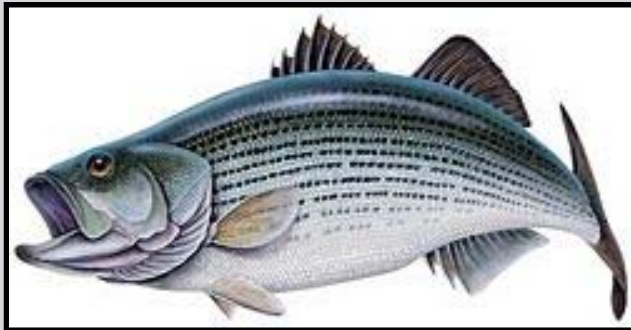


Integrated Monitoring Report (IMR)



Fabry/Konnan

February 20, 2014

Presentation Outline: 3 Parts of IMR

- **Part A:** Water Quality Monitoring
(MRP C.8)
- **Part B:** PCB & Mercury Loads Reduced via
Stormwater Control Measures
(MRP C.11/12)
- **Part C:** PCB & Mercury Load Reduction Opportunities
(MRP C.11/12)
- **All Three Parts Due to RWQCB on March 15.**

IMR Part A



IMR Part A – Water Quality Monitoring

- Develop and submit a comprehensive analysis of all water quality monitoring data collected pursuant to MRP Provision C.8.
- Submit a budget summary and recommendations for future monitoring for each requirement.
- Submitted as part of the Report of Waste Discharge for permit reissuance (by reference).

