

**Los Angeles Region Contaminated Sediments Task Force  
Sediment Thresholds Subcommittee  
January 28, 2003 Meeting Minutes.**

Attendees: Dan McCoy, (MEC); Barry Synder (AMEC), Nick Buhbe (AMEC), Steve Cappellino (Anchor), Michael Lyons, (LA RWQCB), Ying Poon (Everest), Kathryn Curtis (POLA), Tom Johnson (POLB), Kathy Anderson (Corps), Steve Bay (SCCWRP), Paul Johansen (POLA), Steven John (EPA)

CSTF Sediment Quality Guidelines Development Project: Phase 2

Phase 2: Tasks:

- Summarize SQG approaches (accomplished).
- Select subset of SQGs for analysis (accomplished).
- Apply SQGs to CSTF data (all southern California data).
- Compare performance in predicting toxicity.
- Select candidate(s) for further consideration.

Selected SQGs:

- ERMq; EqP organics; AET; Consensus; SQG Q-1.

Data Screening:

- Toxicity data for 4 marine amphipod species;
- Studies with control survival >85%;
- Studies with water ammonia below test thresholds;
- Studies with complete chemistry data;
- Excludes records exceeding minimum SQG-specific detection limits.

Screening Changes:

- New Dataset to calculate all the guidelines;
- Screening thresholds were changed:
  - \* data with high values, coded as below detection limits, were excluded
  - \* data with only a few analytes per sample were excluded.

Detection Limits:

- Criteria: lowest value (of the 5 chosen SQGs) selected for each particular chemical;
- \* <0.2 this lowest value used for screening.
- Analytes that did not meet the criteria were eliminated from the dataset.

Chemistry Completeness:

- Standardized for the 5 SQG approaches;
- Only samples with a minimum of 6 PAHs and metals were used in the analysis;
- Surface and subsurface data were used.

New Consensus Values:

- 11 New Midrange Effects Concentration (MEC) values were created for the Consensus SQG Analysis:

1. Selected Chemicals with at least 3 values were available using existing SQGs;
2. ERM, Lowest AET (LAET) and PEL were used to calculate each new consensus value;
3. The geometric mean was calculated to produce the value.

Chemical	Consensus MEC	Units
Arsenic	55.0	ppm dry wt
Cadmium	5.9	ppm dry wt
Chromium	248.8	ppm dry wt
Copper	224.9	ppm dry wt
Lead	222.3	ppm dry wt
Mercury	0.6	ppm dry wt
Nickel	67.6	ppm dry wt
Silver	3.4	ppm dry wt
Zinc	357.1	ppm dry wt
DDTs	25.4	ppb dry wt
Dieldrin	7.0	ppb dry wt
PAHs	18000.0	OC ppm
PCBs	0.47	ppm dry wt

Analysis Datasets:

Guideline	Studies	Records	% Toxic
ERMq	57	1205	31
AET	57	1202	31
SQG Q1	57	1205	31
EqP	50*	747	29
Consensus	57	1205	31

\* Not all studies have TOC data available

Analysis Datasets:

Guideline	# Studies Used Previously	Final # of Studies*
ERMq	55	57
AET	56	57
EqP	24	50

\* Datasets after incorporating TAC suggestions for data screening

Performance Analysis:

- Applied provisional Level I and Level II thresholds to the dataset;
- Tabulated number of toxic and nontoxic above and below threshold;
- Toxic defined as significantly different ( $\alpha = 0.05$ ) and <80% of control;
- Calculated efficiency, sensitivity, specificity incorporating statistical significance;
- Calculated area under Receiver Operator Characteristic (ROC) curve.

