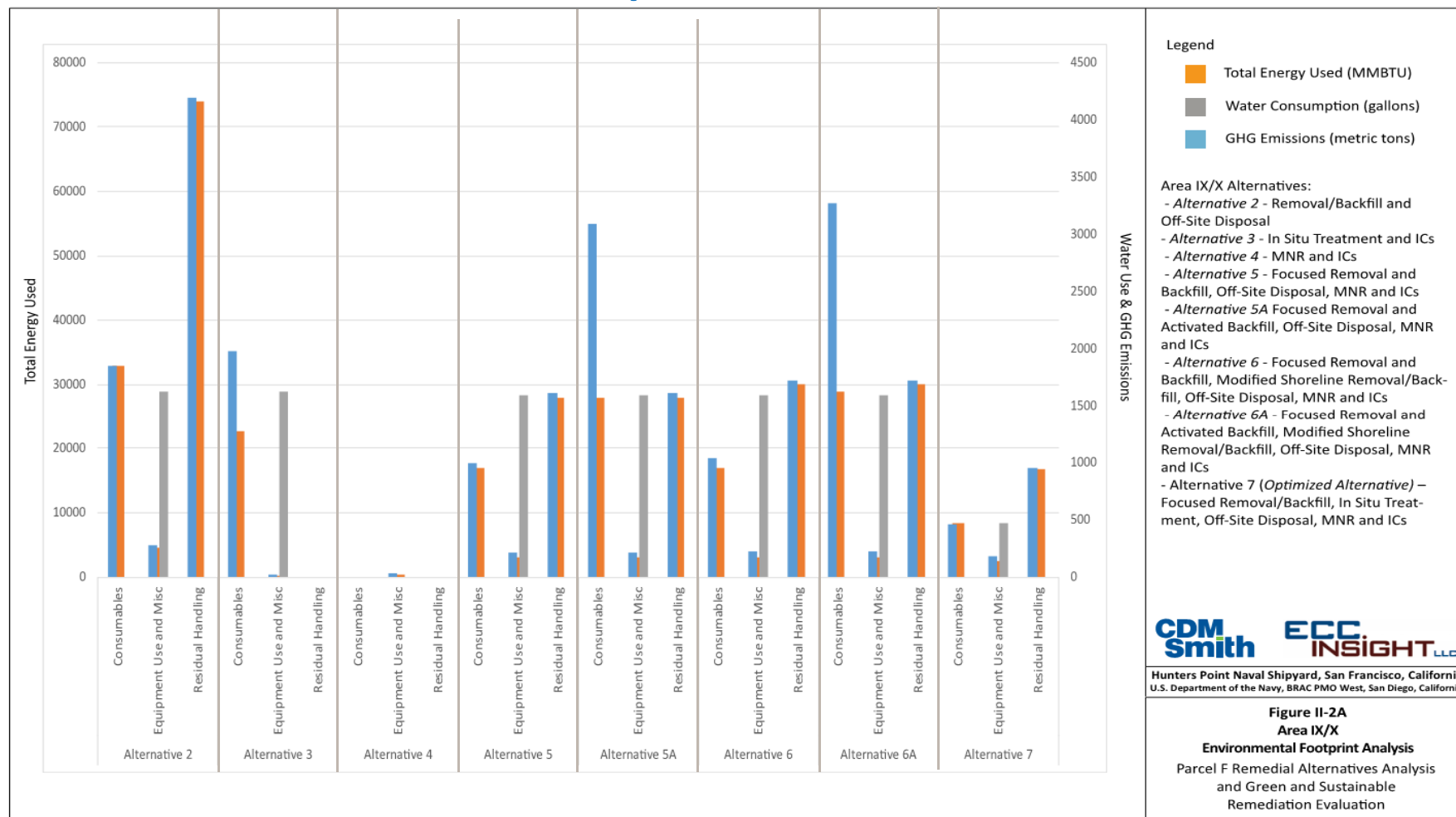
- **Optimization not required**
 - *Based on technology assignment framework site-specific drivers*
- **FS Alternatives 4/4A**
 - Focused removal/backfill
 - Off-site disposal
 - Capping
 - Institutional controls



