California Ocean Plan Reasonable Potential Analysis and RPcalc Software

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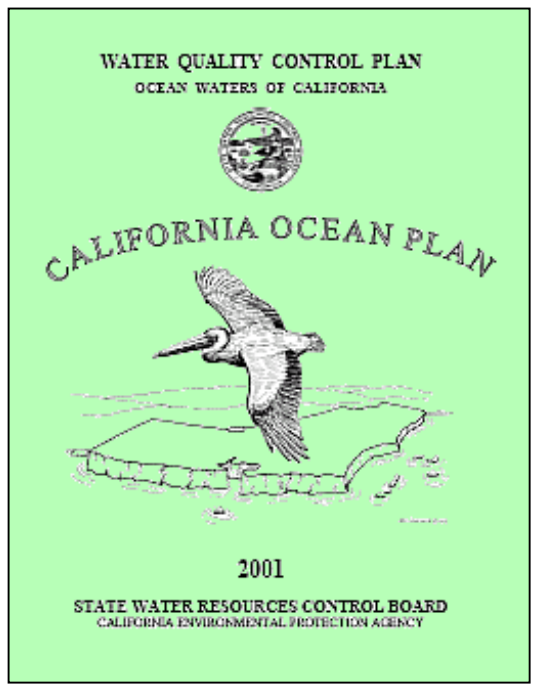
New Appendix VI:

Reasonable Potential Analysis Procedure for determining which Table B Objectives require effluent limitations

http://www.swrcb.ca.gov/plnspols/oplans/index.html

Ocean Plan Table B
Water Quality Objectives

- 83 Total Objectives that regulate 128 Pollutants
- Marine Aquatic Life – 21 Objectives
- Human Health – 62 Objectives
  - Non-carcinogenic Effects
  - Carcinogenic Effects



Marine Aquatic Life

TABLE B
WATER QUALITY OBJECTIVES

	Units of Measurement	Limiting Concentrations: 6-Month Median	Daily Maximum	Instantaneous Maximum
OBJECTIVES FOR PROTECTION OF MARINE AQUATIC LIFE				
Arsenic	ug/l	8.	32.	80.
Cadmium	ug/l	1.	4.	10.
Chromium (Hexavalent) (see below, a)	ug/l	2.	8.	20.
Copper	ug/l	3.	12.	30.
Lead	ug/l	2.	8.	20.
Mercury	ug/l	0.04	0.16	0.4
Nickel	ug/l	5.	20.	50.
Selenium	ug/l	15.	60.	150.
Silver	ug/l	0.7	2.8	7.
Zinc	ug/l	20.	80.	200.
Cyanide (see below, b)	ug/l	1.	4.	10.
Total Chlorine Residual (For intermittent chlorine sources see below, c)	ug/l	2.	8.	60.
Ammonia (expressed as nitrogen)	ug/l	600.	2400.	6000.
Acute* Toxicity	TUa	N/A	0.3	N/A
Chronic* Toxicity	TUc	N/A	1.	N/A
Phenolic Compounds (non-chlorinated)	ug/l	30.	120.	300.
Chlorinated Phenolics	ug/l	1.	4.	10.
Endosulfan	ug/l	0.009	0.018	0.027
Endrin	ug/l	0.002	0.004	0.006
HCH*	ug/l	0.004	0.008	0.012

Ocean Plan Appendix III Standard Monitoring Procedures

- Provides direction for Regional Board on the implementation of the Ocean Plan
- Compliance with Table B Objectives
  - Certified labs using 40 CFR 136 Methods
  - Monitoring Schedule based on discharged flow

Discharged Flow	Monitoring Frequency
Less than 1 MGD	One scan in permit life
Between 1 and 10 MGD	One scan annually
Greater than 10 MGD	One scan semi-annually

Reasonable Potential Analysis

- Required by Federal NPDES Regulations (40 CFR 122.44)
- Required by CA Water Code for POTWs (Sec 13263.6)
- Required by CTR and SIP for non-ocean discharges (Sec 1.3)

