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Groundwater Resources Association
2nd Annual Western Groundwater Congress

September 19, 2019

Transforming an Oil Field Waste Disposal Facility into Residences and Habitat

Outline

- Background
- History of Regulatory and Remedial Orientations
  - FS/RAP
    - Soil
    - Groundwater
    - Vapor
  - Preliminary Remedial Action Completion Report (PRACR)
  - California Land Reuse Revitalization Act (CLRRA)
- Long-Term Stewardship and Financial Assurance

Project setting indicates valuable property

- Valuable property ¼ mile from ocean
- Infill property surrounded by greenspace agricultural, parks, and residential

RWQCB lead 1996 RAP and EIR

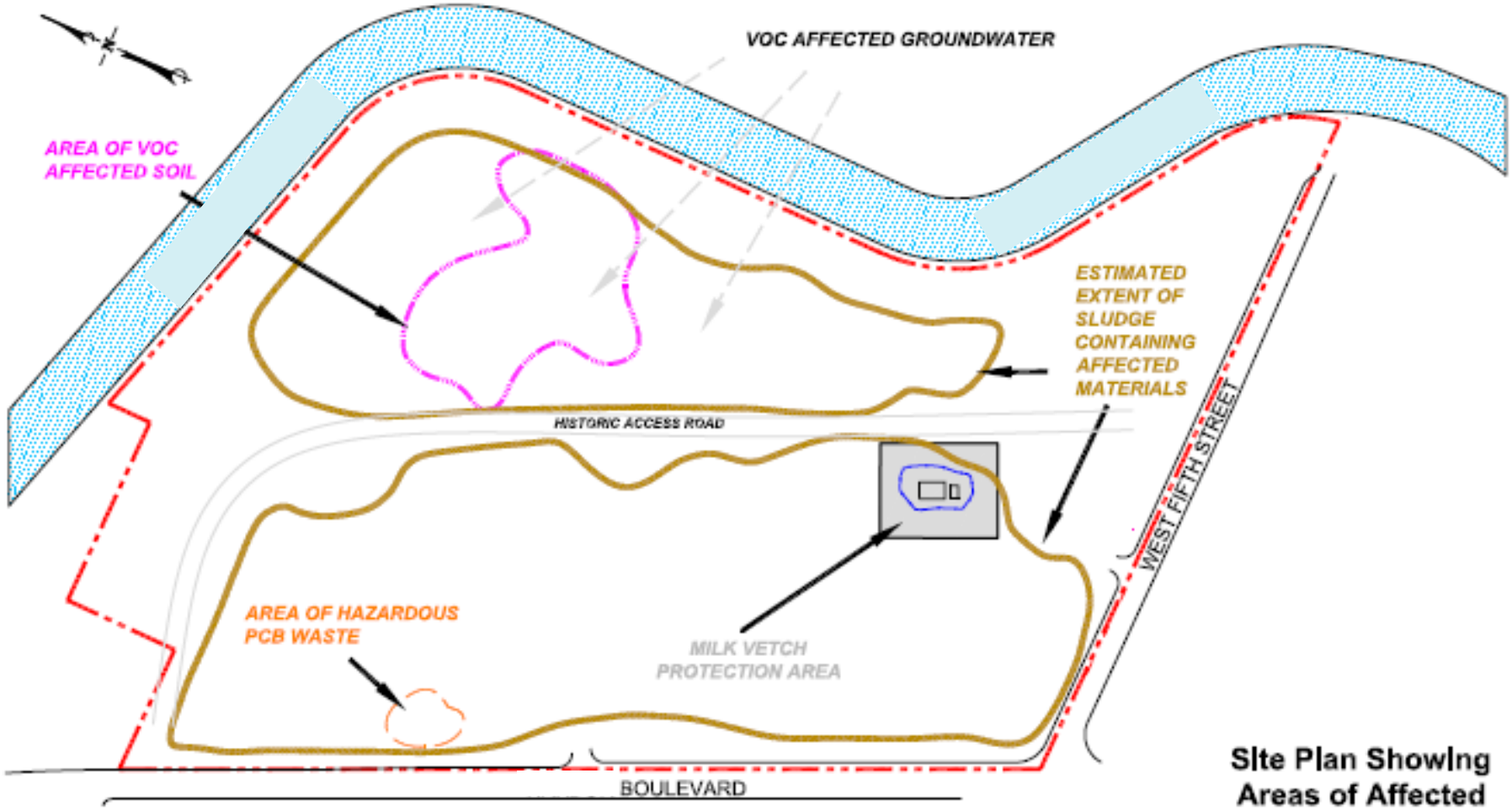
- **1950s, 60s, and 70s** – oil field waste disposal facility
- **1980s** – improper "closure" with non-TPH drilling muds
- **1990s-2004** – Site Characterization/RWQCB lead and 1996 RAP
- **1999** – Project EIR Certified with RWQCB RAP
- **2004** – Milk-Vetch litigation resolution
- **2004** – VCP, change to DTSC lead

