Tentative Resolution No. R9-2017-0015

A Resolution Amending the Water Quality Control Plan for the San Diego Basin to Incorporate Site-Specific Water Effect Ratios into Water Quality Objectives for Toxic Pollutants and Total Maximum Daily Loads for Copper and Zinc in Chollas Creek

February 8, 2017

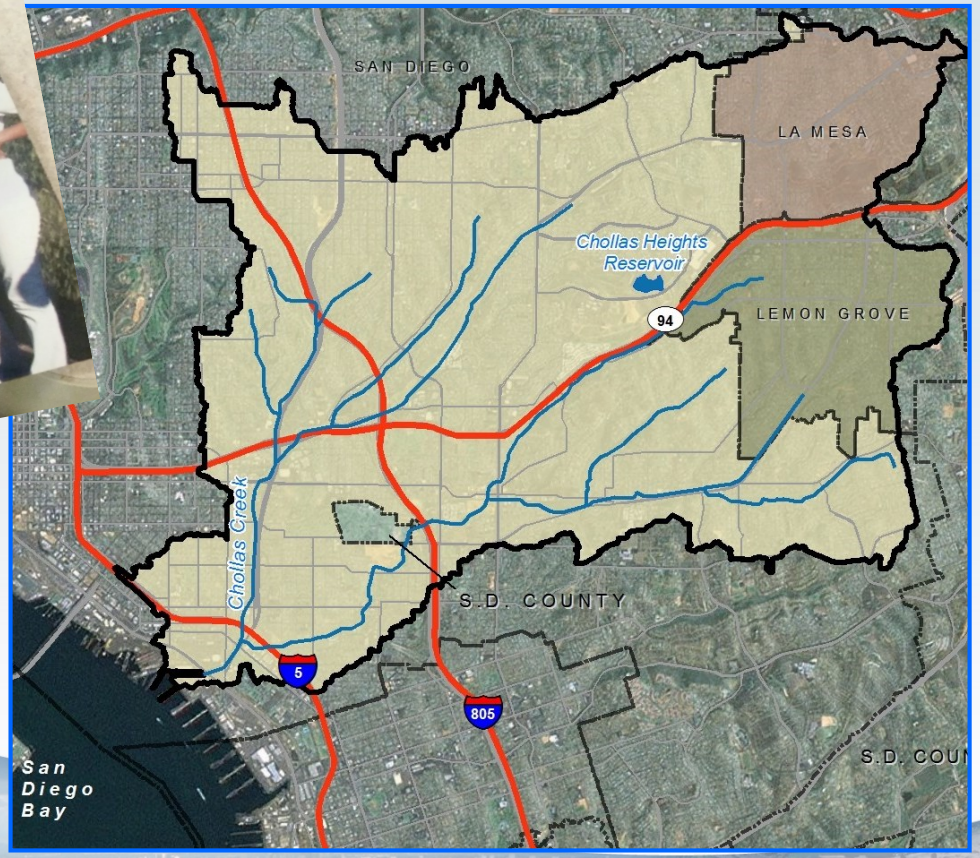
CALIFORNIA
Water Boards

Tentative Resolution No. R9-2017-0015

- Recap
- Issues raised at December 14, 2016 Board meeting

Update to TMDLs Adopted in 2007

- **Where?** Chollas Creek



Update to TMDLs Adopted in 2007

- **Where?** Chollas Creek
- **What?** copper and zinc

Basin Plan

TOXIC POLLUTANTS

The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California on May 18, 2000 (The California Toxics Rule or "CTR;" [40 CFR 131.38]). CTR criteria constitute applicable water quality criteria in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality criteria in California as well.

CTR

Environmental Protection Agency

40 CFR Part 131

Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule

USEPA Guidance

The WER must be determined as set forth in Interim Guidance on USEPA's Determination and Use of Water Effect Ratios or alternatively, other scientifically defensible methods adopted by the State as part of its water quality standards program and approved by USEPA.

Update to TMDLs Adopted in 2007

- **Where?** Chollas Creek
- **What?** copper and zinc
- **Why?** prevent toxicity (protect BUs of WILD and WARM)

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Pueblo San Diego Watershed																
unnamed intermittent coastal streams	8.10	+							○	●		●		●		
Powerhouse Canyon	8.21	+							○	●		●		●		
Chollas Creek [3,4]	8.22	+							○	●		●		●		

Update to TMDLs Adopted in 2007

- **Where?** Chollas Creek
- **What?** copper and zinc
- **Why?** prevent toxicity (protect BUs of WILD and WARM)
- **How?** replace "placeholder" WER with site-specific WER

w. This criterion has been recalculated pursuant to the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA–820–B–96–001, September 1996. See also Great Lakes Water Quality Initiative Criteria Documents for the Protection of Aquatic Life in Ambient Water, Office of Water, EPA–80–B–95–004, March 1995.

x. The State of California has adopted and EPA has approved site specific criteria for the Sacramento River (and tributaries)

(2) Factors for Calculating Metals Criteria. Final CMC and CCC values should be rounded to two significant figures.

