Dredging Commercial & Residential Docks along a Federal Shallow-Draft Channel in a Diversely Populated Community
...*It takes Multiple Villages*

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Mike Angis, Haley & Aldrich
Shaun Bootsma, Gahagan & Bryant
April Miller, City of San Rafael

WEDA Pacific Chapter
October 26, 2023

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OUTLINE

1	Background
2	Federal Funding
3	Permitting and Contaminant Management
4	Non-Federal Funding
5	Design and Construction

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San Rafael Creek Dredging Background

OPERATIONS AND MAINTENANCE (O&M)

SAN RAFAEL CREEK
CALIFORNIA

SAN FRANCISCO DISTRICT
SOUTH PACIFIC DIVISION

1 JANUARY 2022
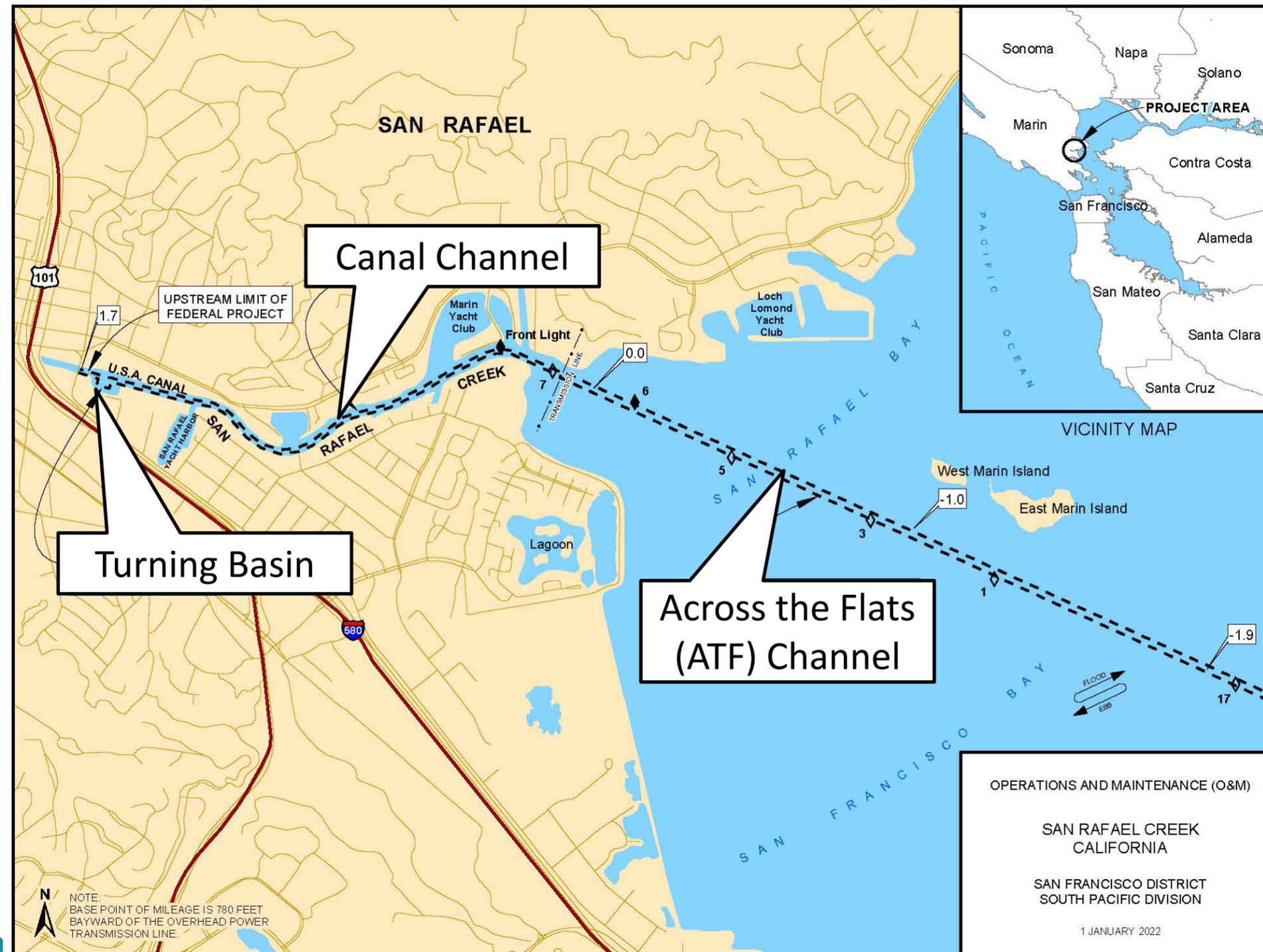
- Authorized for O&M Dredging in 1928
- ATF Channel
  - 2.4 Miles long
  - 100 Feet wide
  - Depth: -8 feet MLLW
- Canal Channel
  - 1.6 Miles long
  - 60 Feet wide
  - Depth: -6 feet wide
- Local Sponsor: The City of San Rafael
- Four Private Yacht Harbors
  - Loch Lomond Yacht Harbor
  - Marin Yacht Harbor
  - Lowrie Yacht Harbor
  - San Rafael Yacht Harbor

San Rafael Creek Dredging Background

San Rafael Creek Dredging Background

Maintenance Dredging History
- Every 4-5 years since 1928

San Rafael Creek Dredging Background

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- Upland fill available until 1991

San Rafael Creek Dredging Background

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- Every 4-5 years since 1928
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- In-Bay aquatic disposal or levee amendment in 2002

San Rafael Creek Dredging Background

Maintenance Dredging History

- Every 4-5 years since 1928
- Upland fill available until 1991
- In-Bay aquatic disposal or levee amendment in 2002
- Partial dredge in 2011
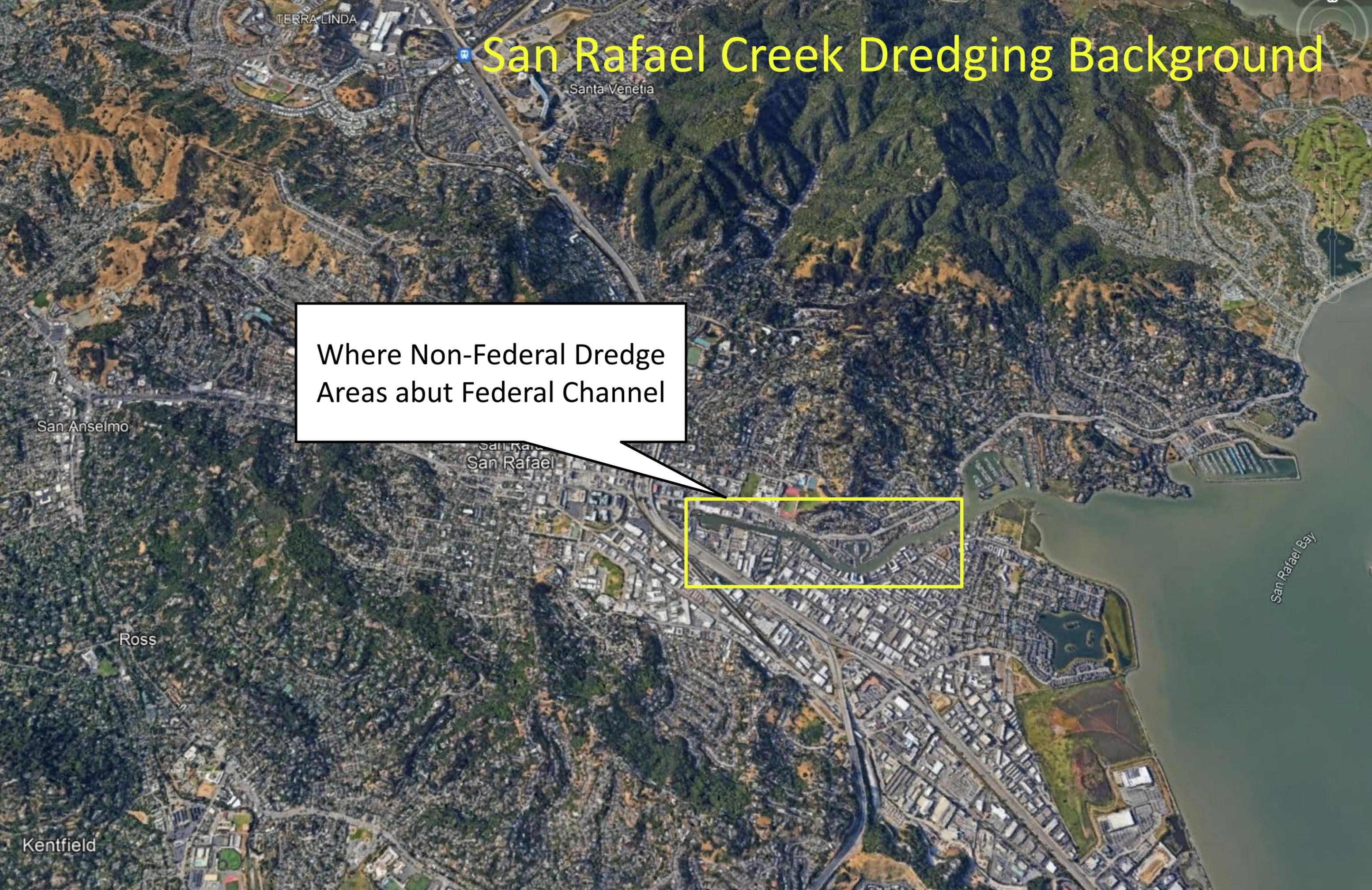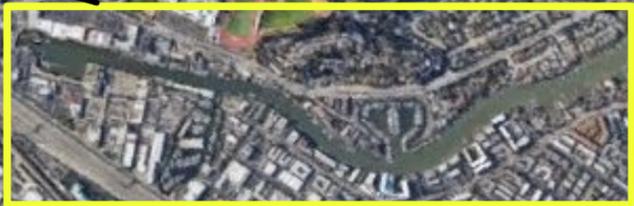 - Only half-way up Canal Channel
  - Only to -4 Ft MLLW