Site Use for Oil Field Waste Disposal and Other Non-permitted Releases

Remedial Activities Completed

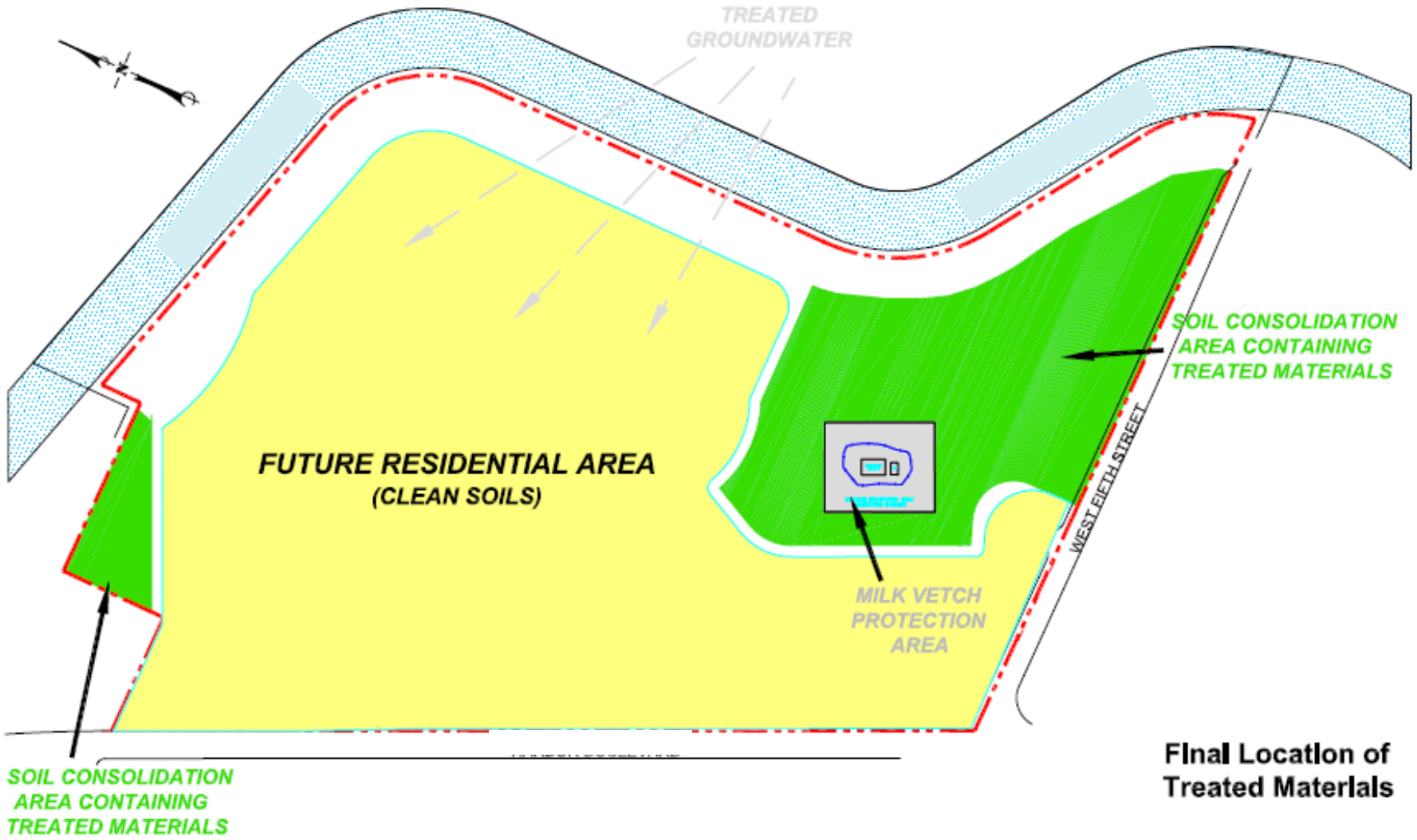
- **2005** – RAP in accordance with 1996 RWQCB Approved RAP
- **2006-2007** – RAP Implementation
  - Affected soil consolidation- 2M cu yds., 0.7M cu yds affected
  - Haz PBC waste to landfill - 10K cu yd.
  - Dewater pump and treat, DNAPL excavation
  - Substrate placement
  - DNAPL soil treatment
  - Monitored natural attenuation
  - Evolution of soil gas as a concern - during FS/RAP
  - Soil gas risk *unexpected* in post-remedial testing
- **2008** – Comfort Letter – included active vapor mitigation to address soil vapor and meet HHRA RAO

FS/RAP Implementation (pre-2007 cleanup)