(i) $CMC = WER \times (Acute\ Conversion\ Factor) \times (\exp\{m_A[\ln(hardness)]+b_A\})$

(ii) $CCC = WER \times (Chronic\ Conversion\ Factor) \times (\exp\{m_C[\ln(hardness)]+b_C\})$

(iii) Table 1 to paragraph (b)(2) of this section:

Metal	m_A	b_A	m_C	b_C
Cadmium	1.128	−3.6867	0.7852	−2.715
Copper	0.9422	−1.700	0.8545	−1.702
Chromium (III)	0.8190	3.688	0.8190	1.561
Lead	1.273	−1.460	1.273	−4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	−6.52		
Zinc	0.8473	0.884	0.8473	0.884

Note to Table 1: The term "exp" represents the base e exponential function.

What is the maximum amount of metals that can be present in Chollas Creek without creating toxic effects in toxicity test organisms?

December 14, 2016 Board Meeting

Issues raised:

1. Industrial site contributions;

2. Sampling methods for determining water quality criteria versus determining compliance; and

3. Selective application of water quality objectives.

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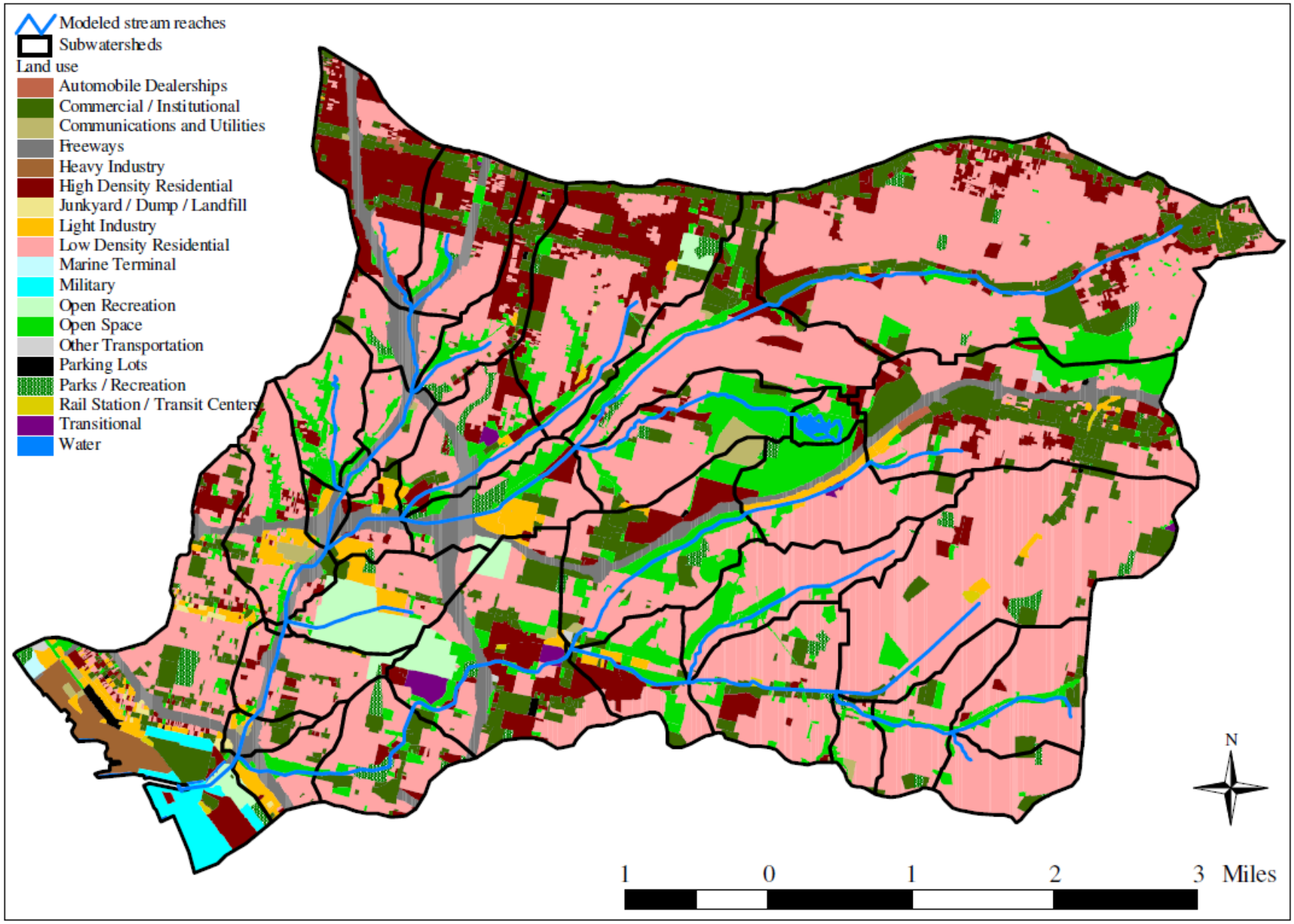
Industrial Site Contributions



Although individual industrial facilities could potentially discharge high concentrations of copper or zinc during storm events, based on land use modeling, **industrial facilities represent less than six percent of the total expected loading** in the watershed.