San Rafael Creek Dredging Background
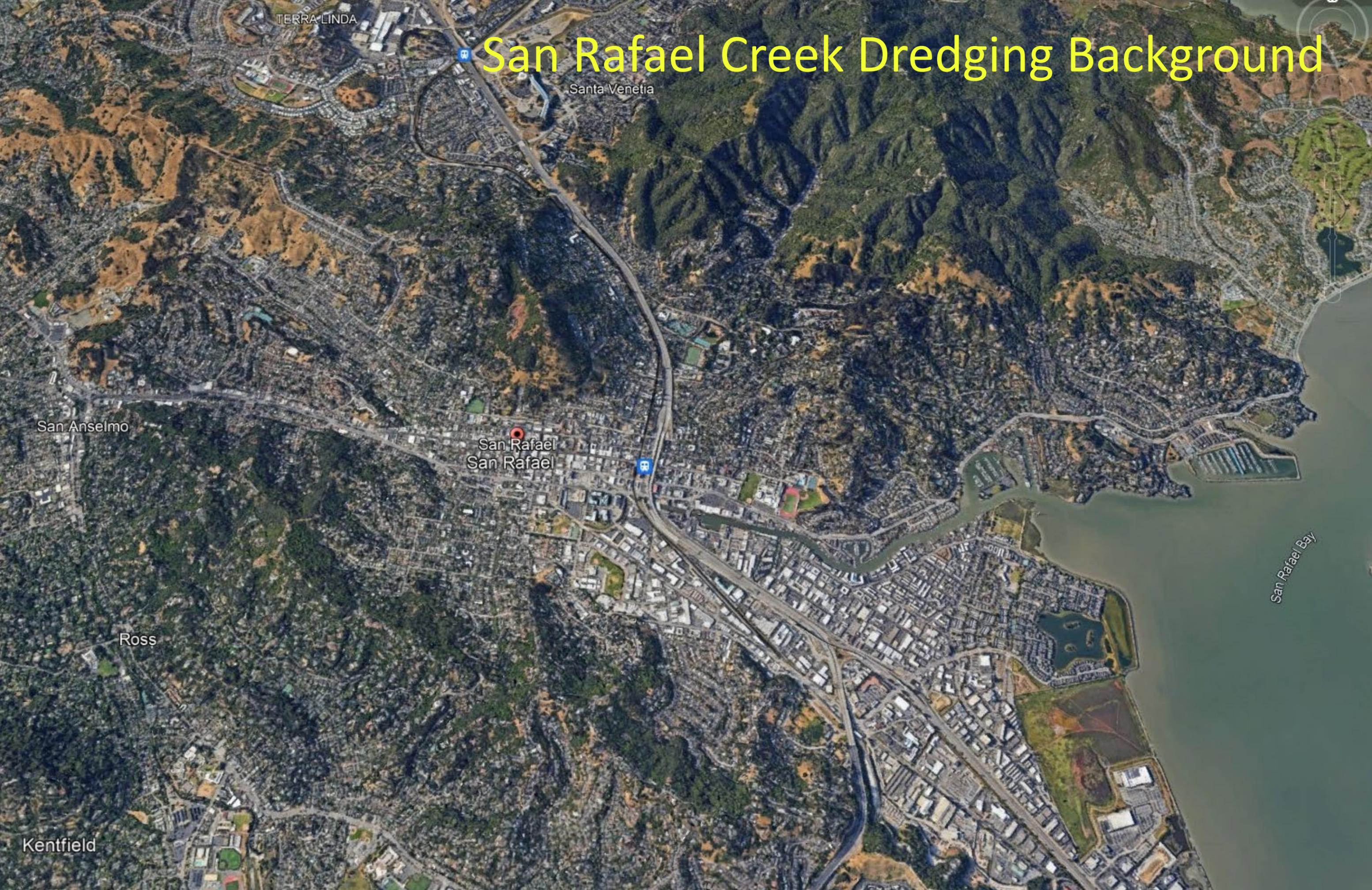
San Rafael Creek Dredging Background