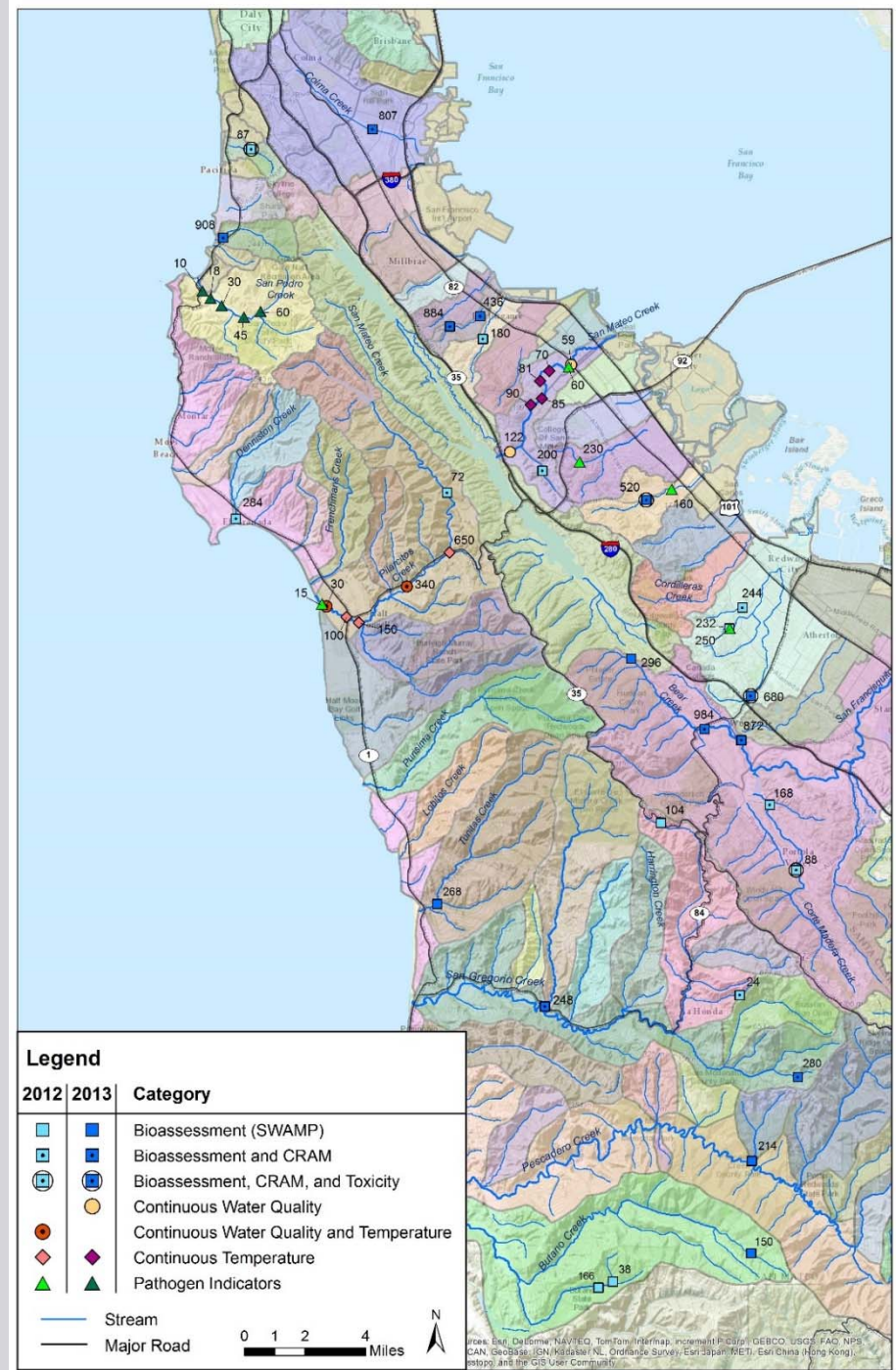


Creek Status Monitoring

- Management Questions
 - *Are conditions in local receiving water supportive of or likely supportive of beneficial uses?*
 - *Are water quality objectives being met?*



Creek Status Monitoring Sampling Stations (first 2 years)



Creek Status Monitoring Results

Category	Overall (n = 23)	Urban (n = 16)	Non-Urban (n = 7)
Very Good	22%	6%	57%
Good	22%	19%	29%
Fair	13%	13%	14%
Poor	9%	13%	0%
Very Poor	35%	50%	0%

Creek Status Monitoring Results

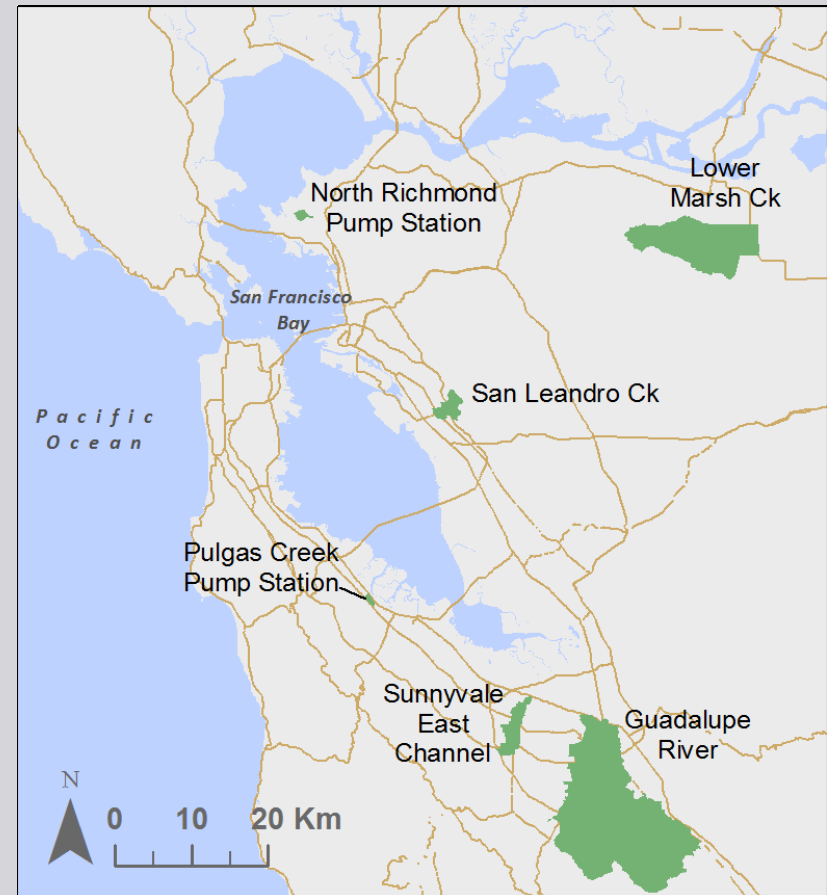
Trigger Exceedances during first two years
(follow-up **Monitoring Projects**: ID sources & controls):

Parameter	Creek
Bioassessment	43% overall and 63% urban.
Chlorine	One sample in each of 3 creeks: Calera Creek, Belmont Creek, Arroyo Ojo de Agua. 13% of sites overall.
Dissolved Oxygen	San Mateo Creek (De Anza Park)
Pathogen Indicators	Belmont Creek, San Mateo Creek , Arroyo Ojo de Agua, Pilarcitos Creek, San Pedro Creek

Triggers not exceeded for other parameters: nutrients, toxicity, metals, temperature, pH.