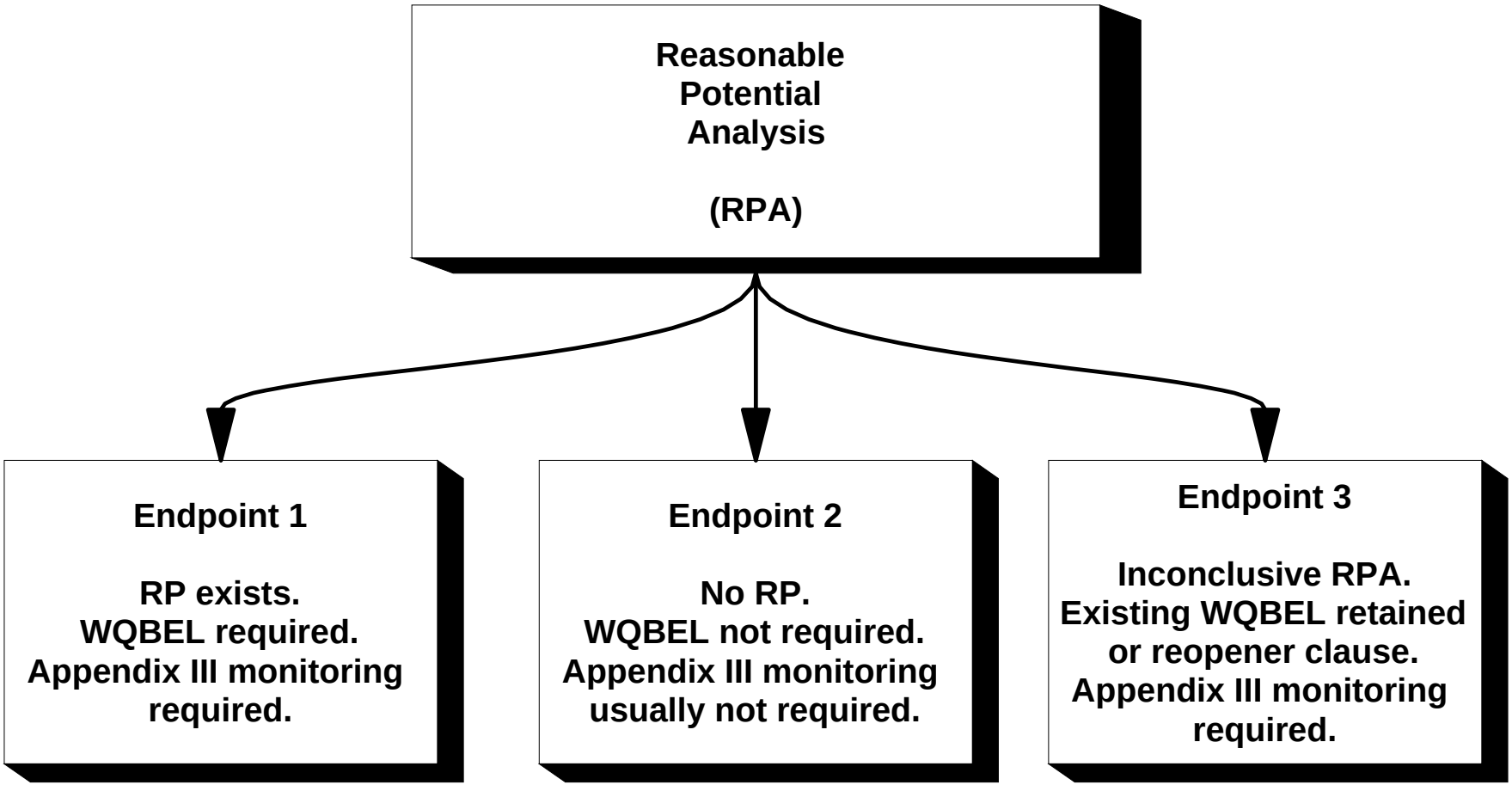
Why RP? The Old Way

- Previously,
  - NPDES Effluent Limits given for all Table B constituents
  - Monitoring according to Ocean Plan Appendix III Standard Monitoring Procedures
  - Dischargers could “certify” that a Table B constituent is not added to their effluent and be relieved of monitoring
- Net Effect:
  - Effluent Limit, but no Monitoring!

Why RP? The New Way

- Now,
  - NPDES Effluent Limits given for Table B constituents ***causing***, or having a ***reasonable potential to cause***, or ***contributing*** to an excursion of the Table B Water Quality Objective
  - Monitoring according to Ocean Plan Appendix III Standard Monitoring Procedures for those constituents having effluent limits
  - No discharger certification
- Net Effect:
  - Effluent Limit and Monitoring ***when RP exists***