Where Non-Federal Dredge Areas abut Federal Channel

San Rafael Creek Dredging Background

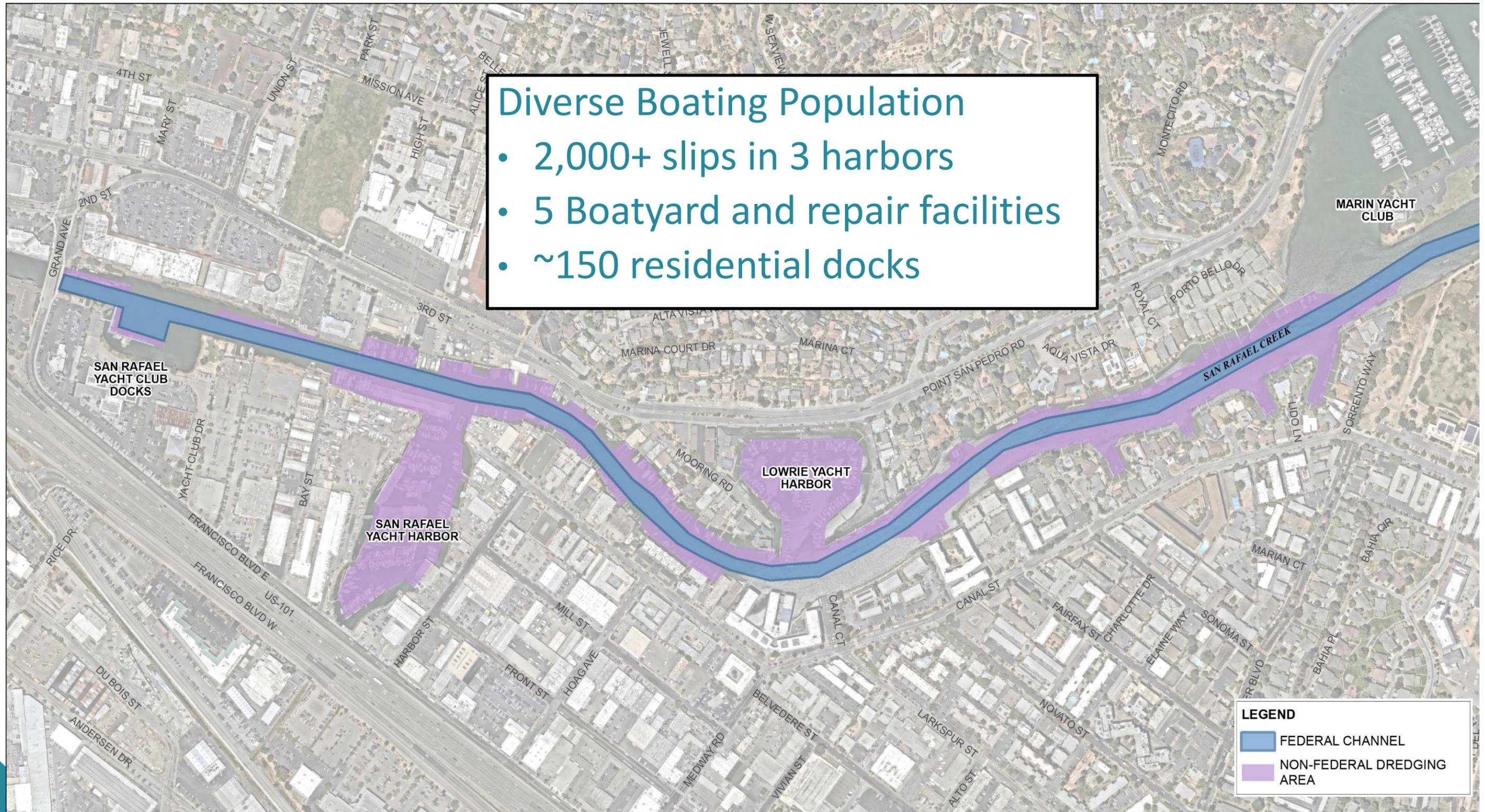# San Rafael Creek Dredging Background

1931

LEGEND

FEDERAL CHANNEL

NON-FEDERAL DREDGING AREA

San Rafael Creek Dredging Background

LEGEND
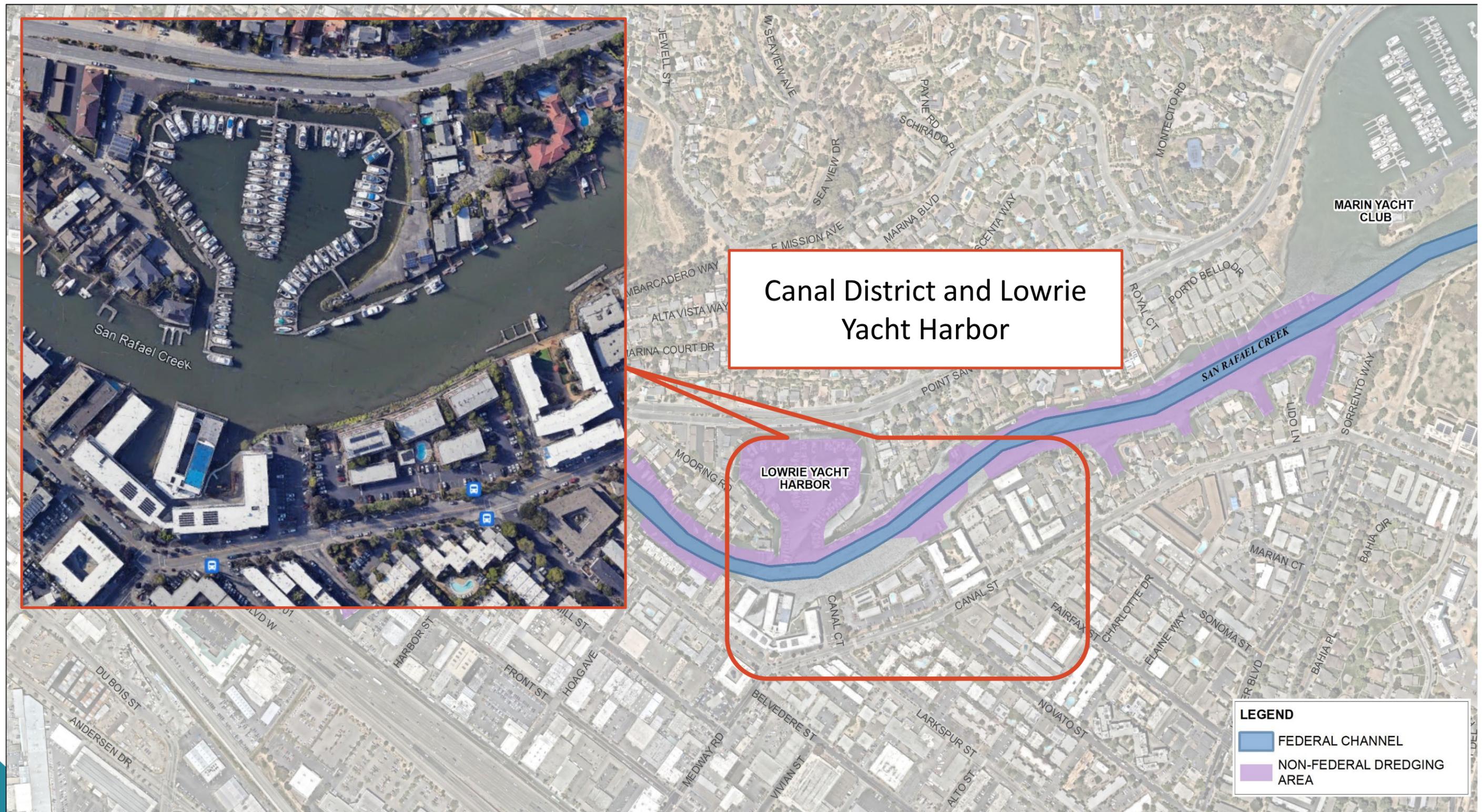- FEDERAL CHANNEL
- NON-FEDERAL DREDGING AREA

San Rafael Creek Dredging Background

Diverse Boating Population
- 2,000+ slips in 3 harbors
- 5 Boatyard and repair facilities
- ~150 residential docks

LEGEND
FEDERAL CHANNEL
NON-FEDERAL DREDGING AREA

San Rafael Creek Dredging Background

Newport Boater's Assoc. and the North Bank

MARIN YACHT CLUB

LEGEND
- FEDERAL CHANNEL
- NON-FEDERAL DREDGING AREA

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San Rafael Creek Dredging Background

Canal District and Lowrie Yacht Harbor

LEGEND
FEDERAL CHANNEL
NON-FEDERAL DREDGING AREA

San Rafael Creek Dredging Background

San Rafael Yacht Harbor and Boat Yards

San Rafael Yacht Club Docks

San Rafael Yacht Harbor

San Rafael Creek

Marin Yacht Club

LEGEND

FEDERAL CHANNEL

NON-FEDERAL DREDGING AREA

San Rafael Creek Dredging Background

San Rafael Yacht Club and Mystery Dock

LEGEND
- FEDERAL CHANNEL
- NON-FEDERAL DREDGING AREA

Federal Funding

Federal Funding

Federal Funding

Federal Funding

- Historic low-cost upland sites made Work Plan inclusion simple.

- Congressional budget earmarks allowed dredging in 2002 & 2011

- Elevated contaminants and regulatory action impacted 2011

  - Recurring legacy contaminants prohibited in-Bay disposal.

  - Low-cost levee amendment option eliminated by regulatory action.

  - Work Plan allocation could only dredge to -4 ft MLLW and nearly half of Canal Channel was not dredged at all.

- Congressional earmarks eliminated in 2012.

Federal Funding

- By 2018, steady-state accretion had been reached:
  - Average Canal Channel depth was -2 ft MLLW
  - Average ATF Channel depth was -4 ft MLLW
- Coalition of boatyards and the Newport Boater's Association formed to lobby the City, Congress and the Corps.
- Earmarks reinstated in 2020… **Federal funding approved!!**
- **Further delay:** Trump Administration released Work Plan on 1/19/21 with ambiguous language

Sediment Contaminants and Regulatory Process

Umbrella Permit Process

- April 2021

- DMMO Consolidated Application

  - Regional Water Board

  - Bay Conservation & Development Commssion. (BCDC)

  - U.S. Army Corps of Engineers (USACE)

- Streambed Alteration Agreement from Cal Fish & Wildlife (CDFW)

- City of San Rafael Tidelands Permit

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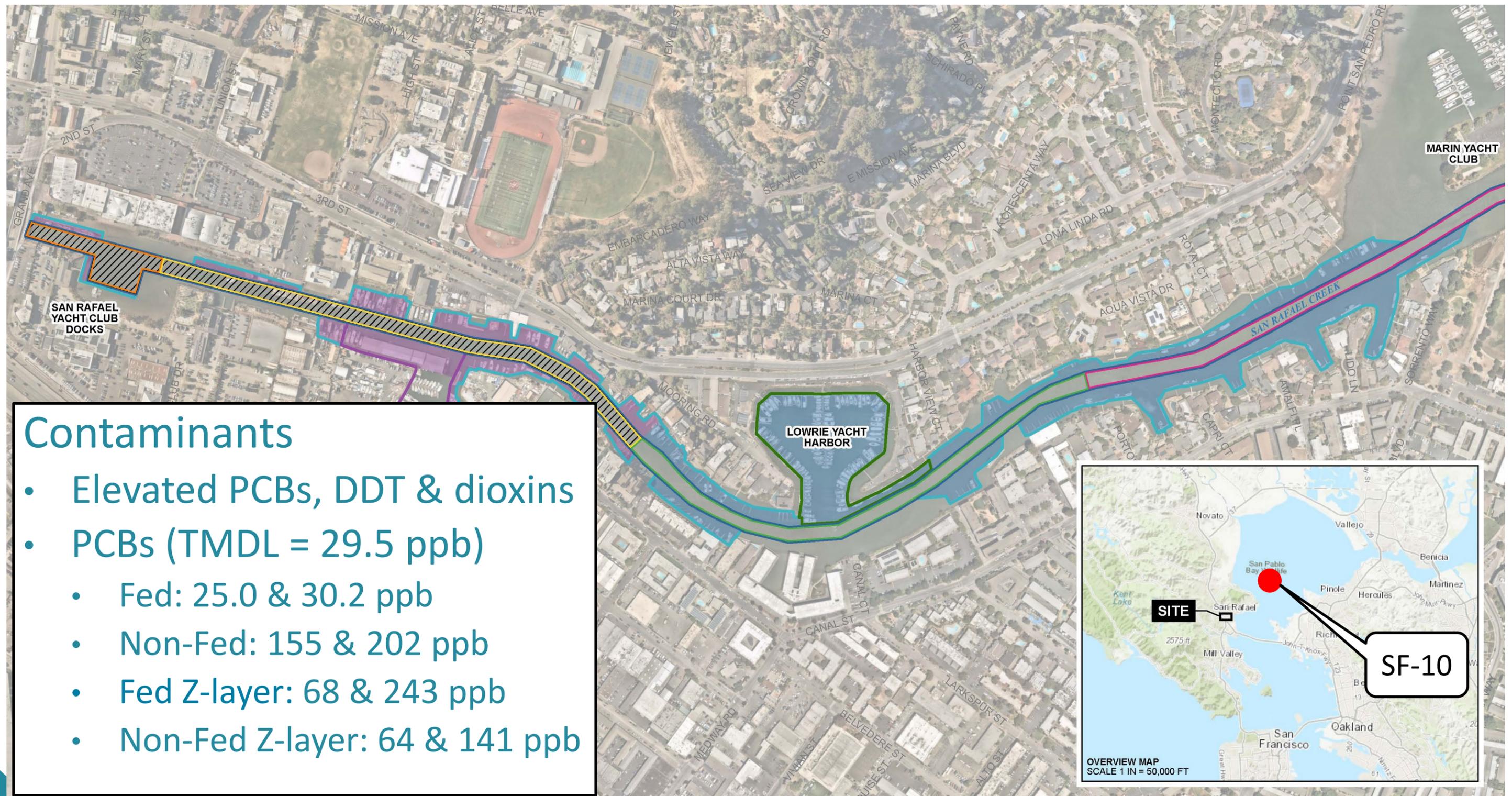# Sediment Contaminants and Regulatory Process

Permit Challenges

- Regional Water Board
  - New (2020) 401 Certification Rule
  - New work dredging confirmation
- BCDC
  - Legal requirement to give permission to the City,
  - ...and demonstrate proof of property interest.
- USACE: LTMS compliance.
- CDFW: Assurance that LTMS compliance provides adequate conservation measures.