Pollutant of Concern Loads Monitoring

- Pollutant loads to Bay from local watersheds, long-term trends, TMDL allocations:
 1. Guadalupe River (SCVURPPP)
 2. Sunnyvale East Channel (RMP)
 3. Lower San Leandro (ACCWP)
 4. Lower Marsh Creek (CCCWP)
 5. **Pulgas Creek Pump Station (SMCWPPP)**
 6. North Richmond Pump Station (RMP)



WQ Monitoring – Important Issues

- Worth all the **\$\$\$\$** being spent? Informing BMPs, better management?
- Trends – are MRP BMPs helping over time (e.g., development requirements)?
- Impacts to local agencies – WQO exceedances, etc.
- Receiving water monitoring beats one alternative - outfall monitoring in other parts of the state.

Preliminary Costs and Benefits

Requirement		Relative Costs (\$ - \$\$\$\$)	Relative Benefit (✓ - ✓✓✓✓)
RMP	C.8.b	\$\$\$\$	✓✓✓
Creek Status	C.8.c	\$\$\$\$	✓✓✓
SSID Studies	C.8.d.i	\$\$\$	✓✓
BMP Effectiveness	C.8.d.i	\$\$	✓✓
Geomorphic Project	C.8.d.ii	\$\$	✓
POC Loads Monitoring	C.8.e.i	\$\$\$\$	✓✓
Long-Term Trends	C.8.e.ii	\$	✓✓✓
Citizen Monitoring	C.8.f	\$\$	✓
NPDES Fee Surcharge	NA	\$\$\$	✓