Site Plan Showing Areas of Affected Materials

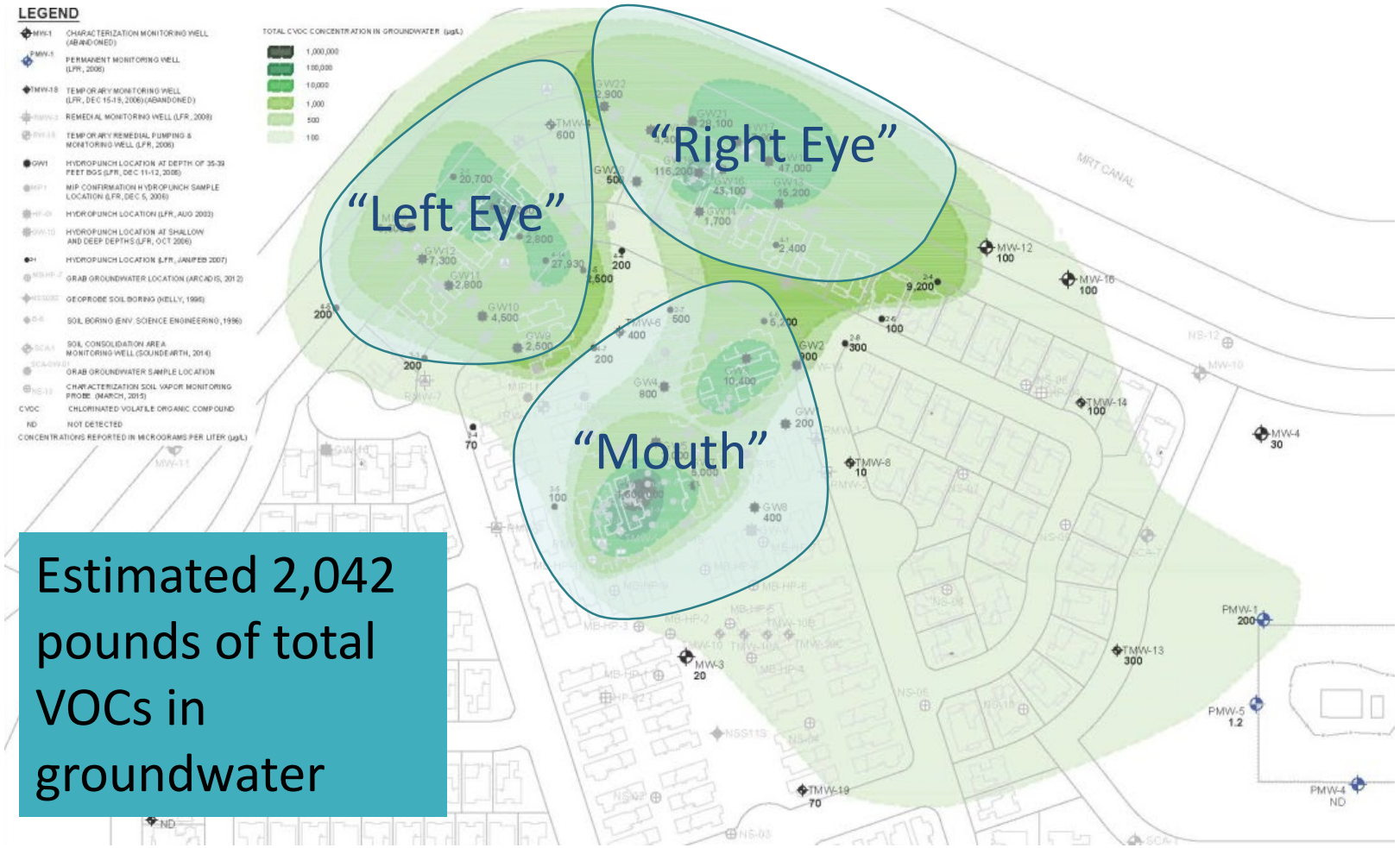
Post-2007 Soil Consolidation



Final Location of Treated Materials

2007 Membrane Placed between SCA and Residential Areas

2007 – DNAPL Discovery and Excavation



Estimated 2,042 pounds of total VOCs in groundwater

DNAPL Excavation

2008 – Post-Excavation

DNAPL Source Soils Placed in a Treatment Pile

2008 – Post-DNAPL Excavation, Pump & Treat, and Substrate Application

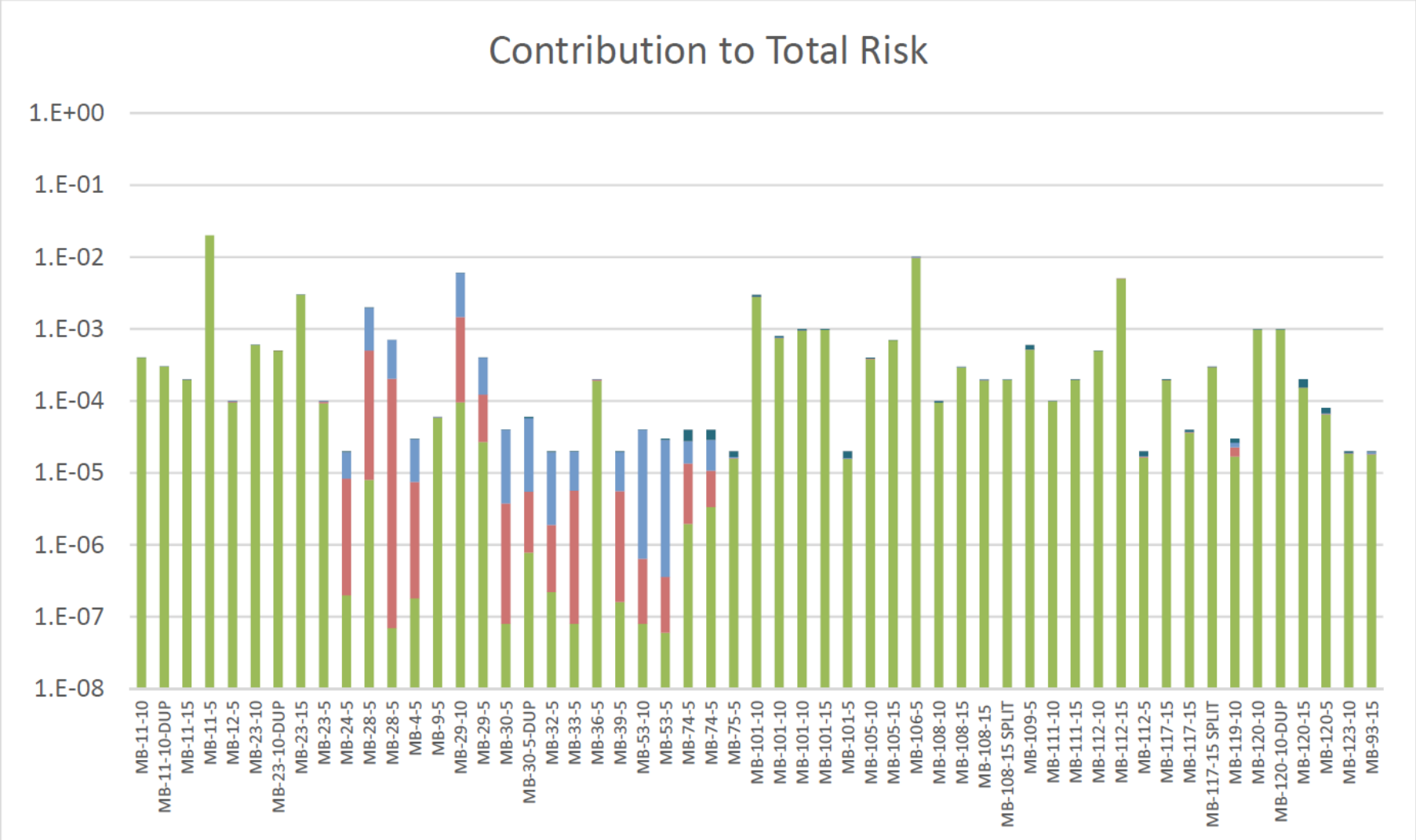
Estimated 142 pounds of total VOCs in groundwater

Site Conditions Update and Property Sale

- **2007** – Remediation “completed”
- **2008** – DTSC Comfort letter
- **2008** – Great Recession Foreclosure by Bank Lender
- **2008 – 2013** – Site Groundwater Monitoring- site maintenance
- **2012** – Site Conditions Update - due diligence process with Bank seeking buyer
- **2013** – Partial Remedial Action Completion Report defined remaining obligations
- **December 2013** – Developer purchased based on PRACR

2012 – Site Conditions Update - J&E Potential Risk

Soil Gas Risks Driven by VC at Depth



Developer completes the PRACR obligations and enters into CLRRA Agreement with DTSC

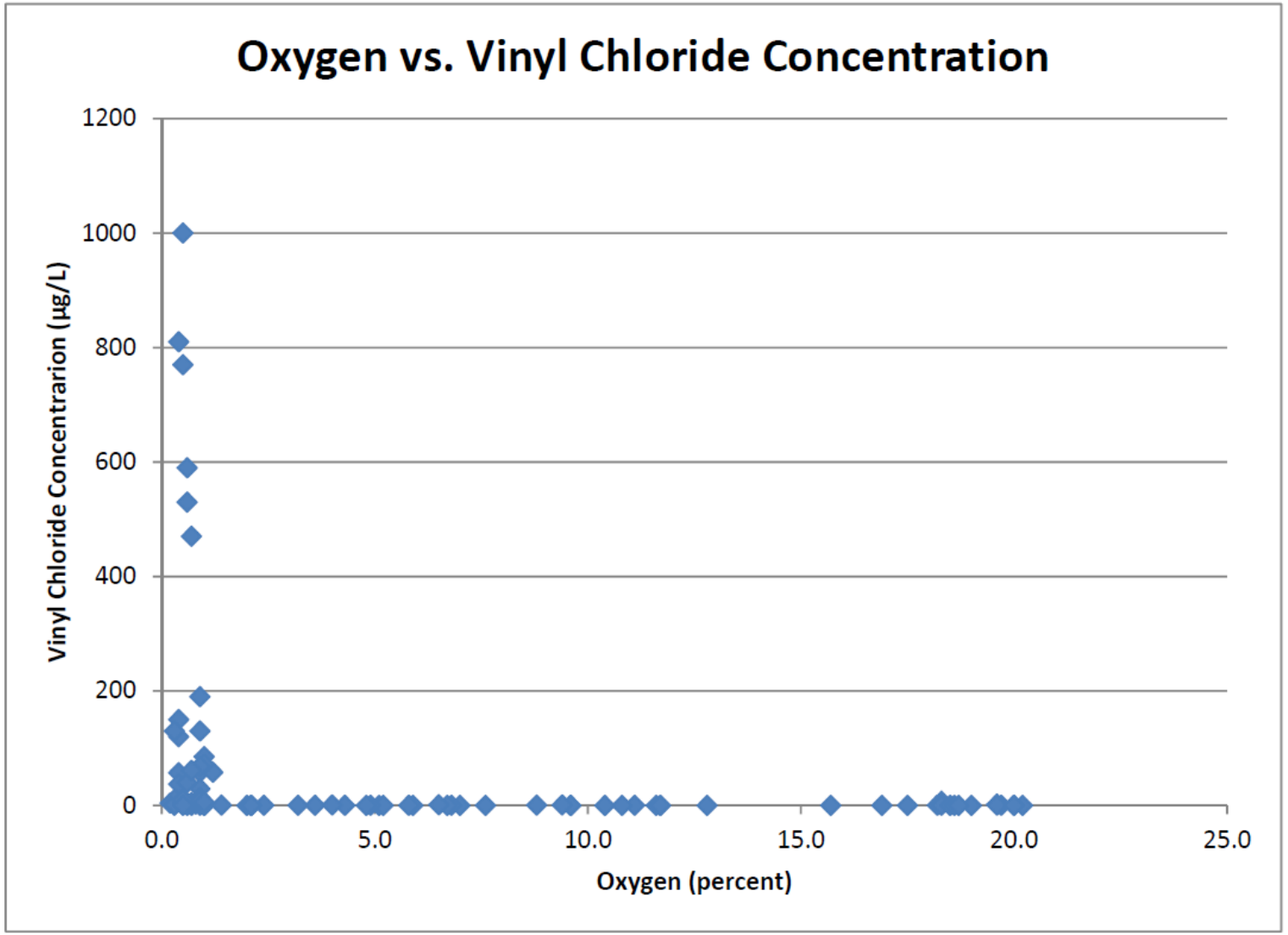
- **2014** – Developer initiates obligations outlined in PRACR
  - Source Soil Burrito Disposition to Cap and Landfill (2014-2015)
  - Soil Vapor Monitoring (2015 and 2019)
  - SVE Construction and Operation (2016-present)
  - Enhanced Attenuation Substrate Application (2016)
  - Groundwater Monitoring (2014-present)
  - O&M Plan
- **2016** – Work to finalize long term stewardship structure
- **2018** – California Land Reuse and Revitalization Act (CLRRA)
  - AAI
  - Response Plan
  - EIR Addendum
  - VIM Design
  - Public Meeting
  - FA and Cost Report