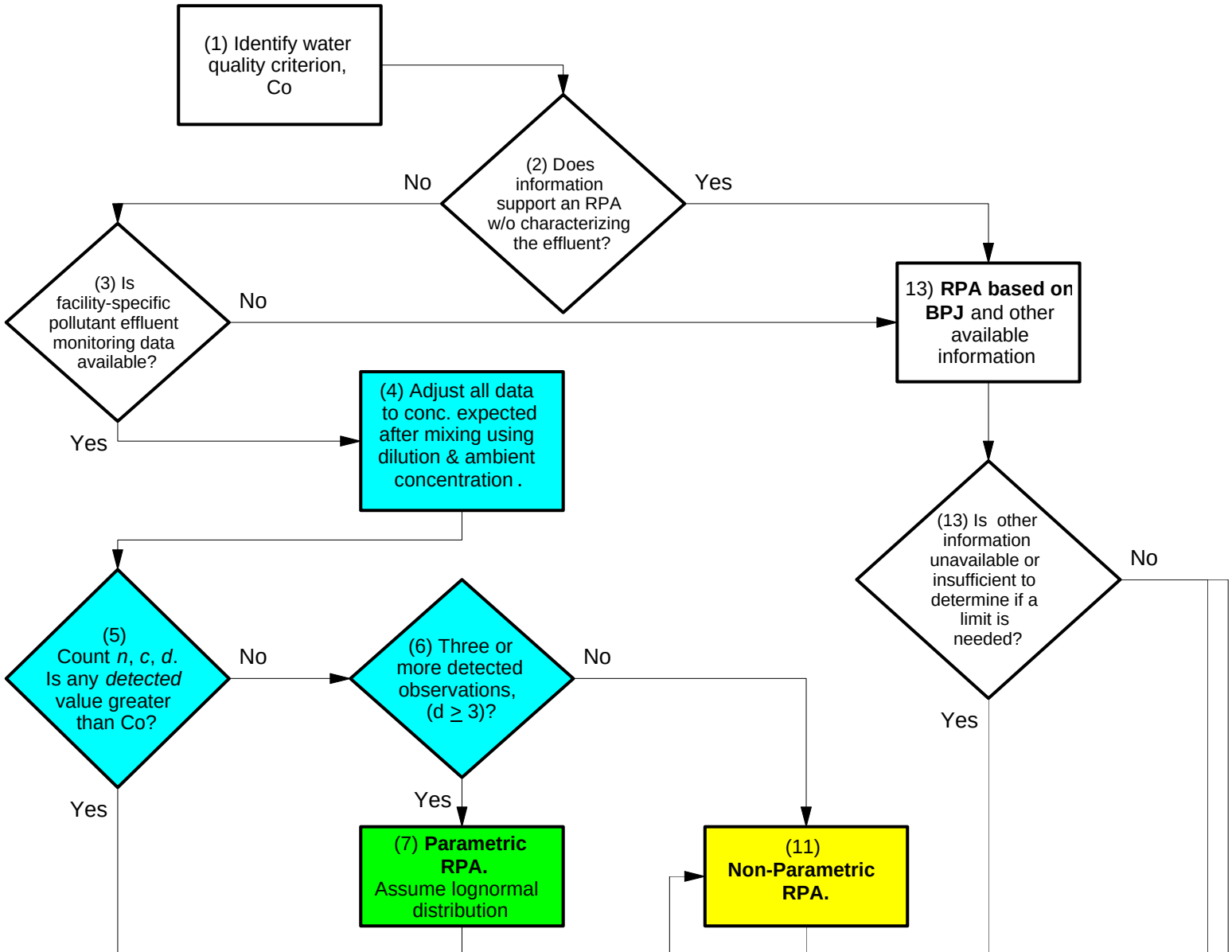
Ocean Plan endpoints of the reasonable potential procedure