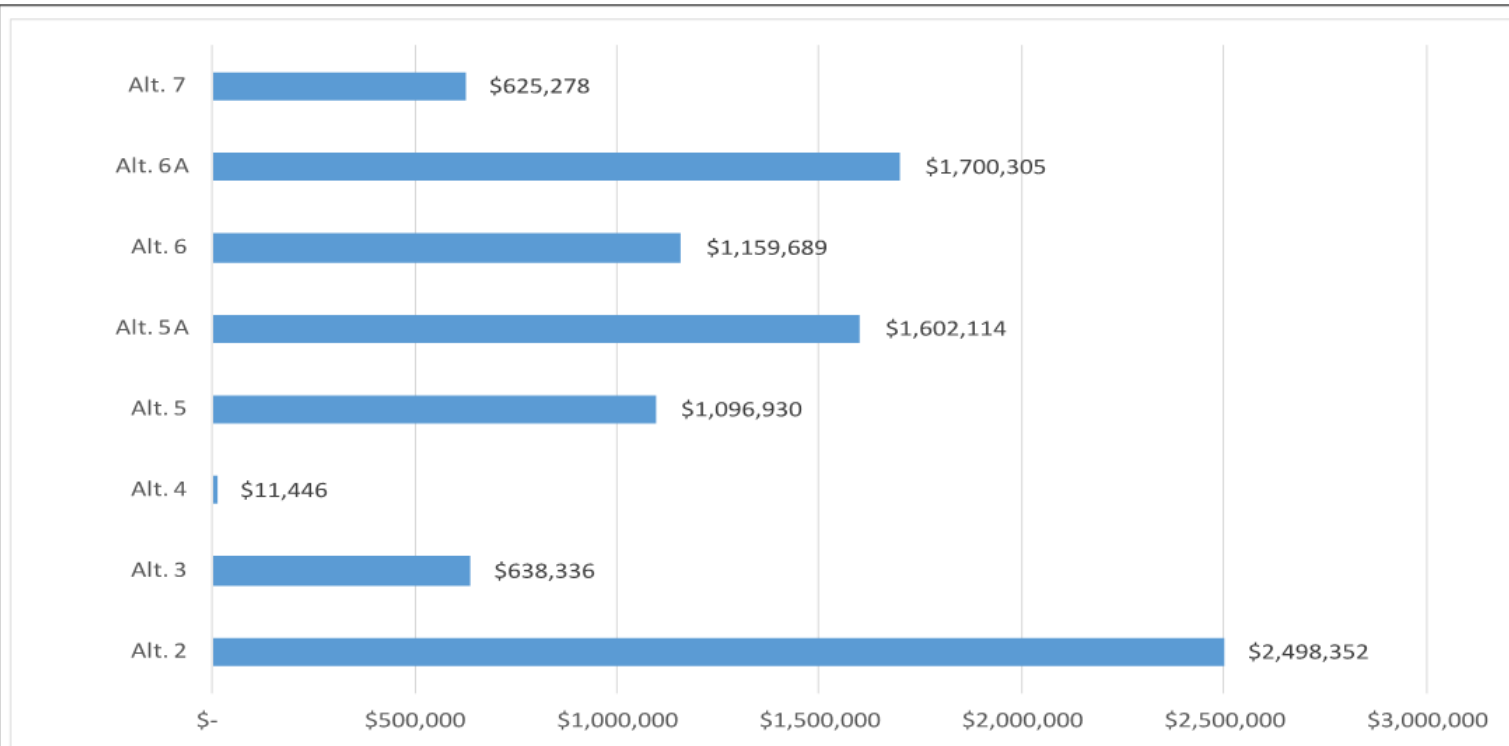
Environmental Footprint Analysis: Areas IX/IX



Areas IX/IX: Alt. 7 Optimized Alternative



Global Monetized Impacts: Area IX/X



Footnote: Global monetized impacts represent financial implications to society due to an incremental increase in emissions (i.e., GHG, NOx, SOx, and PM10) and resource consumption (i.e., energy used).

Legend

Area IX/X Alternatives:

- Alternative 2 - Removal/Backfill and Off-Site Disposal
- Alternative 3 - In Situ Treatment and ICs
- Alternative 4 - MNR and ICs
- Alternative 5 - Focused Removal and Backfill, Off-Site Disposal, MNR and ICs
- Alternative 5A Focused Removal and Activated Backfill, Off-Site Disposal, MNR and ICs
- Alternative 6 - Focused Removal and Backfill, Modified Shoreline Removal/Backfill, Off-Site Disposal, MNR and ICs
- Alternative 6A - Focused Removal and Activated Backfill, Modified Shoreline Removal/Backfill, Off-Site Disposal, MNR and ICs
- Alternative 7 (Optimized Alternative) - Focused Removal/Backfill, In Situ Treatment, Off-Site Disposal, MNR and ICs



Hunters Point Naval Shipyard, San Francisco, California
U.S. Department of the Navy, BRAC PMO West, San Diego, California

Figure II-3B
Area IX/X
Global Monetized Impacts
Parcel F Remedial Alternatives Analysis
and Green and Sustainable
Remediation Evaluation

Sustainability Assessment: Technology Assessment Framework Areas IX/X

■ Environmental Footprint

- Reduce removal and off-site disposal volume
- Maximize *in situ* material footprint, with low footprint consumable materials