Source Soil Disposition to Cap and Landfill (2015)

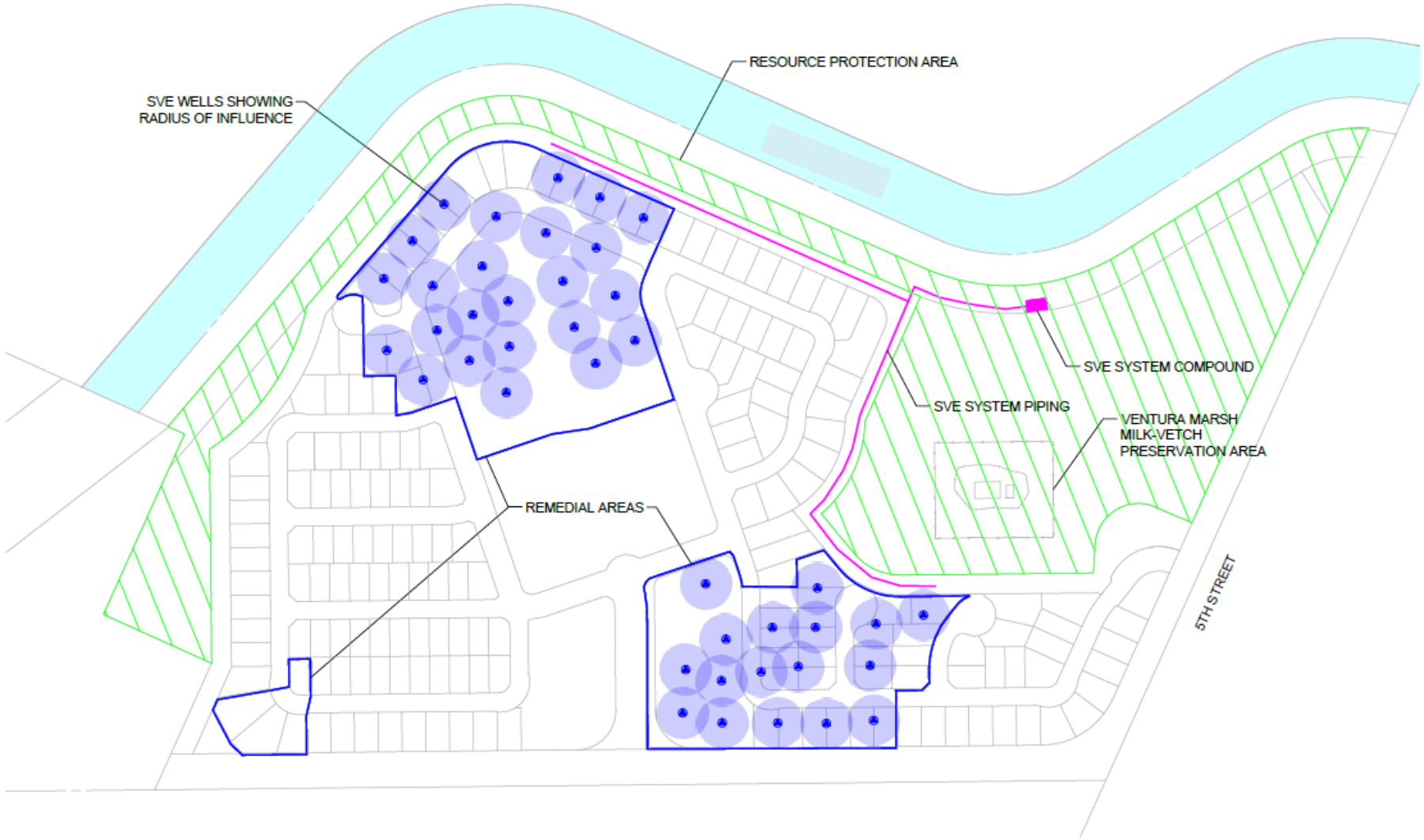
12,000 cy – cap material

7,000 cy – off-site landfill

Updated Soil-Vapor Monitoring (2015) J&E Risk – Does Not Represent VC Oxygen Biological Destruction