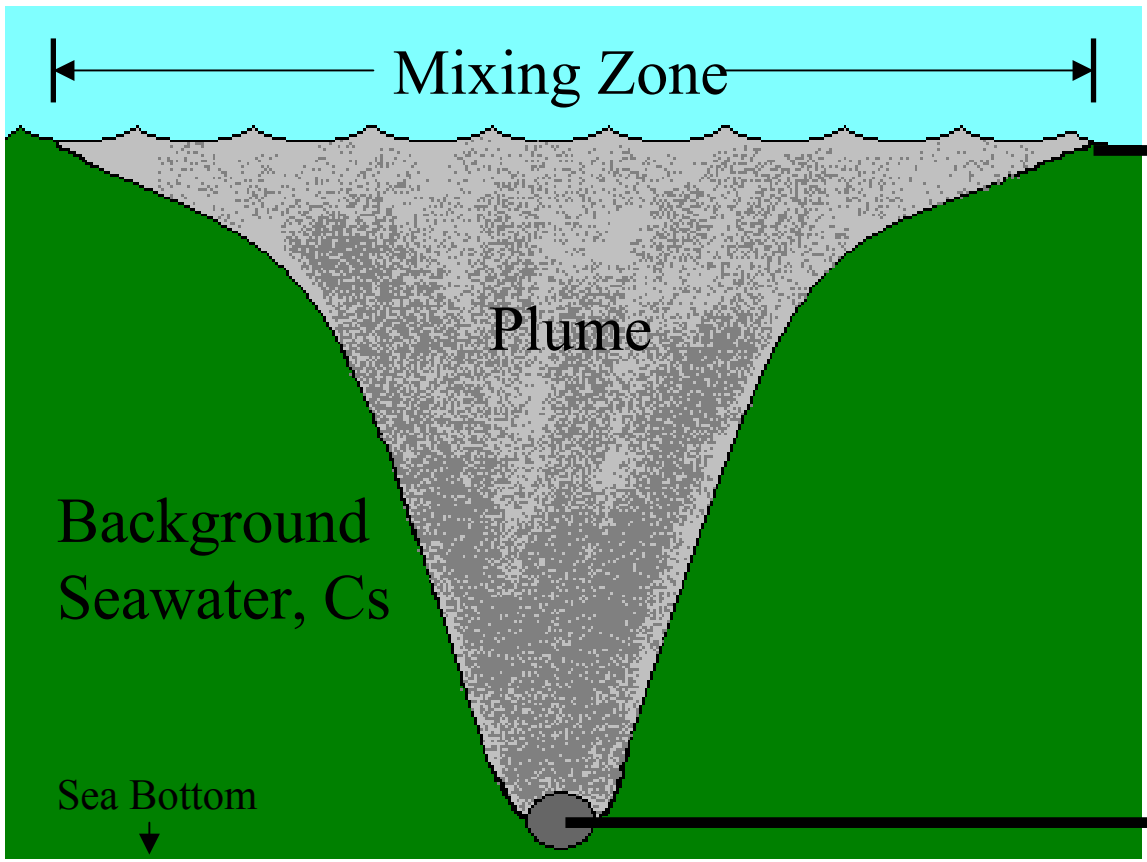
The Ocean Plan RPA

- Uses effluent monitoring data.
- Accounts for dilution (D_m) in mixing zones.
- Accounts for background seawater concentrations (Ocean Plan Table C).
- Accounts for effluent variability, small sample sizes, and the presence of "censored" data (i.e., non-detects and DNQs).

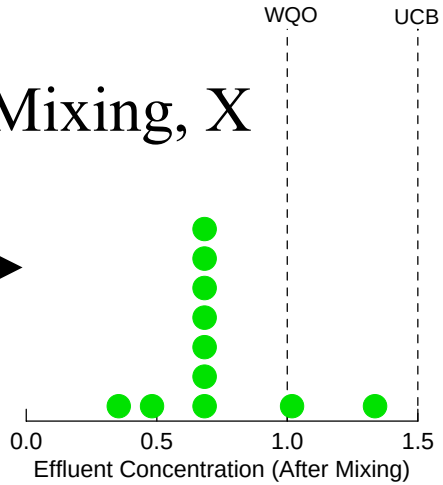
Ocean Plan RPA Flowchart



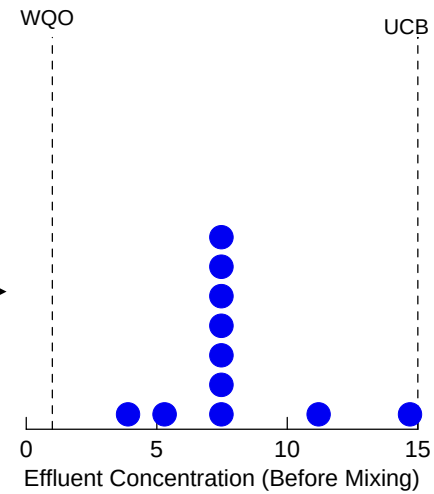
Adjust Effluent Data to Concentration Expected After Complete Mixing



After Mixing, X



Before Mixing, Ce



Use Mass Balance, $X = (Ce + Dm \bullet Cs)/(Dm+1)$

Ocean Plan Parametric RP test

An NPDES effluent limitation is needed if...

the one-sided upper 95% confidence bound for the 95th percentile of the "after mixing" pollutant distribution