Results Classification:

Toxicity Results	Toxic	A False -	B True +
	Nontoxic	C True -	D False +
		No Hit	Hit
SQG Prediction			

Level I Performance Measures – % Nontoxicity Efficiency =  $(C/A + C) \times 100$   
 Specificity =  $(C/C = D) \times 100$

Level II Performance Measures – % Toxicity Efficiency =  $(B/B + D) \times 100$   
 % Sensitivity =  $(B/A + B) \times 100$

Receiver Operator Characteristics (ROC) Curve:

- Used consistent criteria to classify toxic samples;
- Sorted data based on guideline value;
- Calculated false positive and true positive rates and plotted data;
- Area under curve indicates discriminatory power of SQG;
- Not calculated for AET (no numeric range).

DDT and PCBs off Palos Verde Peninsula

- DDTs in wide range from 3000 - 470,000 ug/kg
- PCBs ranging from 28,000-40,000 ug/kg
- high DDT levels have significant impact on SQG values

mERMq Results:

Study Name	Station	Chemical	Conc. (mg/kg)	ERMq
Vertical Profiles	8C	DDTs	222.9	4,835
		PCBs	45.2	251
PV and Santa Monica Bay		Cr	1,267	3.42
		Pb	523	2.29

Toxicity Results:

- Only 3 of the 11 site had significant toxicity to amphipods.

CSTF vs National Comparison:

ERMq Range	% Toxic Samples CSTF	% Toxic Samples NOAA
<0.1	16	9
0.11-0.5	35	21
0.51-1.5	55	50
>1.5	75	76

ERMq, No DDT:

	Level I	Level II
Toxicity Efficiency	39.7%	75.8%
Toxicity Sensitivity	82.4%	6.7%
Nontoxicity Efficiency	84.5%	70.1%
Nontoxicity Specificity	43.4%	99.0%

mERMq ROC curve, no DDT:

- ROC area under the curve =0.69

AETs:

	Level I	Level II
Toxicity Efficiency	26.9%	37.3%
Toxicity Sensitivity	76.7%	59.9%
Nontoxicity Efficiency	76.6%	75.1%
Nontoxicity Specificity	34.4%	54.6%

EqP:

	Level I	Level II
Toxicity Efficiency	26.9%	14.3%
Toxicity Sensitivity	6.4%	0.5%
Nontoxicity Efficiency	70.5%	70.5%
Nontoxicity Specificity	92.8%	98.9%
EqP sum ROC Curve	0.42	0.42

Comparison of CSTF and BPTCP:

	Percent Toxic Samples							
	CSTF	7	18	25	41	43	45	42
BPTCP	32	30	36	60	70	78	95	
SQGQ1 Range	<0.1	<0.2	<0.5	>0.5	>1.0	>1.5	>2.3	

SQG-Q1 Results:

	Level I	Level II
Toxicity Efficiency	36.4%	48.6%
Toxicity Sensitivity	95.7%	17.9%
Nontoxicity Efficiency	92.7%	71.1%
Nontoxicity Specificity	24.3%	91.4%

mSQG-Q1 ROC Curve:

ROC area under curve = 0.66

Consensus Results:

	Level I	Level II
Toxicity Efficiency	32.3%	40.6%
Toxicity Sensitivity	100.0%	85.6%
Nontoxicity Efficiency	100.0%	87.0%
Nontoxicity Specificity	5.4%	43.5%

Consensus ROC Curve:

ROC area under curve = 0.70.

Level I performance:

	Nontoxicity Efficiency	Specificity
ERM	83%	42%
AET	75%	34%
EqP	70%	90%
SQGQ1	90%	27%
Consensus	98%	7%

\* % Nontoxic Samples = 69%

Level II Performance:

	Toxicity Efficiency	Sensitivity
ERM	75%	7%
AET	35%	60%
EqP	10%	2%
SQGQ1	50%	20%
Consensus	37%	80%

\* % Toxic Samples = 35%

Recommendations:

1. Summarize results to date and get feedback from TAC;
2. Drop EqP and AET from further analysis as having the least likely utility;
3. Follow analysis with dredge data only (eliminating monitoring data) for Los Angeles area only, or just restrict to harbor (POLA, POLB, MdR);
4. Continue to "tweak" remaining SQGs for better fit.

Next Meeting: March 18, 2003, 10am - 12 am at Port of Los Angeles.