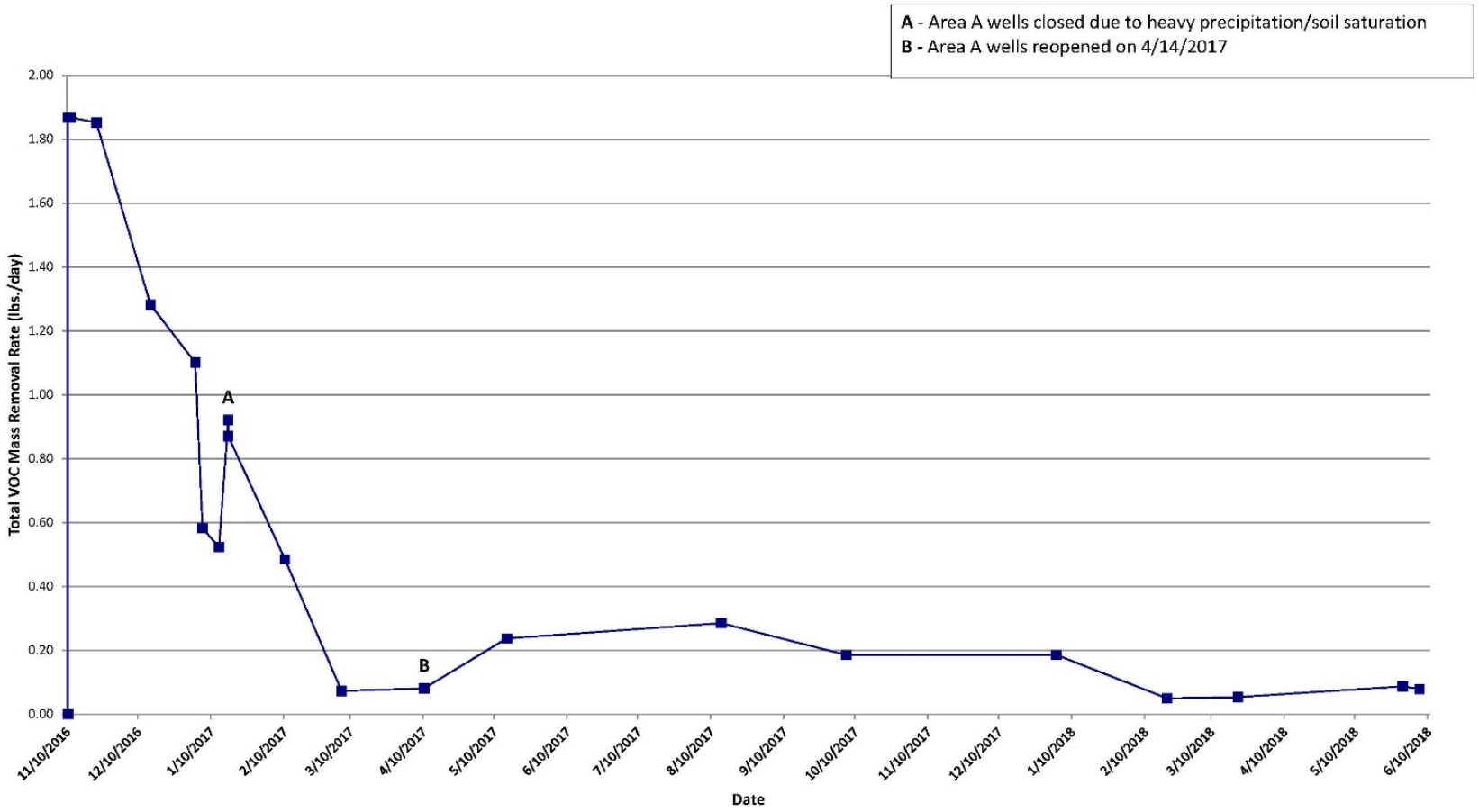


Constructed a 41-Well SVE System



SVE System Construction (2016)

In 18 Months of Operation, Steady State, Diffusion Limited, Removal Attained



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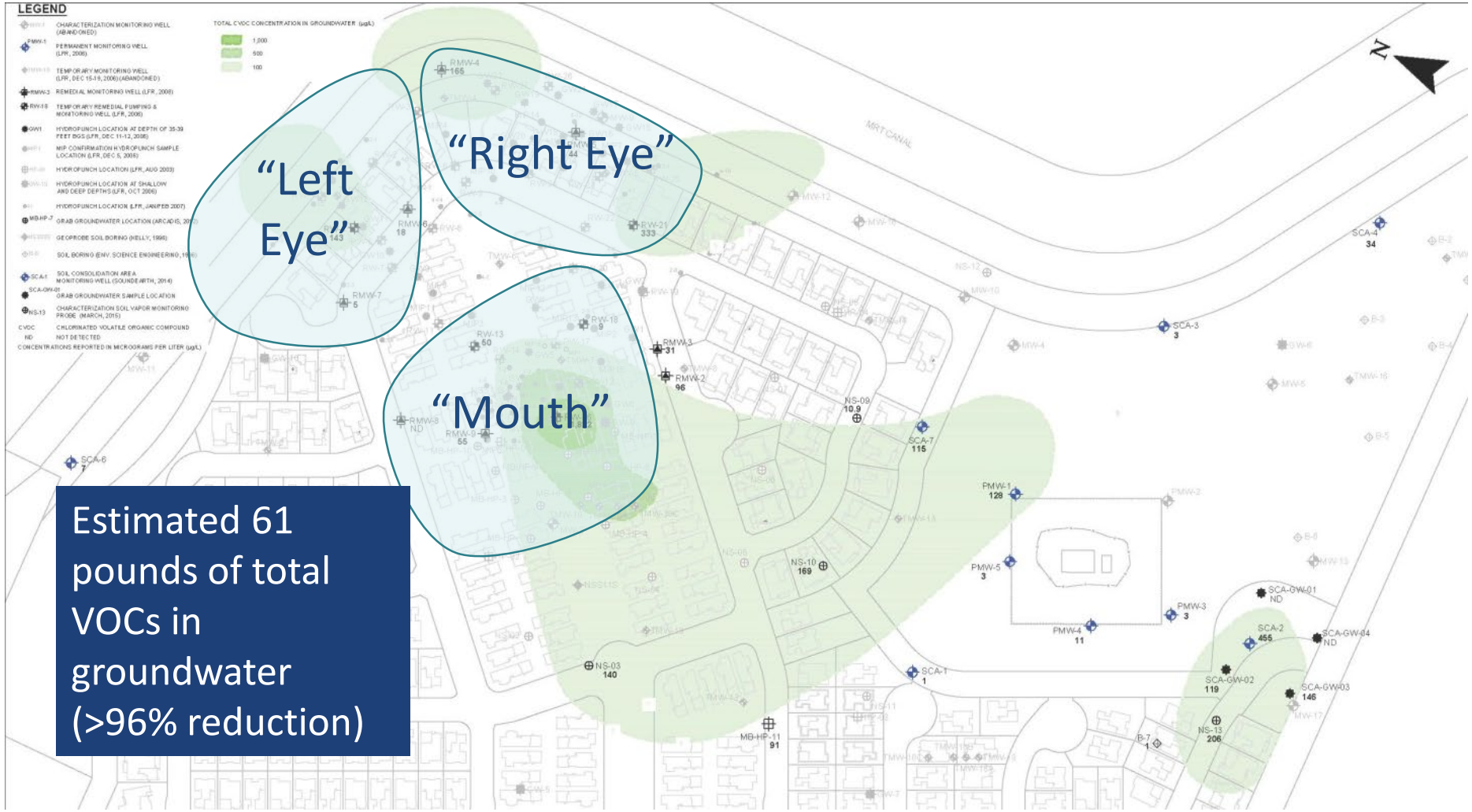
Estimated COC Mass Removal Rate versus Time for SVE System