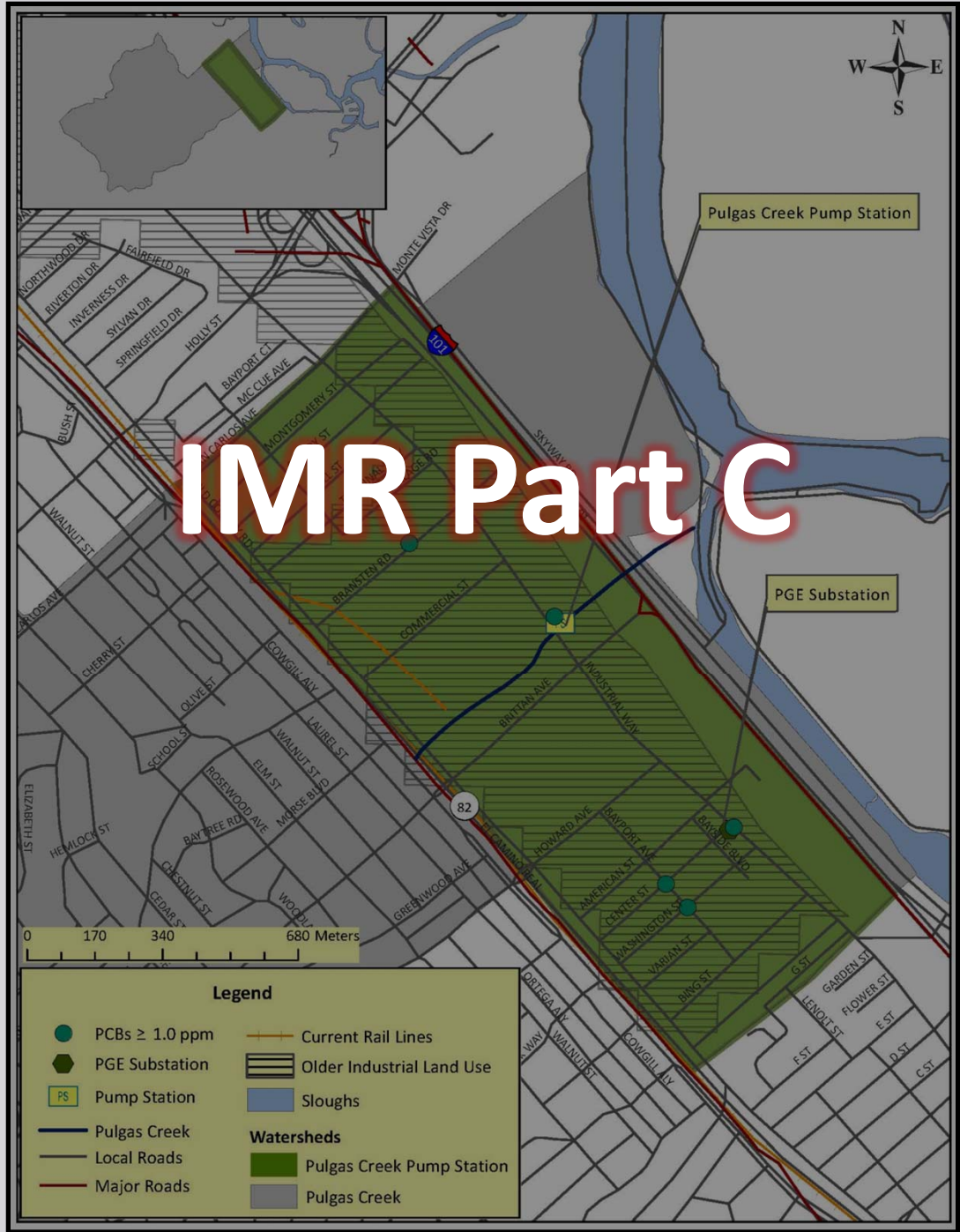


IMR Part B

IMR Part B - PCB & Hg Loads Reduced via Stormwater Controls

- Background on TMDLs
 - Driven by fish consumption advisories
 - Mandates 90% PCB load reduction
- PCB & mercury uses, sources and transport
- Evaluates effectiveness of PCB and mercury BMPs, including status of pilot projects via MRP 1.0

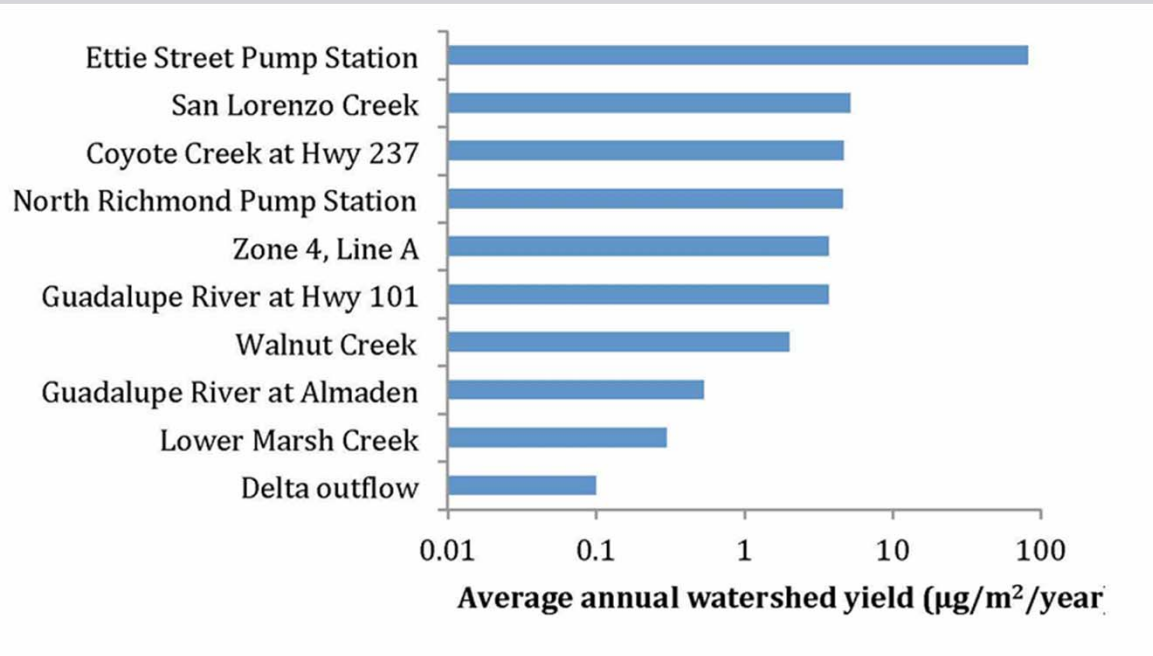
IMR Part C



IMR Part C – PCB & Mercury Load Reduction Opportunities

- Initial analysis of types of PCB/mercury sources and their locations.
- New land use based PCB/mercury yields.
- PCB/mercury load estimates for each SM County Permittee.
- Preliminary evaluation of cost-effectiveness of PCBs/mercury stormwater BMPs.
- Future implementation scenarios for PCB/mercury controls in SM County and preliminary estimates of costs and benefits.
- Data gaps, uncertainties, and future information needs.