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Sediment Contaminants and Regulatory Process

Non-Fed Sample Locations
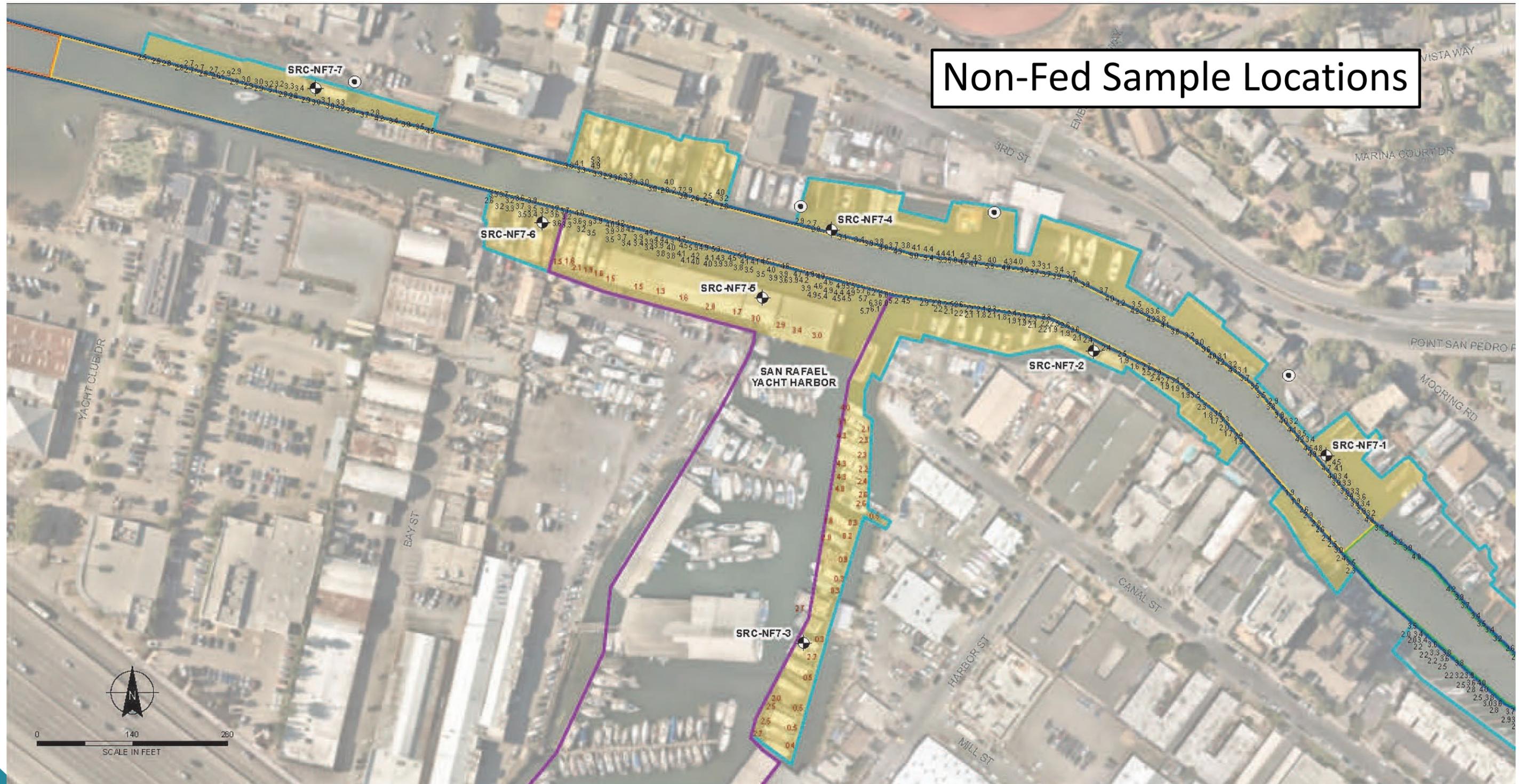
Sediment Contaminants and Regulatory Process
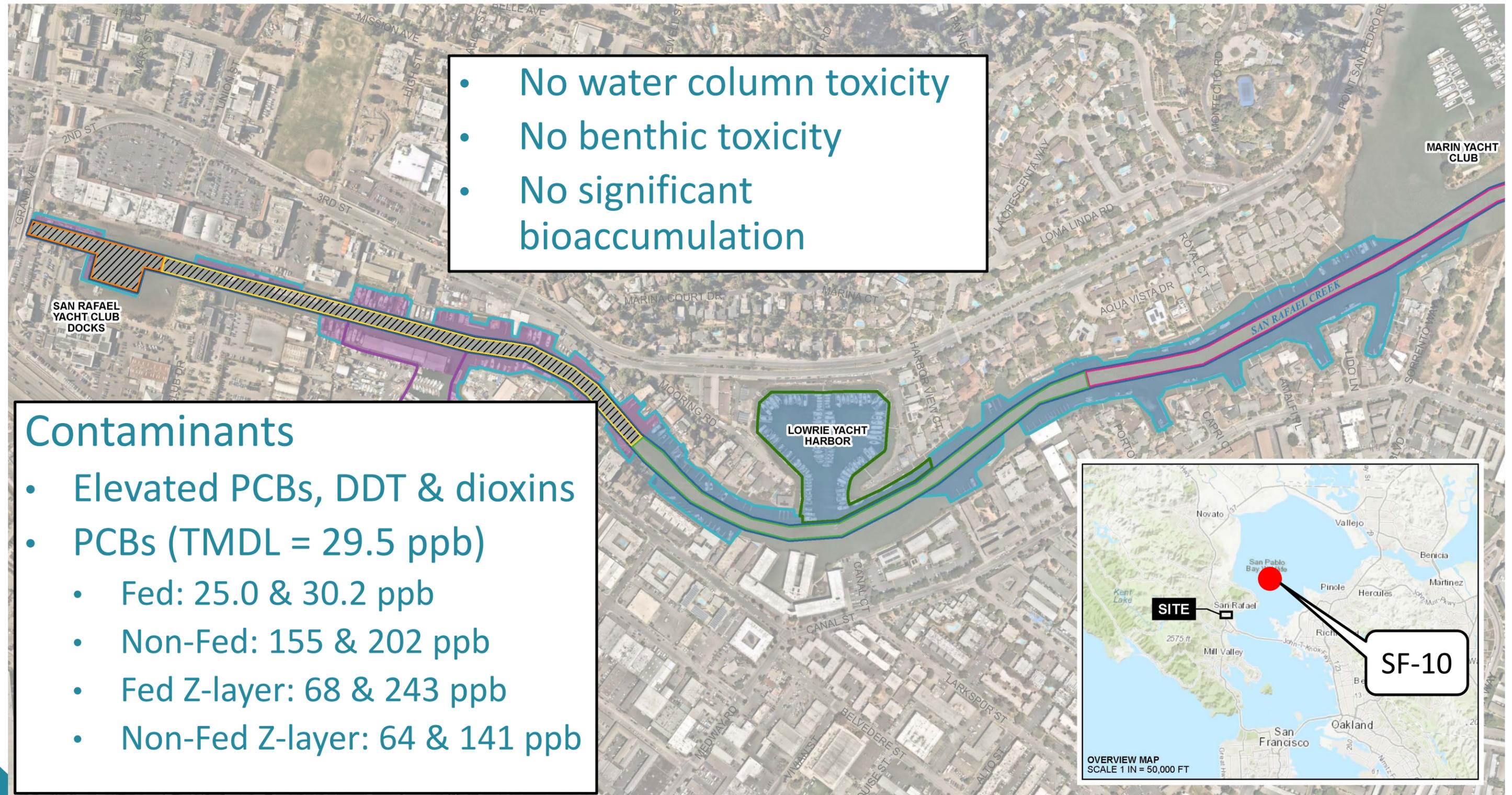

Contaminants

- Elevated PCBs, DDT & dioxins
- PCBs (TMDL = 29.5 ppb)
  - Fed: 25.0 & 30.2 ppb
  - Non-Fed: 155 & 202 ppb
  - Fed Z-layer: 68 & 243 ppb
  - Non-Fed Z-layer: 64 & 141 ppb

Sediment Contaminants and Regulatory Process

- No water column toxicity
- No benthic toxicity
- No significant bioaccumulation