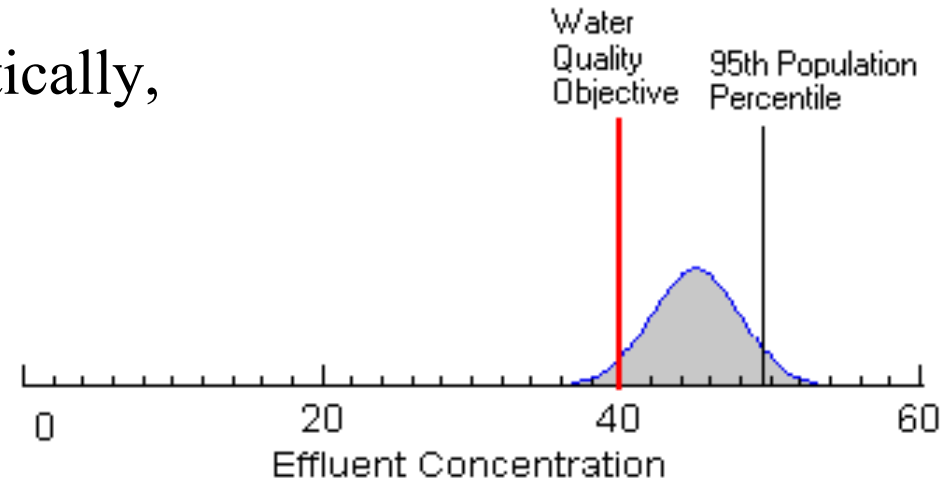
is greater than the...

i.e., the $UCB_{(.95, .95)}$

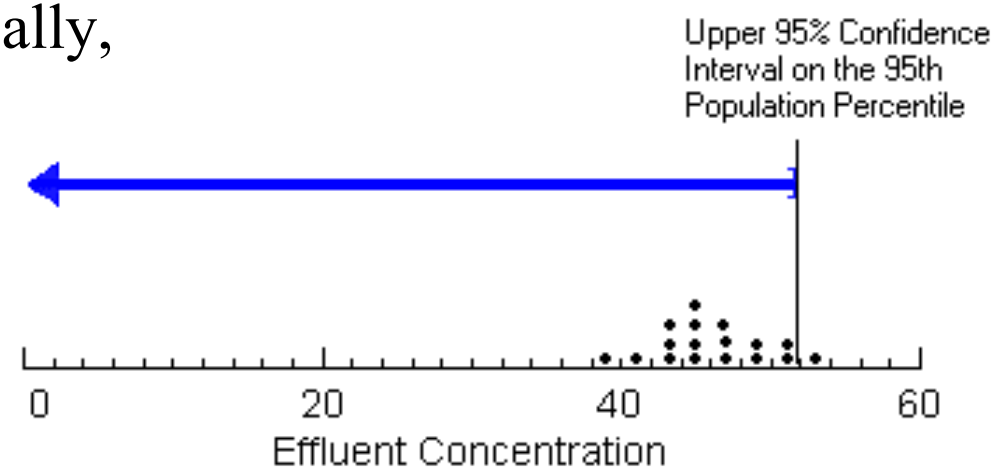
Ocean Plan Table B
Water Quality Objective.

Conceptual Framework

Theoretically,



Statistically,



For Censored Data, Use robust ROS

(Helsel & Cohn 1988)