December 14, 2016 Board Meeting

Issues raised:

1. Industrial site contributions;

2. Sampling methods for determining water quality criteria versus determining compliance; and

3. Selective application of water quality objectives.

Monitoring and Assessment

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Water quality sampling procedures vary based on the purpose of the sampling. Flow-weighted composite methods are well suited for establishing water quality objectives and for monitoring at mass-loading stations, while **grab samples are well suited for assessing performance of best management practices** in storm water runoff from industrial sites.

December 14, 2016 Board Meeting

Issues raised:

1. Industrial site contributions;
2. Sampling methods for determining water quality criteria versus determining compliance; and
3. Selective application of water quality objectives.

WQOs in the Basin Plan, like the beneficial uses they protect, **apply to the receiving waters** themselves.

WQOs are the maximum amounts of copper and zinc that can be present in Chollas Creek without creating acute or chronic toxic effects in aquatic organisms.

Waste discharge requirements are crafted to ensure that WQOs will be met in the receiving waters.

Waste discharge requirements are currently in effect for:

- Municipal Storm Water Dischargers
- Caltrans
- U.S. Navy
- Industrial Storm Water Dischargers
- Construction Storm Water Dischargers
- City of San Diego - South Chollas Landfill (Groundwater)
- Groundwater Extraction Dischargers

Waste discharge requirements are the **appropriate regulatory tool** for addressing discharge-type conditions. In the case of industrial storm water, this is through the Industrial General Permit, which went into effect in July 2015.

Next Steps

How the criteria that apply to the creek are met (by controlling discharges in the watershed) is the next step.

That is carried out through waste discharge requirements.

Copper Water Effect Ratios (North Fork)

Table 6-2. Hardness Normalized Dissolved Copper WERs and 48-Hour *C. dubia* LC50 for Laboratory Water (DMW) and Chollas Creek Site SD8(1)

WER event	DMW LC50 (µg/L)	SMAV[1] (µg/L)	SD8(1) LC50 (µg/L)	WER Calculated Using DMW	WER Calculated Using SMAV
No. 1 (02/27/2010)	3.542	22.11	174.3	49.20	7.882
No. 2 (04/01/2010)	7.934	22.11	375.4	47.32	16.98
No. 3 (10/30/2010)	4.969	22.11	190.4	38.31	8.610
No. 4 (12/20/2010)	3.913	22.11	144.0	36.80	6.512
Geometric mean (± standard deviation)				40.39 (±6.26 SD)	9.307 (±4.74 SD)

For example, for the December 20 event:

SD8(1) LC50 divided by SMAV = 144.0/22.11 = 6.512

Copper Water Effect Ratios (South Fork)

Table 6-3. Hardness Normalized Dissolved Copper WERs and 48-Hour *C. dubia* LC50 for Laboratory Water (DMW) and Chollas Creek Site DPR2

WER event	DMW LC50 (µg/L)	SMAV[1] (µg/L)	DPR2 LC50 (µg/L)	WER Calculated Using DMW	WER Calculated Using SMAV
No. 1 (02/27/2010)	3.542	22.11	109.5	30.90	4.951
No. 2 (04/01/2010)	7.934	22.11	227.7	28.70	10.30
No. 3 (10/30/2010)	4.969	22.11	145.8	29.35	6.596
No. 4 (12/20/2010)	3.913	22.11	157.6	40.29	7.130
Geometric Mean (± standard deviation)				32.00 (±5.40 SD)	6.998 (±2.24 SD)

For example, for the December 20 event:

SD8(1) LC50 divided by SMAV = 157.6/22.11 = 7.130

Zinc Water Effect Ratios

Table 6-4. Hardness Normalized Dissolved Zinc WERs and 48-Hour *C. dubia* LC50s for Laboratory Water (DMW) and Chollas Creek Sites (SD8(1) and DPR2)

WER event	DMW LC50 (µg/L)	SD8(1) LC50 (µg/L)	SD8(1) WER	DPR2 LC50 (µg/L)	DPR2 WER
No. 1 (02/27/2010)	204.5	363.9	1.780	339.0	1.658
No. 2 (04/01/2010)	224.0	712.9	3.182	493.9	2.205
No. 3 (10/30/2010)	281.5	608.8	2.163	333.0	1.183
No. 4 (12/20/2010)	171.2	341.5	1.995	339.1	1.980
Geometric Mean (± standard deviation)			2.223 (±0.62 SD)	-	1.711 (±0.44 SD)

For example, for the December 20 event:

SD8(1) LC50 divided by DMW LC50 = 341.5/171.2 = 1.995

DPR2 LC50 divided by DMW LC50 = 339.1/171.2 = 1.980

Revisions

- An addition to Finding No. 7 to clarify that the amendment is not self-implementing; and

- A new Finding No. 13 to include the errata discussed by the Board at the December hearing regarding future revisions to the water quality objectives.

Recommendation

Adopt Resolution No. R9-2017-0015 with Errata

- Process for developing the water effect ratios in accordance with USEPA-promulgated standards;
- Scientific rationale verified by staff and external scientific peer review;
- Consistent with the Practical Vision; and
- One of our top three 2014 Triennial Review priorities.