Contaminants

- Elevated PCBs, DDT & dioxins
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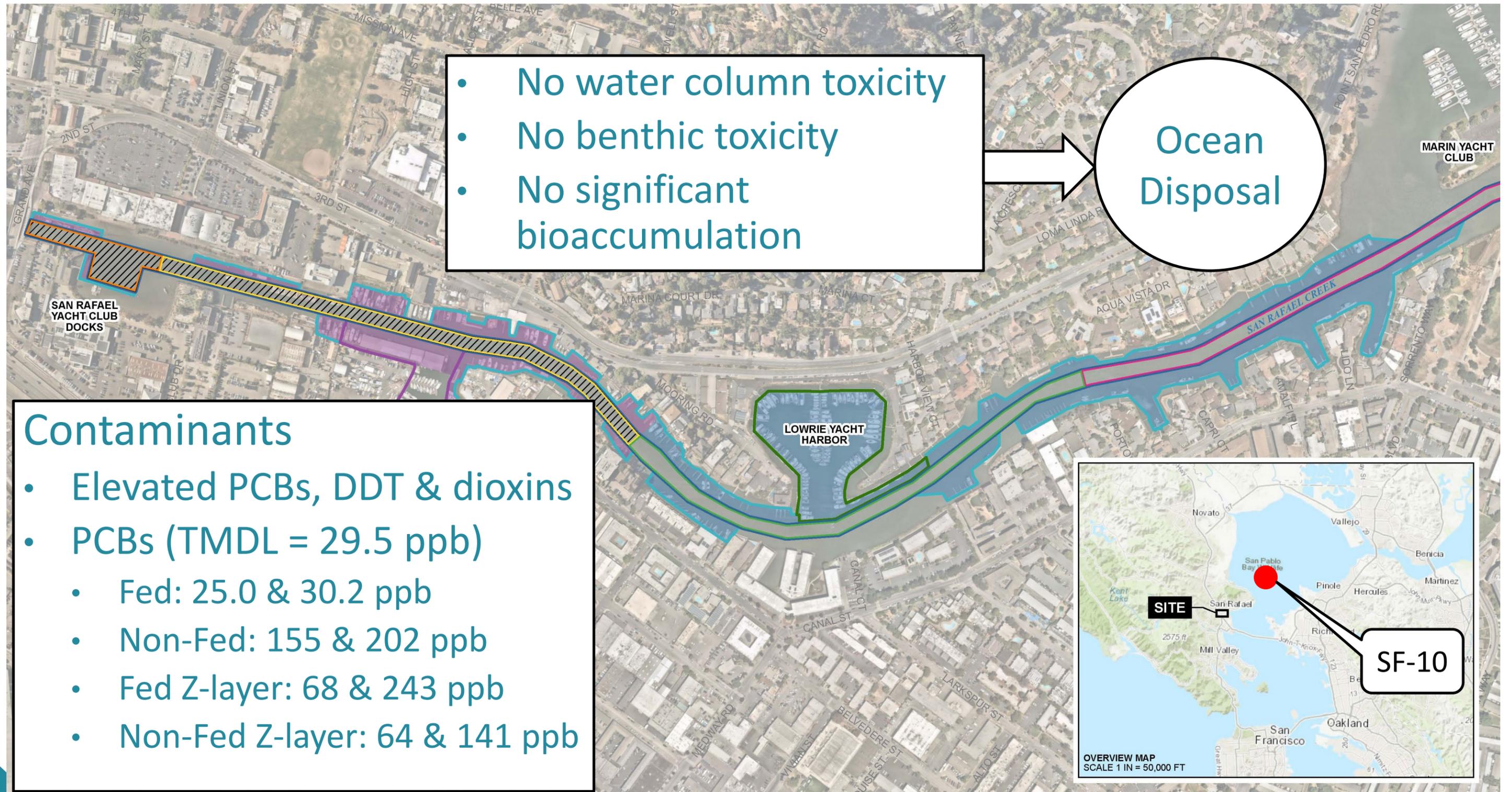   - Non-Fed Z-layer: 64 & 141 ppb

MARIN YACHT CLUB

SAN RAFAEL YACHT CLUB DOCKS

LOWRIE YACHT HARBOR

SITE

SF-10

OVERVIEW MAP
SCALE 1 IN = 50,000 FT

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Sediment Contaminants and Regulatory Process

- No water column toxicity
- No benthic toxicity
- No significant bioaccumulation

Ocean Disposal

Contaminants

- Elevated PCBs, DDT & dioxins
- PCBs (TMDL = 29.5 ppb)
  - Fed: 25.0 & 30.2 ppb
  - Non-Fed: 155 & 202 ppb
 - Fed Z-layer: 68 & 243 ppb
  - Non-Fed Z-layer: 64 & 141 ppb

SF-10

OVERVIEW MAP
SCALE 1 IN = 50,000 FT

Sediment Contaminants and Regulatory Process

- No water column toxicity
- No benthic toxicity
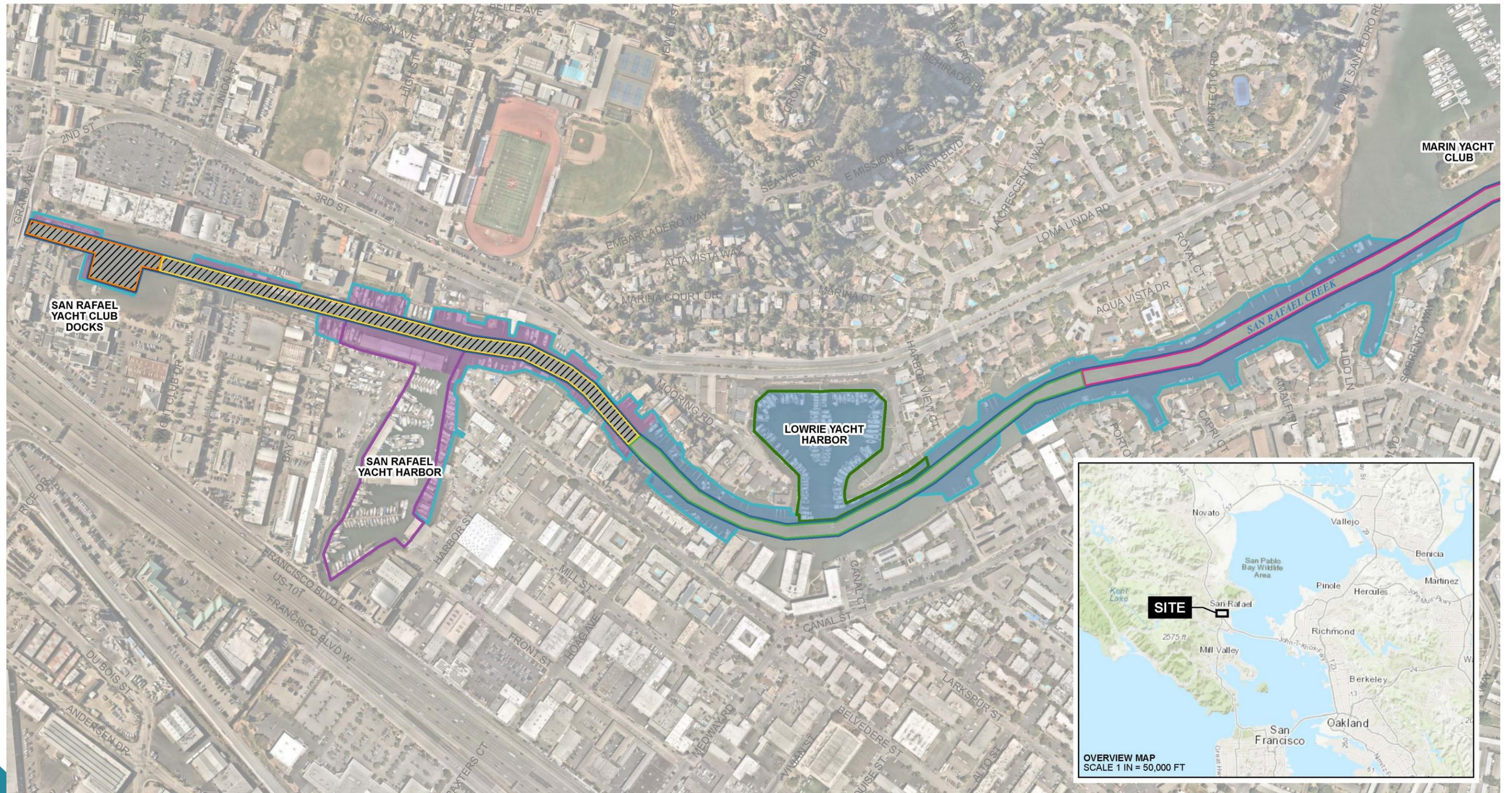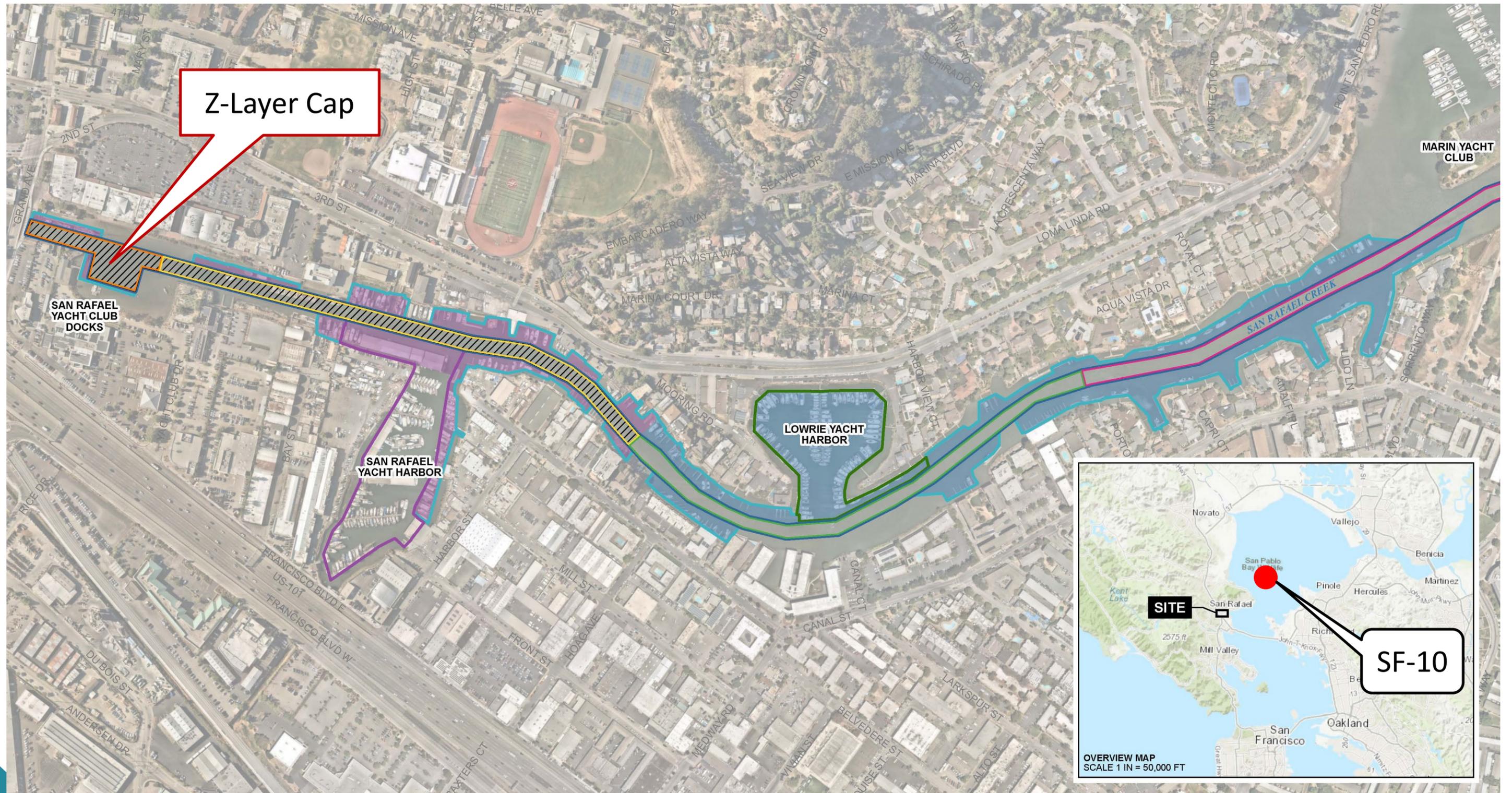- No significant bioaccumulation