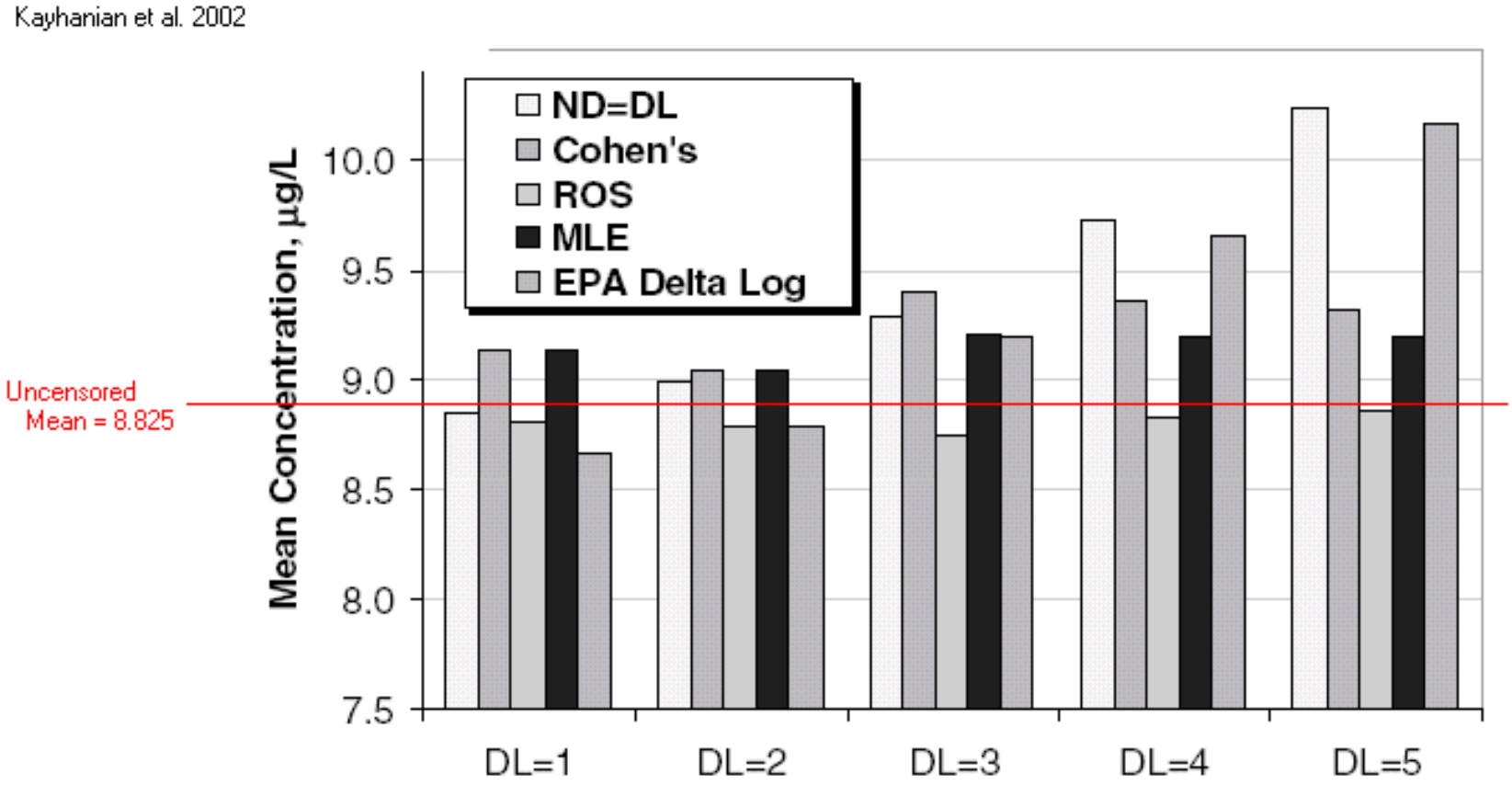