■ Optimized Alternative

- Use site-specific drivers to develop multi-component remedy

■ Community Evaluation

- Minimize truck hauling activities and landfill space
 - Refine removal treatment zones
 - Barge/reuse excavated sediment

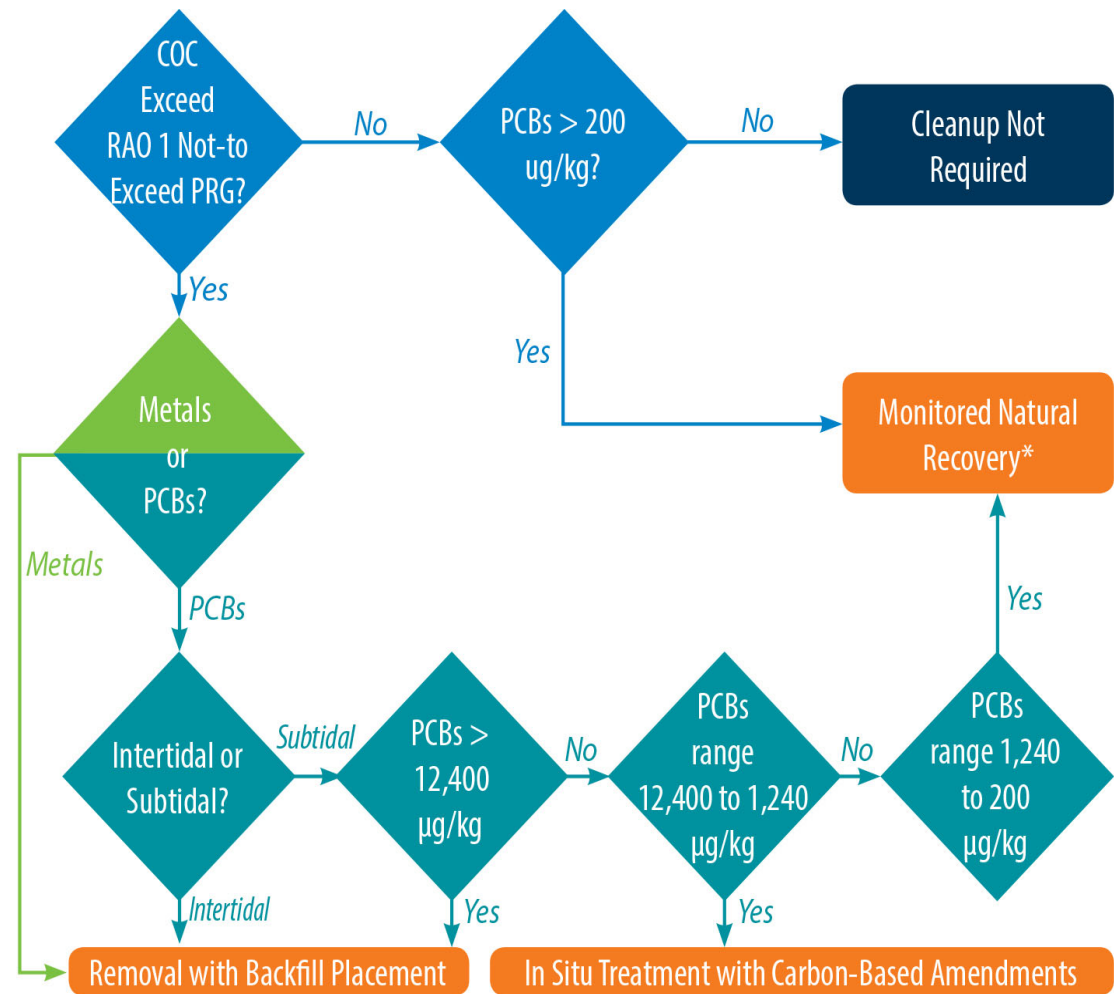
**grey text = same as Area III findings*



Areas IX/X Proposed Remedial Action

■ Optimized Alternative 7

- Focused removal/backfill
- *In situ* treatment
- Off-site disposal
- Monitored natural recovery
- Institutional controls



Continuous Optimization Process: Remedial Design Components

- Integrate sustainable BMPs into design documents
 - Low footprint consumables
 - Limit residual handling and optimize reuse
 - Consider fuel efficiency vehicles
 - Community truck hauling route and remedial action monitoring
 - Stakeholder feedback on proposed plan
- Integrate resiliency adaptation measures
 - Cap and *in situ* amendment settling enhancement
 - Hydrodynamic modeling existing and future design storms
 - Cap/backfill materials enhancement
 - Climate change vulnerability monitoring to evaluate long-term effectiveness



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