→ Ocean Disposal

Contaminants

- Elevated PCBs, DDT & dioxins
- PCBs (TMDL = 29.5 ppb)
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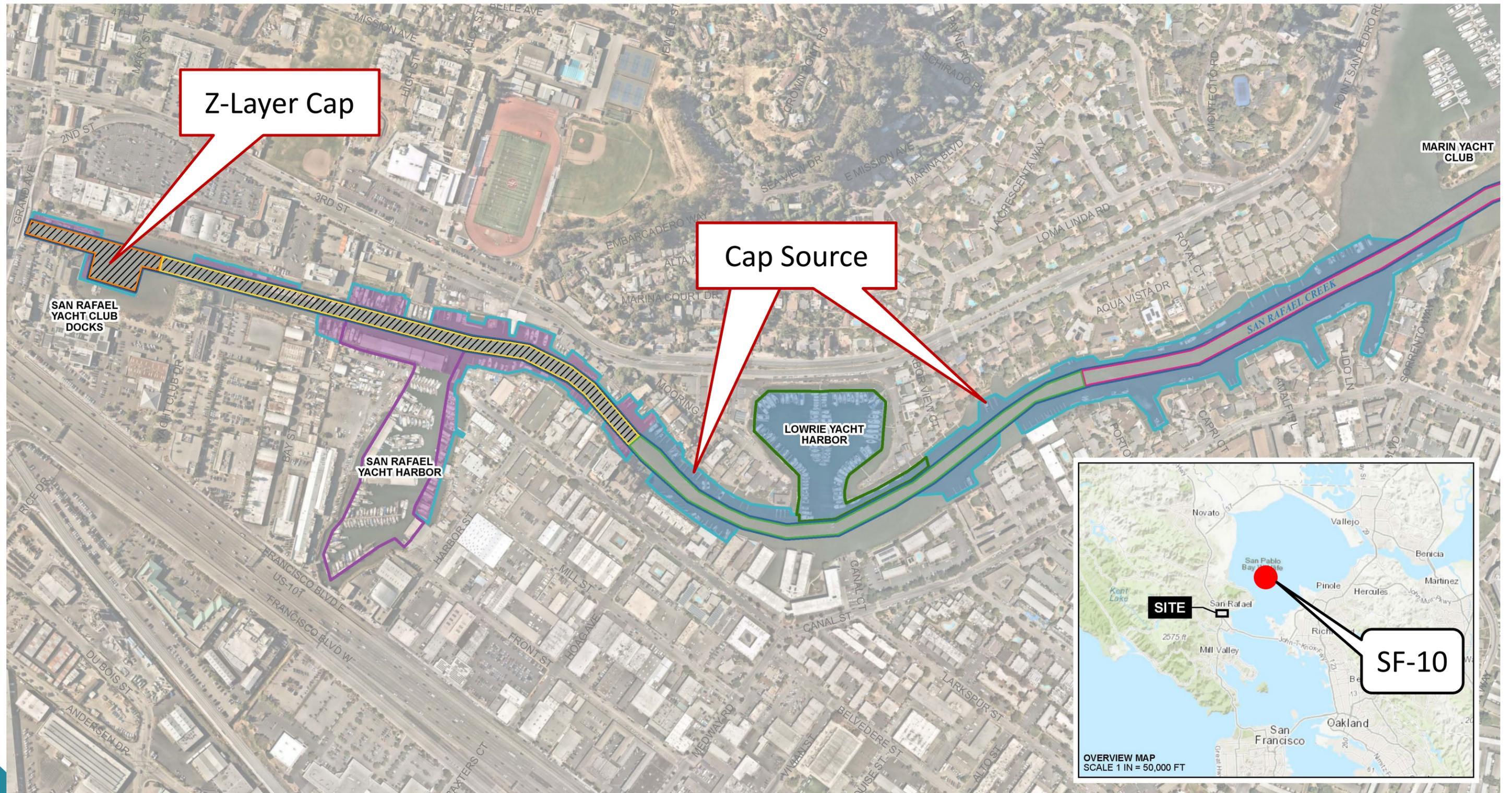 - Fed Z-layer: 68 & 243 ppb
  - Non-Fed Z-layer: 64 & 141 ppb

SF-10

OVERVIEW MAP
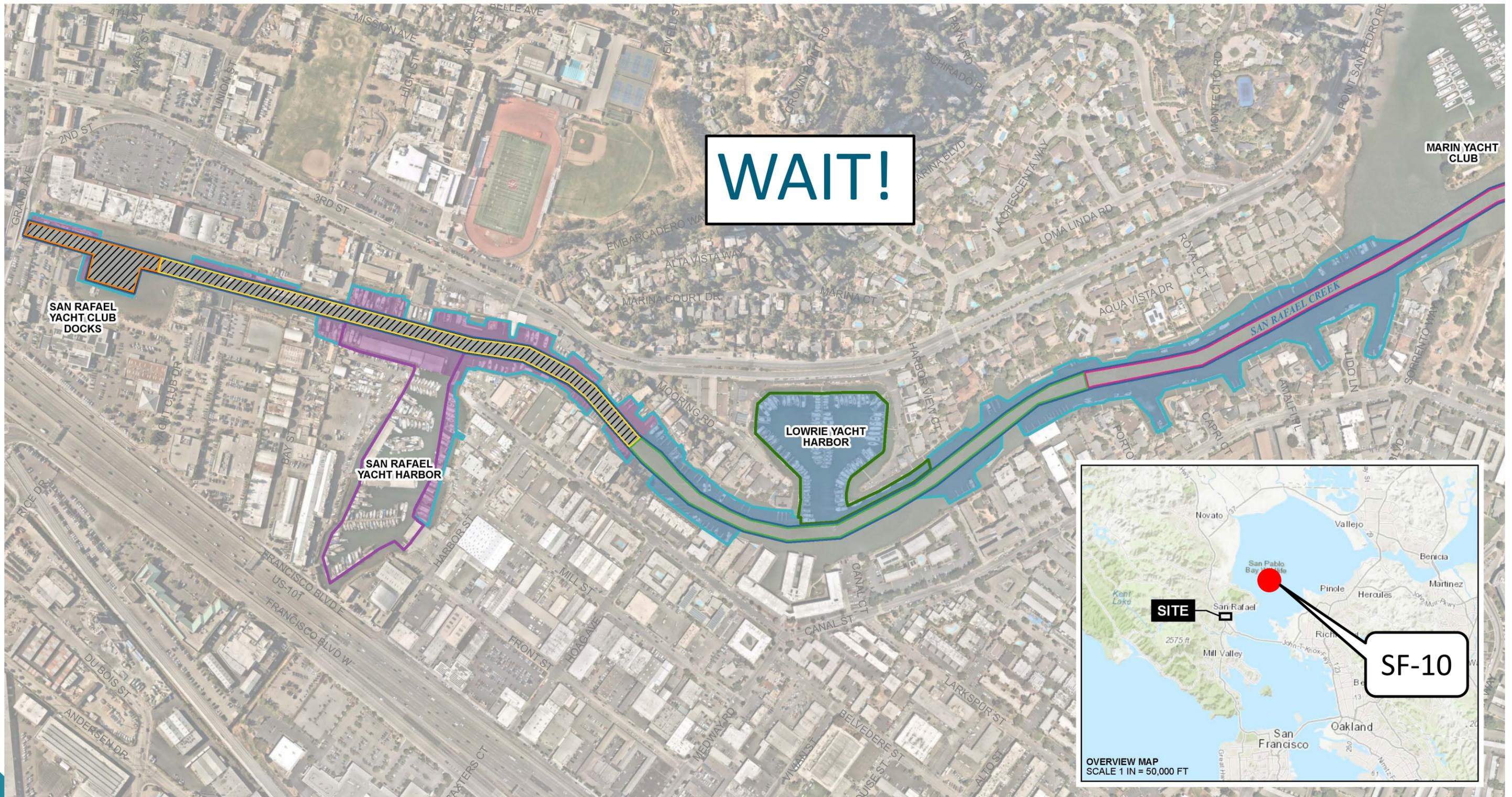SCALE 1 IN = 50,000 FT

30

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Sediment Contaminants and Regulatory Process