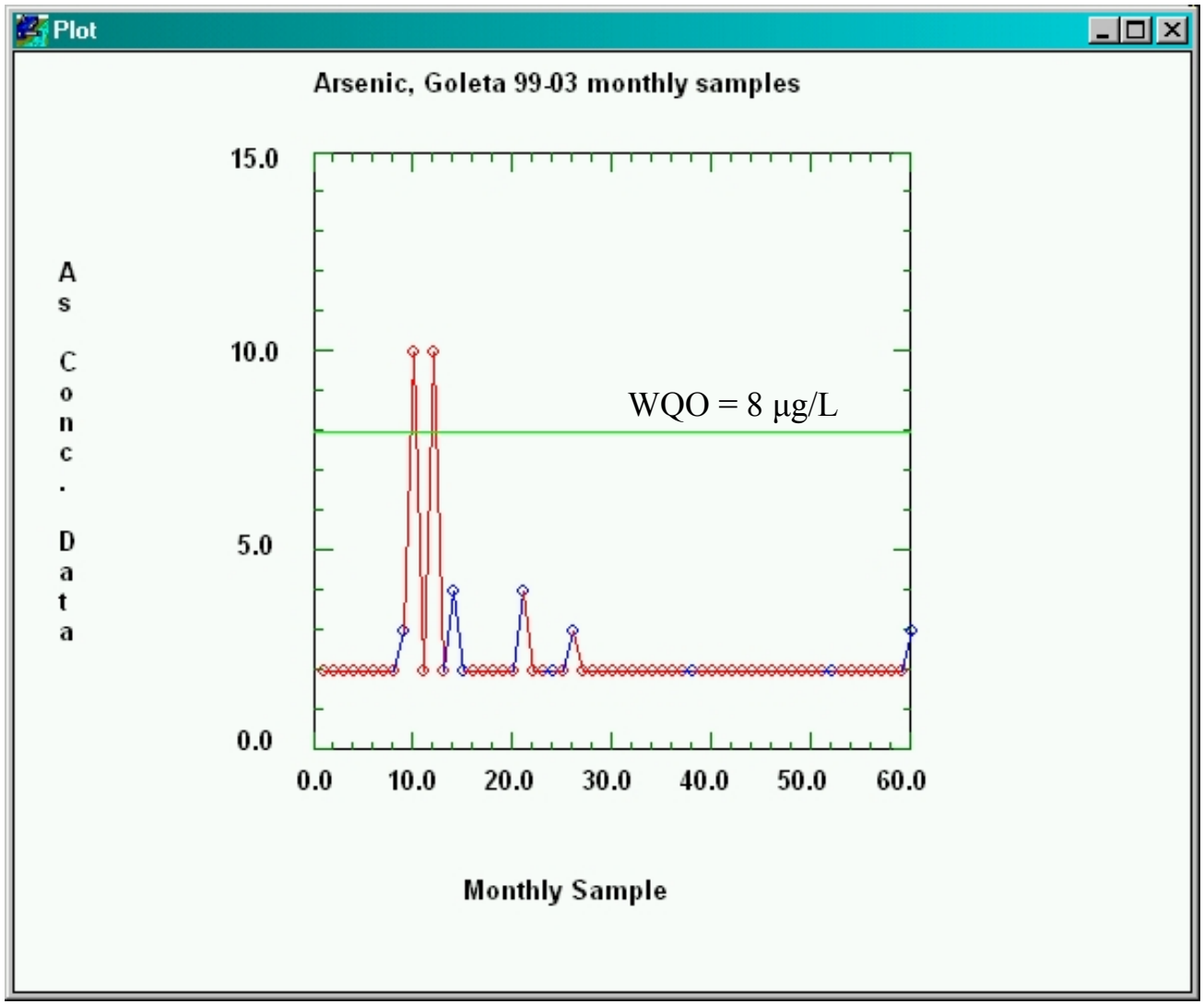