S041-001

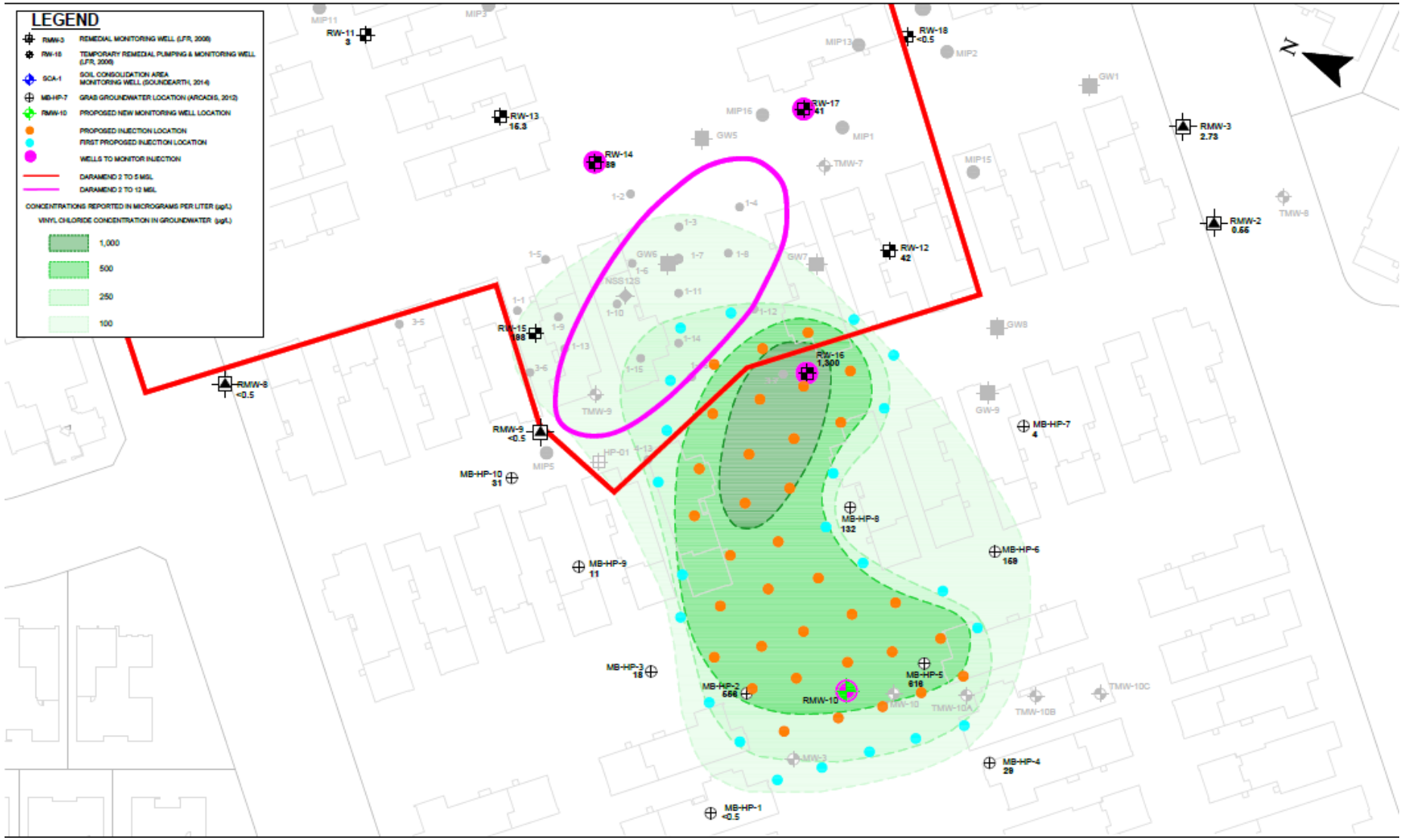
Figure 6

2015 – Groundwater Concentrations

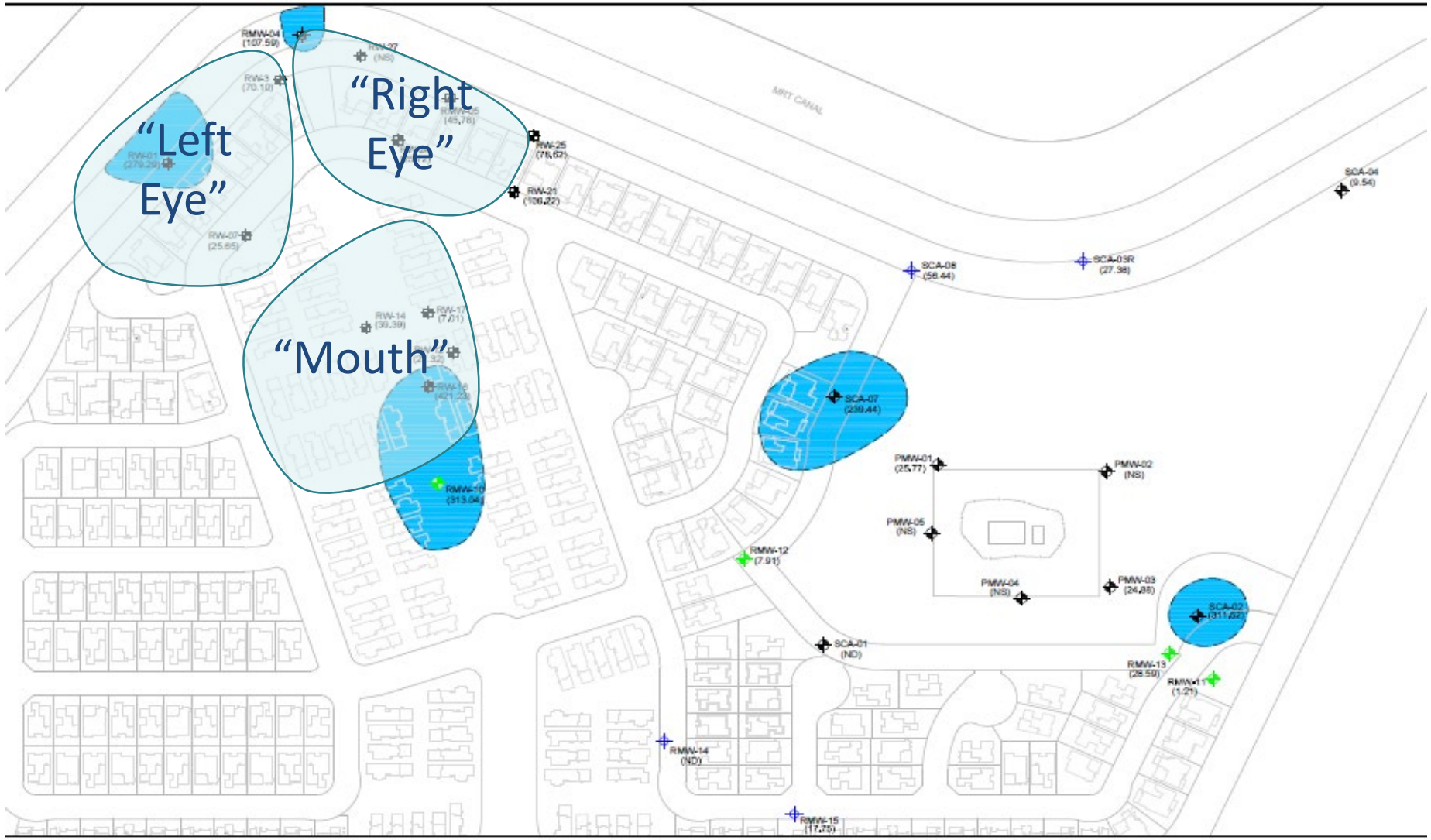


Estimated 61 pounds of total VOCs in groundwater (>96% reduction)