Sediment Contaminants and Regulatory Process

# Sediment Contaminants and Regulatory Process

Sediment Contaminants and Regulatory Process

WAIT!
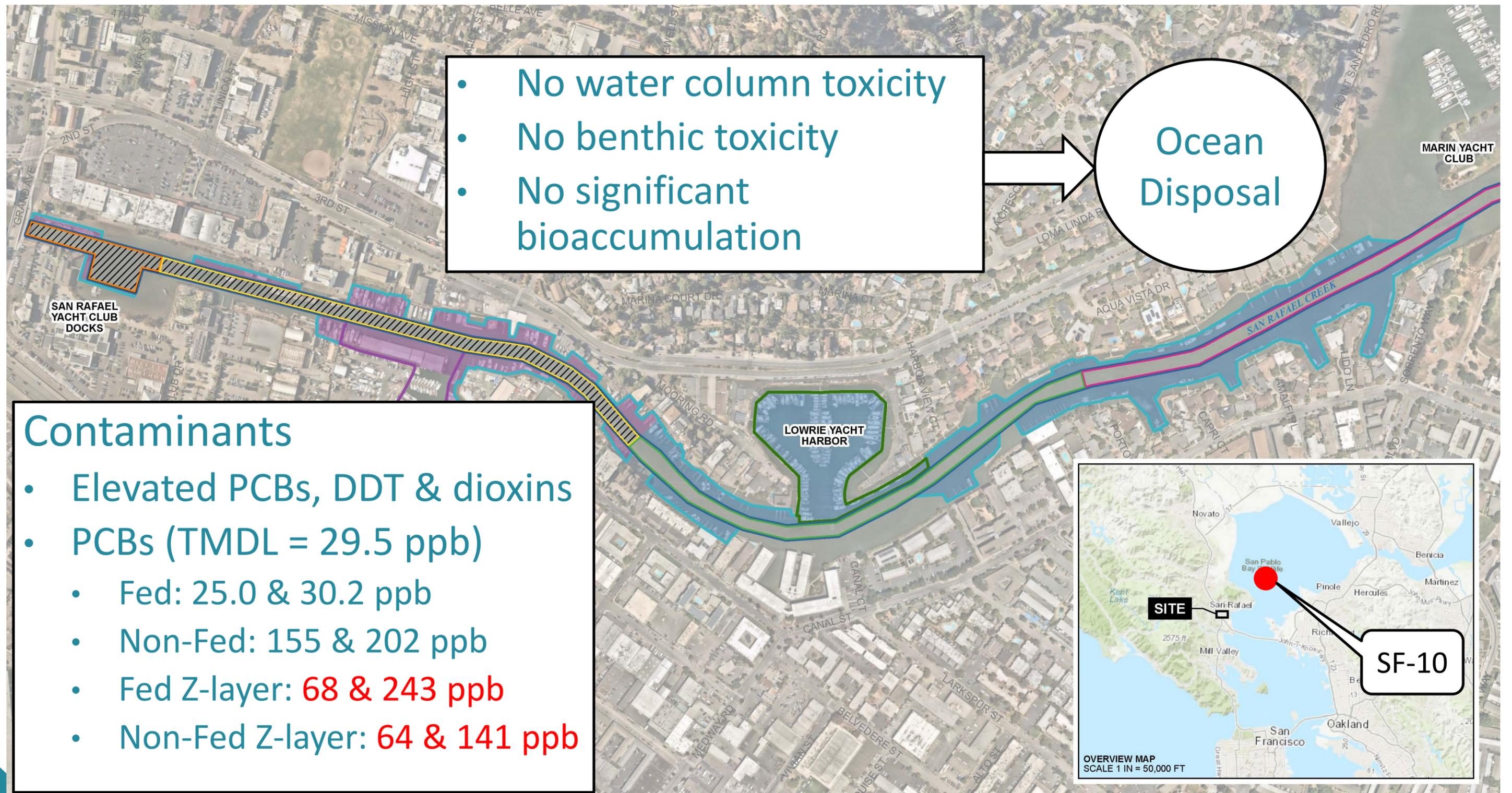
Sediment Contaminants and Regulatory Process

- More USACE testing requested due to agency rep. observation of upstream construction activity.
- Surface sediments showed no significant increase in contaminant concentrations.
- Two-month delay.

Non-Federal Funding

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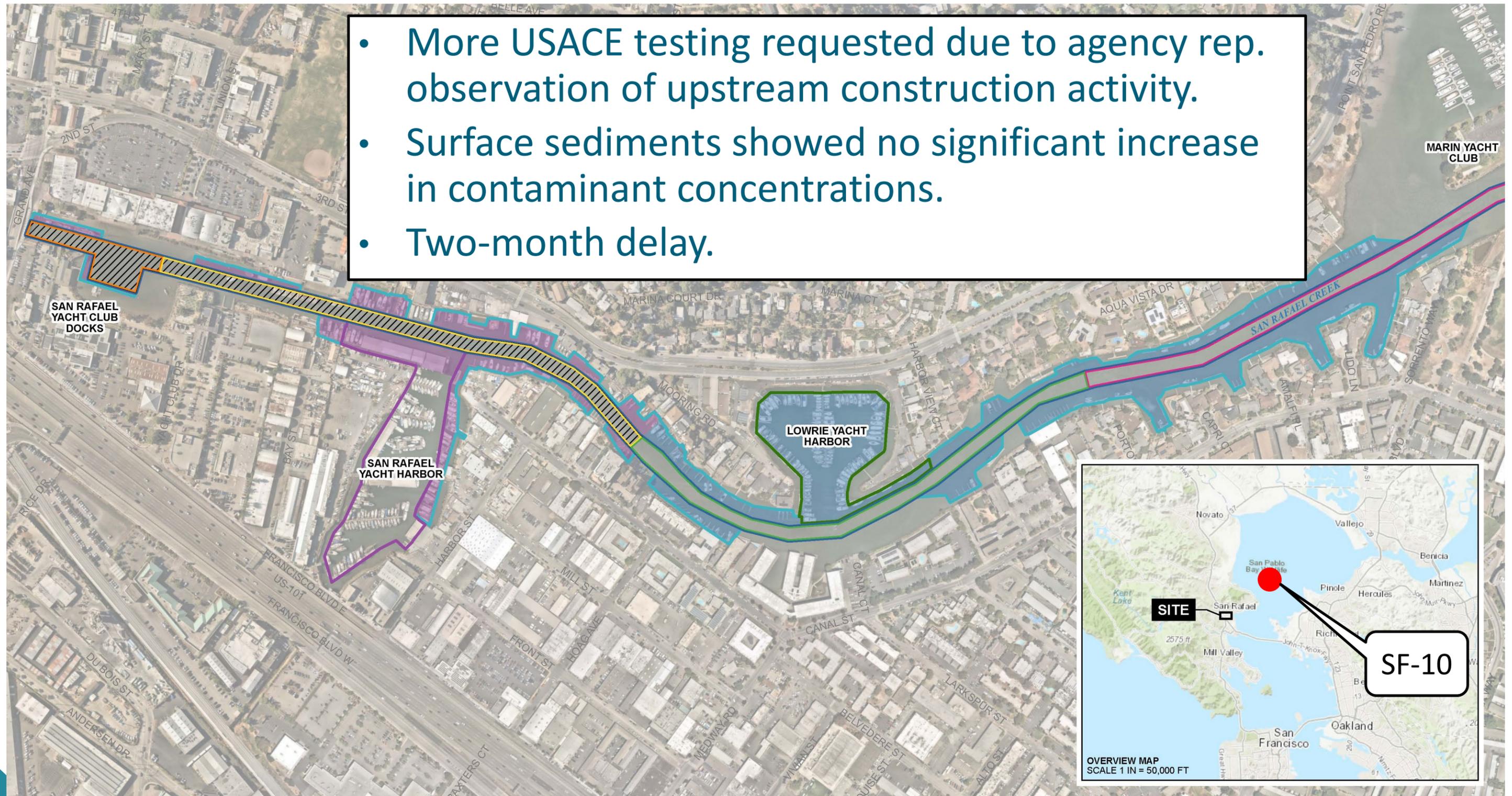
Non-Federal Funding

Piggyback Approach

- Entailed waiting for USACE testing results.

- ..and waiting for USACE contract execution.

- Abbreviated solicitation led to City contracting with USACE contractor.

- Blended Ocean and In-Bay unit rates applied to volumes at individual docks.

- Multiple downstream drop-outs.

- Use of permit database to solicit individual dock payments.

- Areas between non-participating docks and Federal Channel

- All commitments and payments received as contractor was half-way up ATF Channel.