Figure 2 Influence of detection limit on Nickel mean concentration using different method of analysis

Helsel, DR and TA Cohn. 1988. *Estimation of Descriptive Statistics for Multiply Censored Water Quality Data*. Water Resources Research, Vol.24, No.12, pp. 1977-2004

Count ***conclusive*** non-exceedances when we can't use parametric methods



Arsenic Data:

60 samples

51 NDs (red dots)

9 quantified (blue)

85% censored data

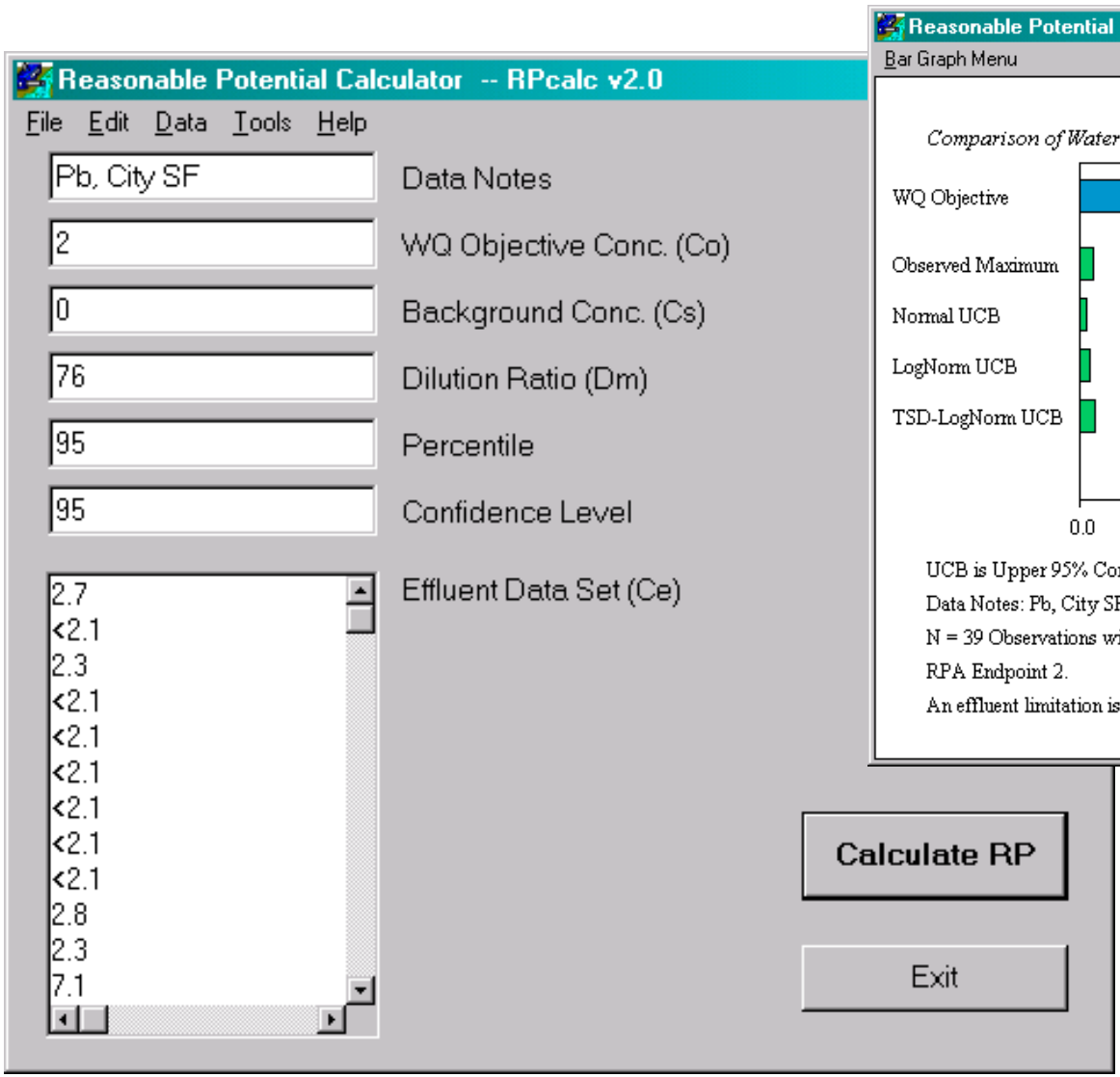
58 conclusive non-exceedances

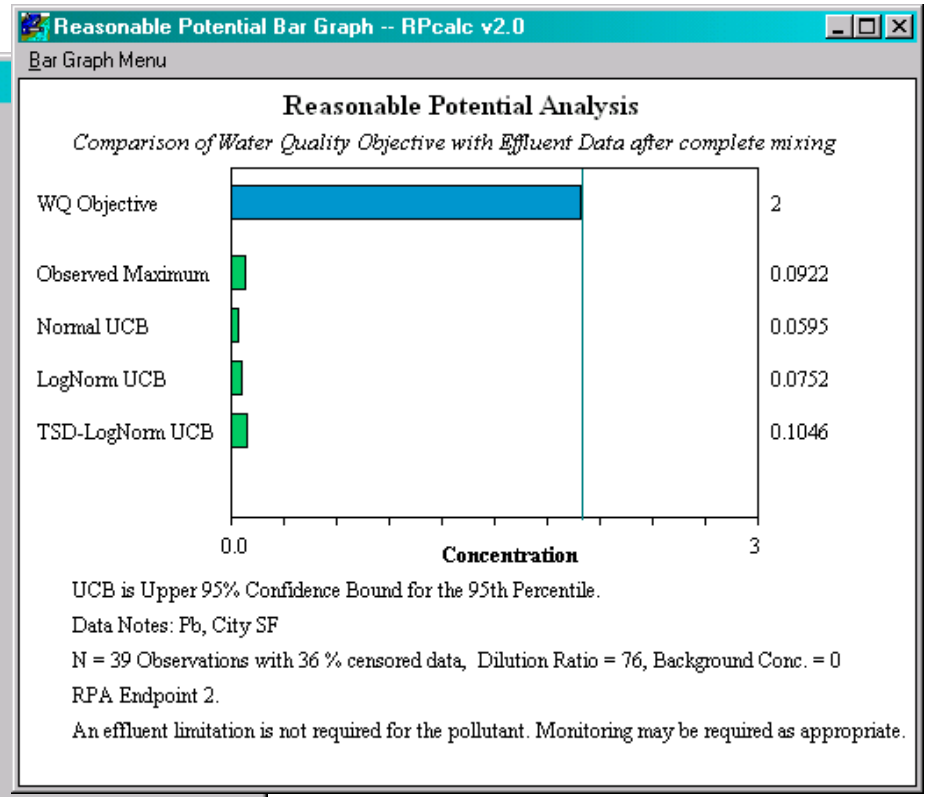
2 "ties"

Conclusion: No RP

RPcalc Software

Conducts RP analysis using Ocean Plan Flowchart





Developed by Ocean Standards Unit

Download at http://www.swrcb.ca.gov/plnspols/oplans/index.html

What's Next for Ocean Plan Monitoring?

Monitoring relief for regulated facilities that have a *demonstrated* record of good compliance and pollutant discharges at levels below permit requirements.

USEPA's 1996 INTERIM GUIDANCE FOR PERFORMANCE-BASED REDUCTION OF NPDES PERMIT MONITORING FREQUENCIES

http://www.epa.gov/npdes/pubs/perf-red.pdf