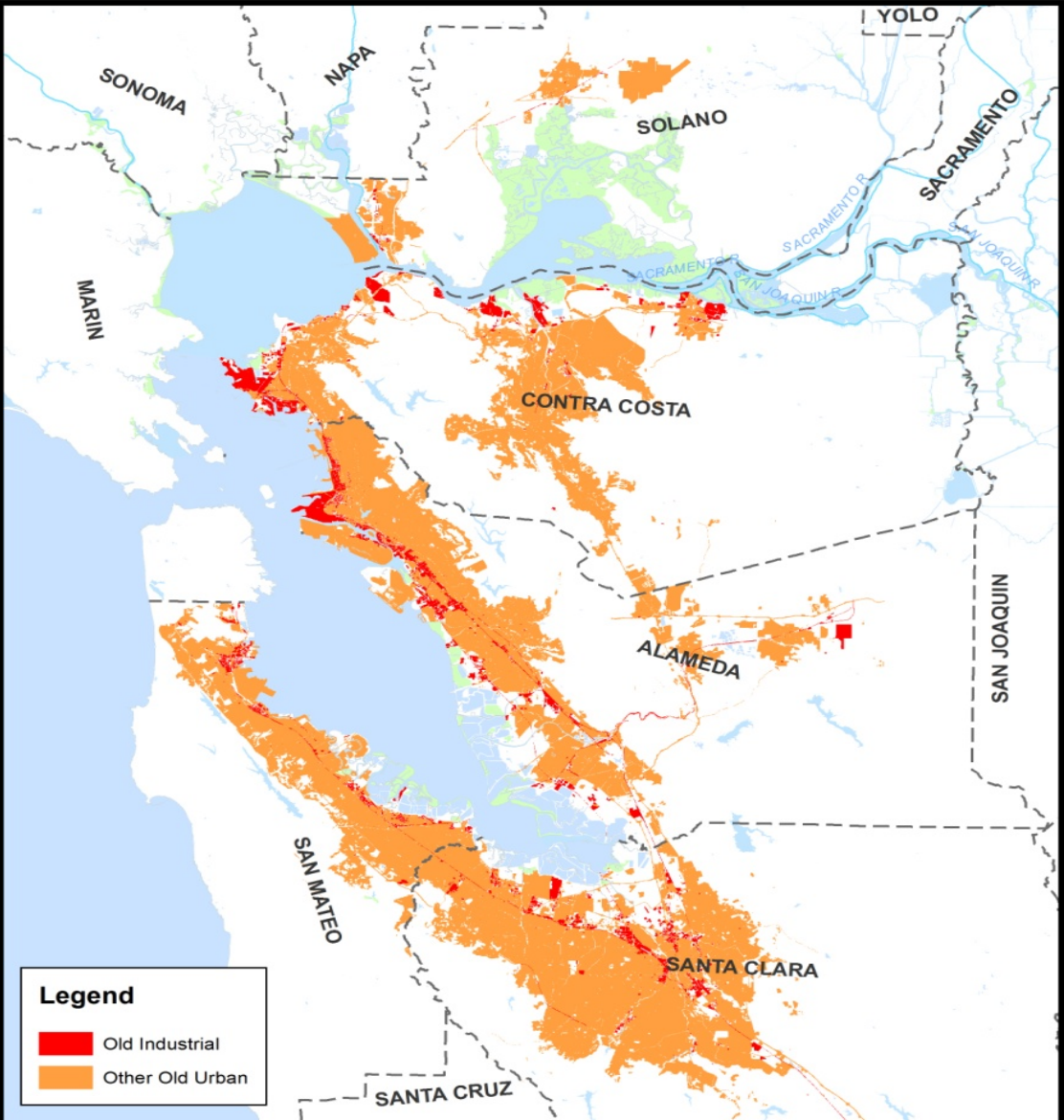
Land Use-based PCB Yields



Used regression analysis to convert watershed yields to land use yields.