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Design & Construction

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Design & Construction
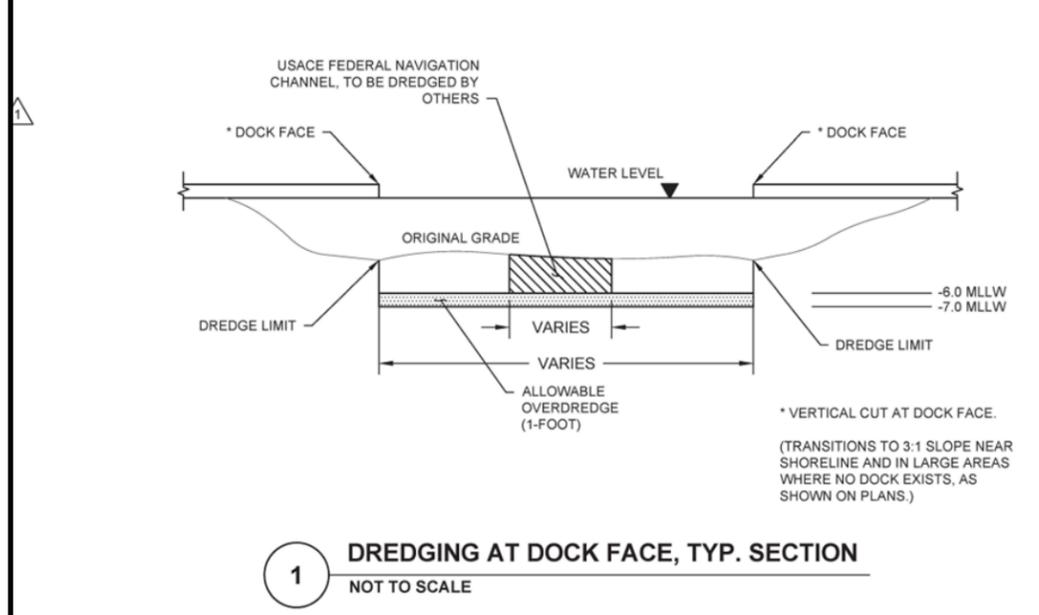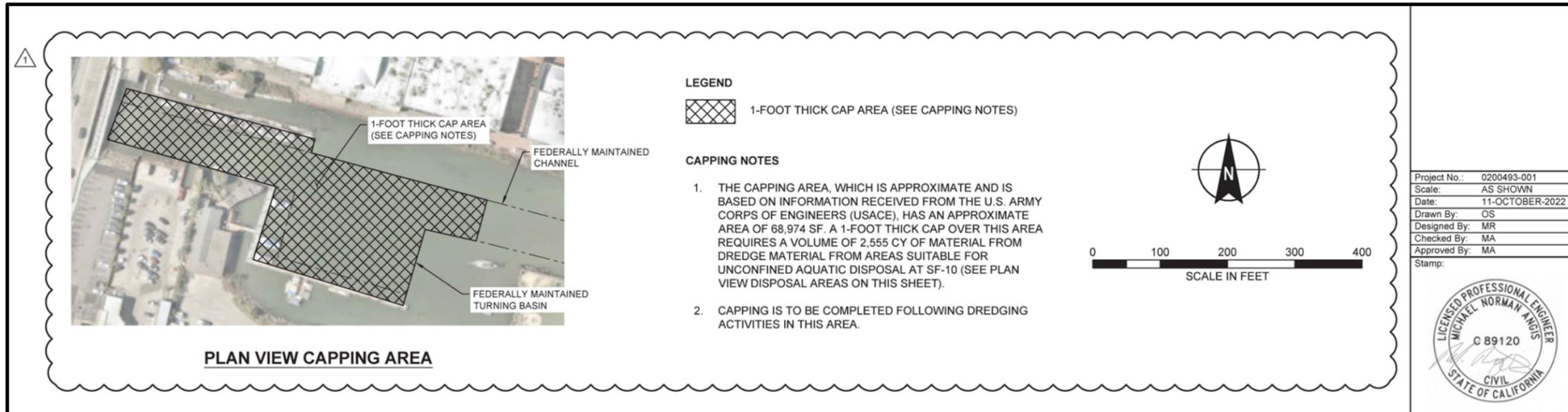
Design Challenges
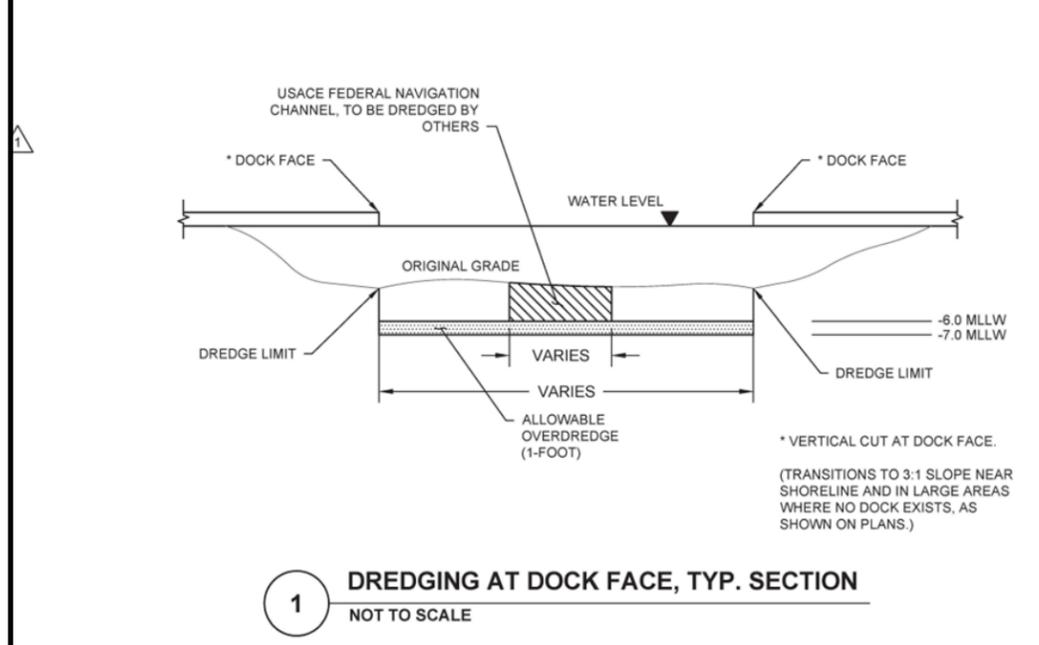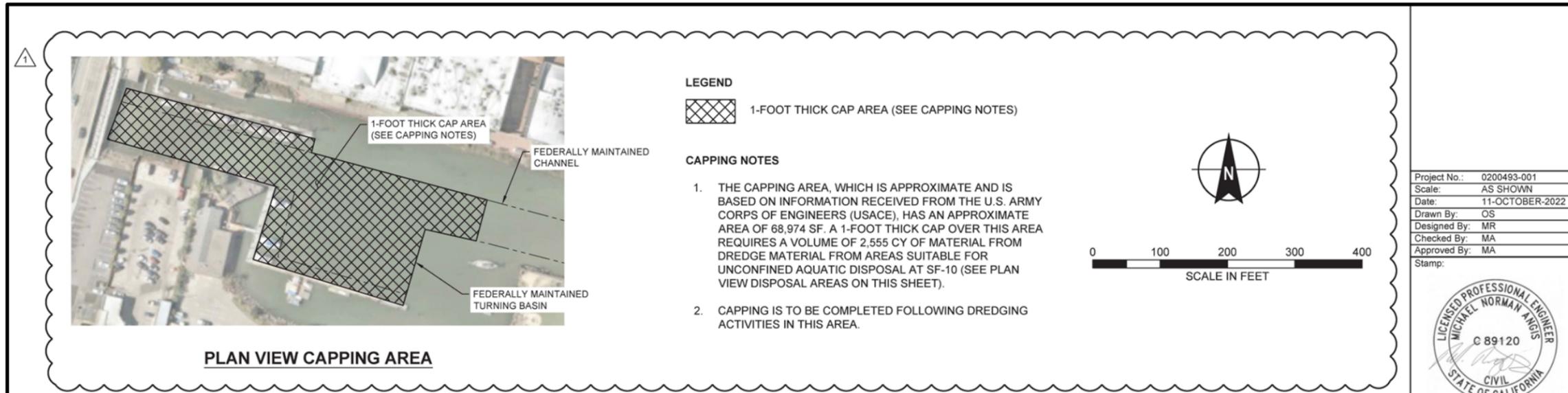
- Property lines vs. dredge area assignment.
- Area between Fed Channel & docks varied widely.
- Changing boundary conditions as owners opted in and out.
- Conflicting information regarding spatial configuration of Federal Channel.
- Different tidal benchmarks used by Federal and Non-Federal surveys.

Design & Construction

PLAN VIEW CAPPING AREA

LEGEND

1-FOOT THICK CAP AREA (SEE CAPPING NOTES)

CAPPING NOTES

1. THE CAPPING AREA, WHICH IS APPROXIMATE AND IS BASED ON INFORMATION RECEIVED FROM THE U.S. ARMY CORPS OF ENGINEERS (USACE), HAS AN APPROXIMATE AREA OF 68,974 SF. A 1-FOOT THICK CAP OVER THIS AREA REQUIRES A VOLUME OF 2,555 CY OF MATERIAL FROM DREDGE MATERIAL FROM AREAS SUITABLE FOR UNCONFINED AQUATIC DISPOSAL AT SF-10 (SEE PLAN VIEW DISPOSAL AREAS ON THIS SHEET).

2. CAPPING IS TO BE COMPLETED FOLLOWING DREDGING ACTIVITIES IN THIS AREA.

DREDGING AT DOCK FACE, TYP. SECTION
NOT TO SCALE

Design Solutions

- City agreed to dredge any substantial shoals off non-participating docks.

- Created artificial elevation points at dredge area edge to interpolate and fully overlap bathymetric surface.

- Open communication with Corps and fed contractor.
  - Obtained federal bathymetry and surveyed overlapping areas to compare and verify data consistency.
  - Tied non-federal control points to USACE tidal benchmark.
  - Adjusted non-fed datum using USACE conversion from NAVD88 to MLLW.

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Design & Construction

Construction Challenges

- Schedule impacts
  - Narrow slips
  - Equipment availability
  - Sloughing/No sloughing
  - Disposal site closure
- Extended hours → Noise complaints
- Cap placement and source material.

Design & Construction

Construction Challenges
- Boat movement
- Narrow passageways

San Rafael Creek

San Rafael Yacht Harbor

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Mission Accomplished!

What's Ahead?

What's Ahead?

- Beneficial reuse at Tiscornia Marsh?
- Restore 5-year maintenance cycles?
- Reduced contaminants?
- Stream-lined episode implementation. ✓

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What's Ahead?

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QUESTIONS?
SUGGESTIONS?
(See me at the bar)

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