2016 - Enhanced Attenuation Substrate Application



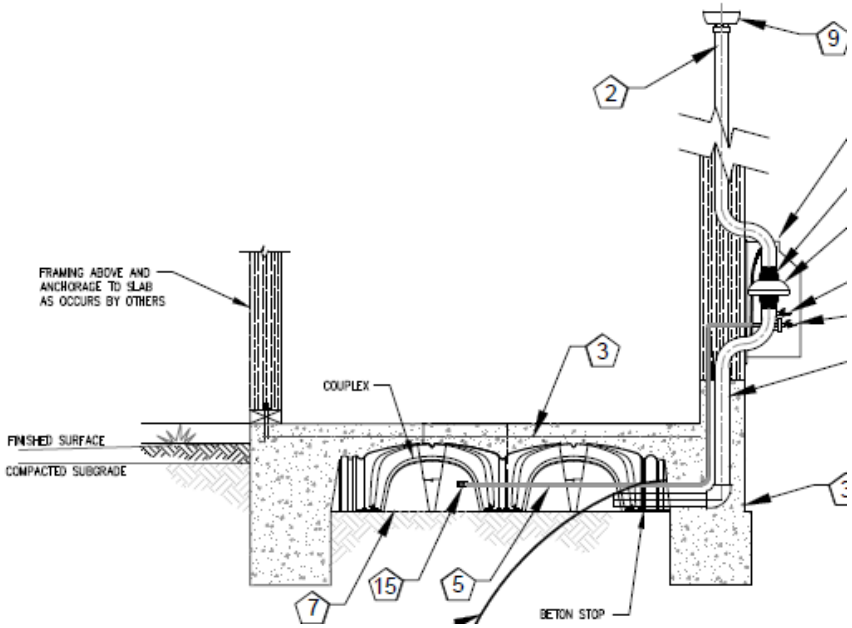
2018 – Groundwater Concentrations

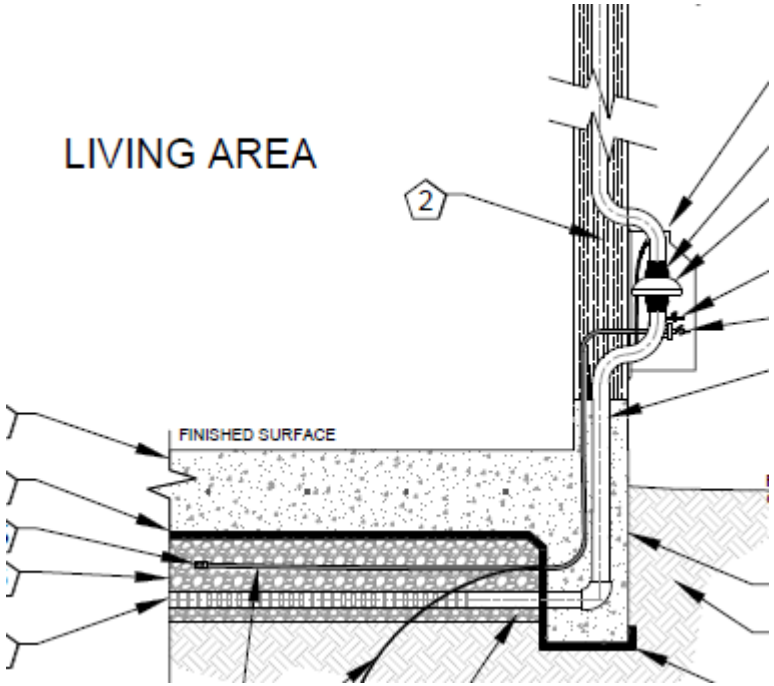


2018 California Land Reuse Revitalization Act Finalized

- Response Plan- Response Actions for CLRRA Indemnities
  - SVE – O&M
  - Active and Passive Soil-Vapor Mitigation for all Residences
    - Real-Time Operation Monitoring
  - SCA Monitoring and Maintenance
  - Groundwater Monitoring of MNA
  - Land-Use Covenants
  - Environmental Covenants, Conditions, and Restrictions (ECCRs)
  - Financial Assurance Structure
- Broad Developer Indemnities

Developer Options for Sub-Slab Depressurization Vapor Mitigation on All Homes





Radon Fan Alarm Linked to Remote Cell Notification System for Real-time Monitoring

Zoom

Checkpoint IIR Mitigation System Monitor with Remote Alarm

ALTA INDUSTRIAL WIRELESS VOLTAGE METERS - 0-10 VDC

INFORMATION

Price	:	Call for information
Format	:	ALTA Industrial
Frequency	:	900 MHz Change Frequency
Part#	:	MNS2-9-IN-VM-010
Voltage	:	0-10 VDC (selected)
Power	:	Standard (selected)
Antenna	:	Standard (Di-pole SMA) (selected)