Land Use Yield (mg/ac/yr)				
Old Industrial	Old Urban	New Urban	Open Space	Other
50	17.5	2	2.5	2

Old Industrial and Old Urban



Annual PCB Loading by Land Use Type for SM County Agencies

Municipality	Old Industrial	Old Urban	Open Space	New Urban and Other	Pulgas Creek P.S. Watershed Load	Total Loading
Atherton	0.4	54.3	0.3	0.0	0.0	55.0
Belmont	2.2	38.1	1.5	0.2	0.0	42.0
Brisbane	11.7	8.5	2.4	0.2	0.0	22.8
Burlingame	13.6	39.1	0.3	0.3	0.0	53.3
Colma	0.4	4.1	2.4	0.0	0.0	7.0
Daly City	1.4	35.2	0.8	0.0	0.0	37.4
East Palo Alto	4.4	20.5	0.3	0.0	0.0	25.3
Foster City	0.5	22.1	0.5	1.7	0.0	24.8
Hillsborough	0.2	58.5	1.5	0.0	0.0	60.2
Menlo Park	10.6	58.5	1.2	0.5	0.0	70.8
Millbrae	2.4	30.4	0.7	0.1	0.0	33.5
Pacifica	0.0	0.2	0.1	0.0	0.0	0.3
Portola Valley	0.1	13.1	1.3	0.4	0.0	14.9
Redwood City	15.0	80.1	2.0	2.6	0.1	99.9
San Bruno	2.4	46.3	1.6	0.0	0.0	50.3
San Carlos	8.6	42.8	1.0	0.3	84.5	137.2
San Mateo	9.1	114.8	1.4	0.7	0.0	126.0
Unincorporated SM County	13.3	74.5	25.9	4.5	0.0	118.3
South San Francisco	43.9	66.2	1.0	1.4	0.0	112.6
Woodside	0.3	52.7	5.4	0.5	0.0	58.9
Total	140.4	860.3	51.5	13.6	84.6	1150.4

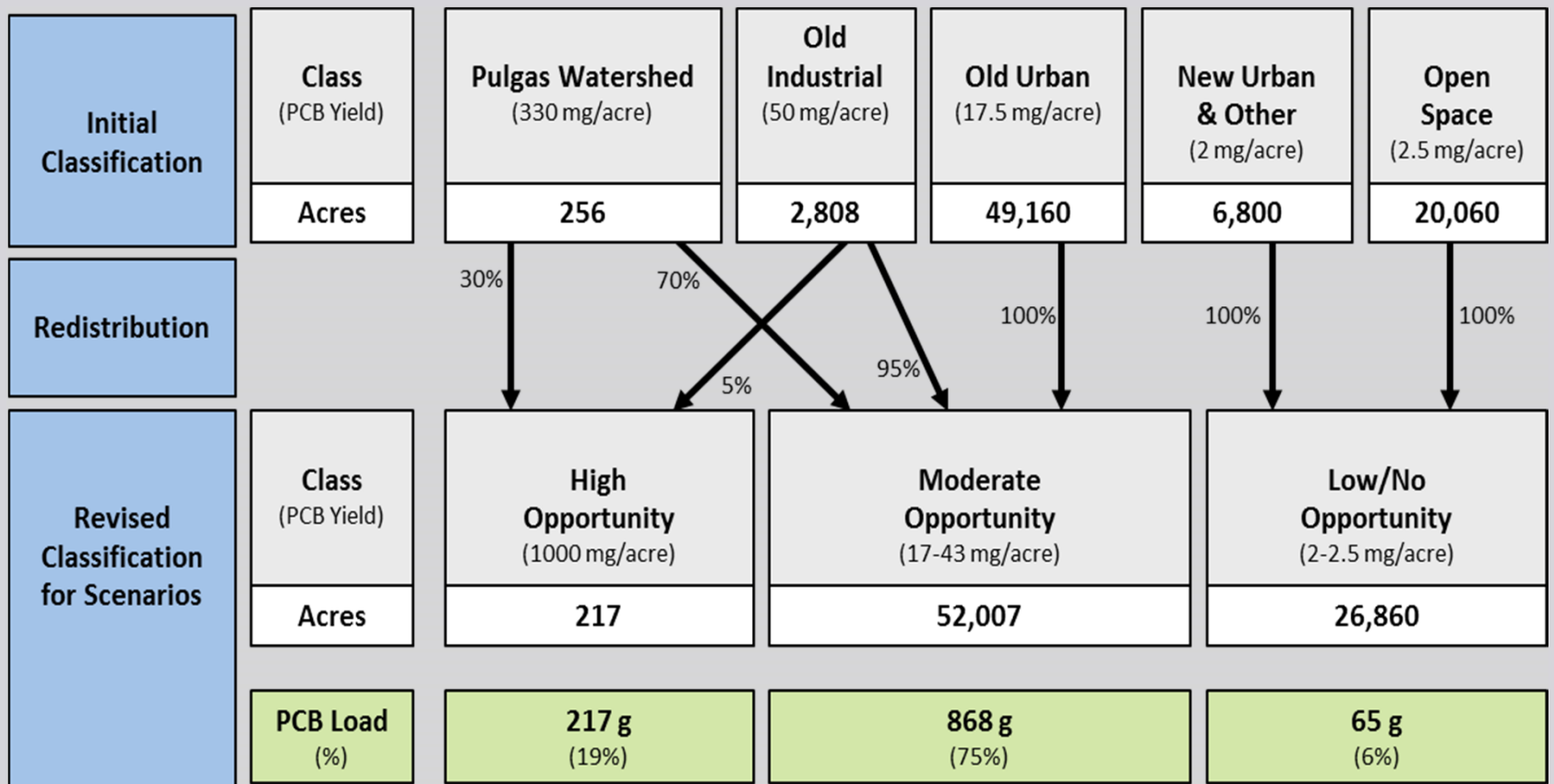
Summary of Planning Level Costs and Benefits of BMPs

Control Measure			Costs		Benefits	
			Cost Metric	Best Estimate	Benefit Metric	Best Estimate
Pollutant Mass Interception Control Measures	Enhanced Municipal Operation and Maintenance Practices ¹	Street Sweeping - Mechanical Broom	\$/curb-mile swept	\$48 (\$33 - \$50)	lbs street dirt reduced/ curb-mile swept	50 (10-160)
		Street Sweeping -Regenerative Air/Vacuum Assisted	\$/curb-mile swept	\$80 (\$29 - \$81)	lbs street dirt reduced/ curb-mile swept	200 (100-240)
		Pump Station Maintenance	\$/cleanout	\$25,000 (\$7,500 - \$35,000)	lbs sediment removed/ cleanout	16,000 (16,000-123,000)
		Storm Drain Line Cleaning/flushing	\$/linear mile of pipe flushed	\$211,000	lbs sediment removed/ linear mile of pipe flushed	5.1
		Street Flushing	\$/linear mile of street flushed	\$10,000 (\$10,000 - \$574,000)	lbs street dirt reduced/ linear mile of street flushed	600 (240-960)
	On-Site Stormwater Treatment via Retrofits ²	King and Hagan (2011) ³	\$/acre-year	\$10,869 (\$3,131 - \$19,830)	N/A	
		CW4CB Pilots ⁴	\$/acre-year	\$25,000 (\$8,900 - \$55,000)	% TSS mass reduced	73% (55-90%) ⁵
		Green Street pilot retrofits	\$/acre-year	\$13,000 (\$5,700 - \$22,000)	% TSS mass reduced	64% (60-67%)
		CW4CB Pilots: Hydrodynamic Separator Units	\$/acre	\$262 (\$64 - \$460)	mass TSS reduced/acre	Unknown ⁶
	Diversion to POTW ⁷	Constructed diversion with gravity feed to POTW	\$/year	\$85,000 (\$15,000 - \$210,000)	g POC/MG diverted/year	0.19 (0.004-0.76)
		Constructed diversion requiring pumped connection to POTW	\$/year	\$72,500 (\$35,000 - \$135,000)	g POC/MG diverted/year	0.19 (0.004-0.76)

Opportunity Categories

- **High Opportunity** – about 20% of PCB load
 - Old industrial land uses
 - PCBs/mercury stored, used, recycled, released
 - Higher concentrations and yields
 - Controls are most cost-effective
- **Moderate Opportunity** – about 75% of PCB load
 - Old urban and industrial land uses
 - Moderate concentrations and yields
 - Controls are less cost-effective
- **Low/No Opportunity** – about 5% of PCB load
 - Parks, open space, new or redeveloped urban land uses
 - Low concentrations and yields
 - Controls are not cost-effective

PCB Loading Scenarios



Scenario A

High Opportunity Areas

Control Measure	Percent of high opportunity area in which control measure is applied in each scenario.			
	A1	A2	A3	A4
Source Property ID and Abatement	10%	10%	10%	10%
Enhanced Street Sweeping	50%	-	-	45%
Street Flushing	-	50%	-	45%
Stormwater Treatment Retrofits	40%	40%	90%	-
Enhanced Pump Station Maintenance	-	-	-	1 extra cleanout per year