Not Interested? RETURN TO THE STANDARD PRODUCT

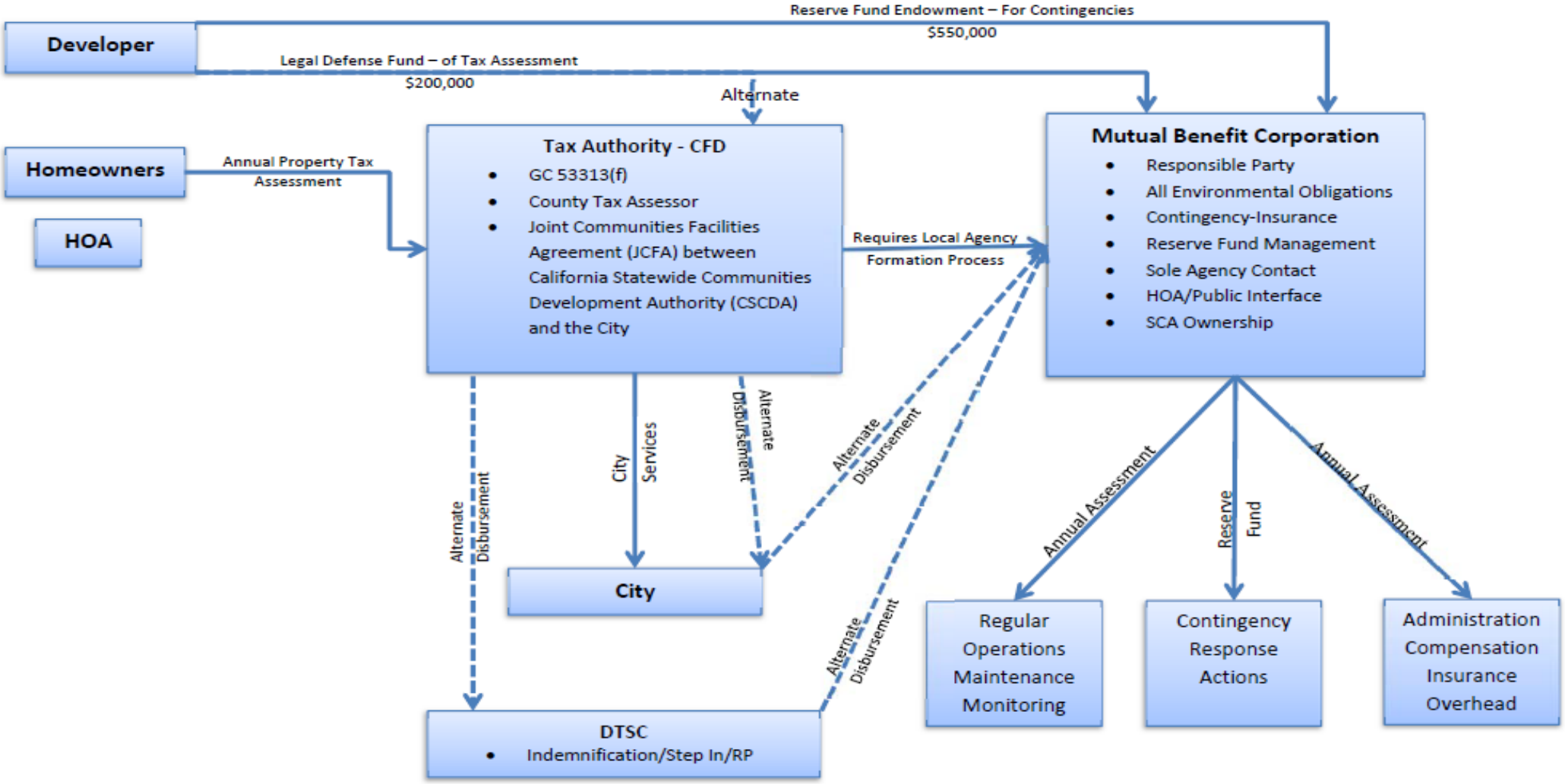
Ongoing Obligation Summary

- Site Groundwater Monitoring – Long-term
  - Unlikely Contingency Enhanced Attenuation
- SCA Monitoring
  - Groundwater Monitoring, Cap Efficacy – Access Controls
- Potential Indoor Air Risk
  - Sub-slab and Vadose Zone Monitoring
  - SVE operation – 2-5-year Operation
  - Long-Term Foundation SSD Administration
- Site Representation and Environmental Obligation Administration
- Contingencies

Environmental Stewardship Structure

- Long-Term Responsible Party
  - Mutual Benefit Corporation (MBC)
    - All Liability- the sole enforceable entity
    - All Environmental Obligations- responsible charge
    - Adaptive Management
    - Covenant Enforcement
    - Centralized Communications for all Environmental Issues
- Long-Term Adjustable Funding
  - Community Facilities District (CFD)- Mello-Roos
- Reserve Fund- managed by MBC
- Insurance
- Bonding of CFD Payments

Obligations Holding and Stewardship Structure in progress



Detailed Cost Projection of Obligations and O&M Administration Costs

														Initial Contingency Reserve Fund	$240,000
							NEC and DTSC 5-Year Review Costs		Decommissioning NEC and DTSC Costs (Table 3)			10%			
Year	Groundwater OMM Budget (Table 1)	Soil-Gas Monitoring (Table 2, Task 2)	VI OMM Budget (Table 4)	SCA OMM Budget (Table 5)	Annual Regulatory Oversight	NEC Budget (Table 6)	Annualized Accrual	5-Year Review	Annualized Accrual	Projected Expenditure	Total Annual Expenditure	Reserve Fund Contribution	CFD Funding	Contingency Funds Balance
1	$35,182	$69,192	$42,981	$41,079	$32,317	$162,281	$8,950		$33,942		$383,031	$38,303	$464,227	$321,195
2	$35,182	$69,192	$42,981	$41,079	$32,317	$162,281	$8,950		$33,942		$383,031	$38,303	$464,227	$402,391
3	$35,182	$69,192	$42,981	$41,079	$32,317	$162,281	$8,950		$33,942		$383,031	$38,303	$464,227	$483,586
4	$35,182	$69,192	$42,981	$41,079	$32,317	$162,281	$8,950		$33,942		$383,031	$38,303	$464,227	$564,782
5	$35,182	$69,192	$42,981	$41,079	$32,317	$162,281	$8,950	$ 44,750	$33,942		$427,781	$38,303	$464,227	$601,227
6	$30,173	$69,192	$42,981	$41,079	$22,656	$162,281	$8,950		$33,942		$368,361	$36,836	$448,089	$680,956
7	$30,173	$69,192	$42,981	$41,079	$22,656	$162,281	$8,950		$33,942		$368,361	$36,836	$448,089	$760,684
8	$30,173	$69,192	$42,981	$41,079	$22,656	$162,281	$8,950		$33,942		$368,361	$36,836	$448,089	$840,412
9	$30,173	$69,192	$42,981	$41,079	$22,656	$162,281	$8,950		$33,942		$368,361	$36,836	$448,089	$920,141
10	$30,173	$69,192	$42,981	$41,079	$22,656	$162,281	$8,950	$ 44,750	$33,942	$339,423	$752,534	$36,836	$448,089	$615,696
11	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$665,814
12	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$715,932
13	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$766,050
14	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$816,168
15	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148	$ 35,740	$6,604		$399,397	$36,366	$413,775	$830,546
16	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$880,664
17	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$930,782
18	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$980,899
19	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,031,017
20	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148	$ 35,740	$6,604		$399,397	$36,366	$413,775	$1,045,395
21	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,095,513
22	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,145,631
23	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,195,749
24	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,245,867
25	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148	$ 35,740	$6,604		$399,397	$36,366	$413,775	$1,260,245
26	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,310,363
27	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,360,481
28	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,410,598
29	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148		$6,604		$363,657	$36,366	$413,775	$1,460,716
30	$30,173	$69,192	$42,981	$41,079	$17,952	$162,281	$7,148	$ 35,740	$6,604	$132,084	$531,481	$36,366	$413,775	$1,343,010
Total 30-Year Obligation:					$633,890			$232,460			$11,734,069	$1,103,010	$12,837,079	

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Brownfield Productive Use

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Thank you!

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