Four scenarios: implementation in **High Opportunity** areas in SM County over 20 years

Scenario B

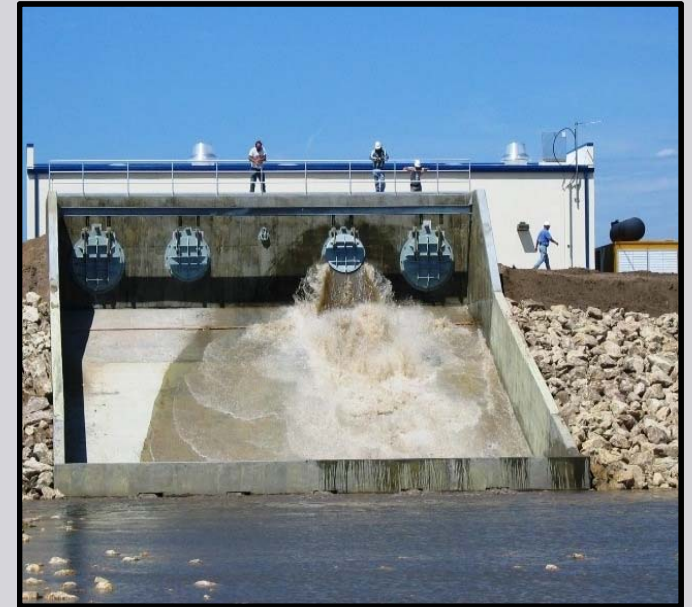
Moderate Opportunity Areas

- **Green Streets Retrofits**
 - Arterials retrofitted w/green streets over 50 years.
 - Includes highways such as El Camino Real. Freeways and local roads not included.
- **Redevelopment of Parcels**
 - Bioretention added to meet LID requirements as parcels are redeveloped over 50 years.
 - Applicable land uses: commercial, retail, schools, industrial & multi-family residences > 5,000 square feet.
 - Most of cost burden does not fall on local governments.

Scenario C

Stormwater Diversions to POTWs

- Three scenarios:
 - Dry weather diversion
 - Passive (gravity) low flow wet weather diversion
 - Large pumped wet weather diversion
- Varying pollutant concentrations in influent
- Varying flow rates and volumes diverted
- POTW costs not included



Summary of Scenarios

Opportunity Category	Scenario	Control Measures Applied within each Scenario	Load Reduction (grams)		Average Annual Costs
			PCBs	Hg	\$/year
High	A-1	<ul style="list-style-type: none"> 10% Source Property Abatement (PCBs Only) 50% Street Sweeping Enhancements 40% Stormwater Treatment Retrofits 	100	54	\$2.2 M
	A-2	<ul style="list-style-type: none"> 10% Source Property Abatement (PCBs Only) 50% Street Flushing 40% Stormwater Treatment Retrofits 	120	66	\$4.3 M
	A-3	<ul style="list-style-type: none"> 10% Source Property Abatement (PCBs Only) 90% Stormwater Treatment Retrofits 	160	97	\$4.9 M
	A-4	<ul style="list-style-type: none"> 10% Source Property Abatement (PCBs Only) 45% Street Sweeping Enhancements 45% Street Flushing 1 Additional Pump Station Cleanout per year 	66	32	\$2 M
Mod	B	Green Street Retrofits of Arterials to treat 28 acres/year.	0.30	3.7	\$360,000
	B	Parcel re-development with bioretention treating 310 acres/year	3.8	47	\$7.8 M
All	C-1	Passive (Gravity) Low Flow Dry Weather Diversion of 86 MG/year	0.95	2.3	\$50,000
	C-2	Passive (Gravity) Low Flow Wet Weather Diversion of 20 MG/year.	3.8	6.9	\$35,000
	C-3	Large Pumped Wet Weather Diversion of 200 MG/year.	38	69	\$210,000

Next Steps

- **IMR Parts A and C:** draft to TAC, SC and WAM by Mon Feb 24. Comments due Fri Mar 7. Due Mar 17.
- **Programs work with Permittees** – new information gathering process with similarities to trash. Will require SMCWPPP and municipal staff resources.
- **3 tracks over 18-months (Jan 2014 – Jun 2015):**
 1. Existing high opportunity area in pilot watershed.
 2. Identify new high opportunity areas.
 3. Moderate opportunity areas.
- **The more information available to inform MRP 2.0, the better crafted new requirements.**



Questions?