ASSIMILATIVE CAPACITY EXAMPLE: TOTAL PHOSPHORUS IN LAKE WATERSHEDS

I. Estimate a naturally occurring value for P =.011 mg/l from the discussion paper titled "A REFERENCE CONDITION METHOD FOR QUANTITATIVE APPLICATION OF THE "NATURALLY OCCURRING" STANDARD", May 20, 2005

II. From the 2006 CALM, the [cha] numerical criterion is <10% of sample results within a year's record > .015 mg/l ch a

III. Use the relationship between [P] and [ch a] for NH lakes (from P. Trowbridge memo "Analysis of NHDES Data to Determine Preliminary Total Phosphorus Criteria for Freshwaters", August 5, 2005). The median annual [cha] for lakes that are impaired for ch a is .008 mg/l. Using the regression relation:

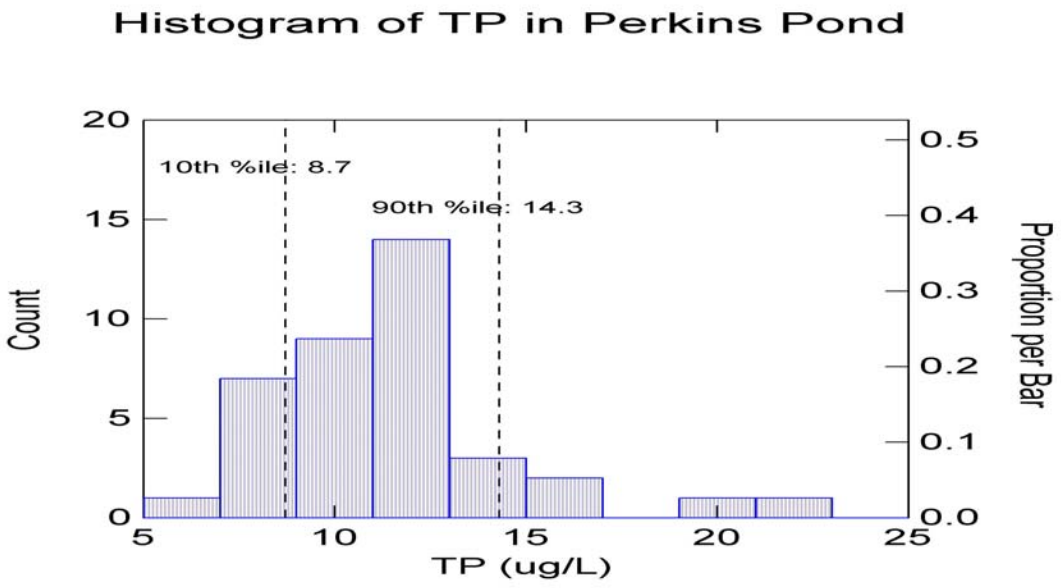
Log [cha]=0.925*log[TP]+2.468 r2=0.617 where [cha] is in ug/l and [TP] is in mg/l

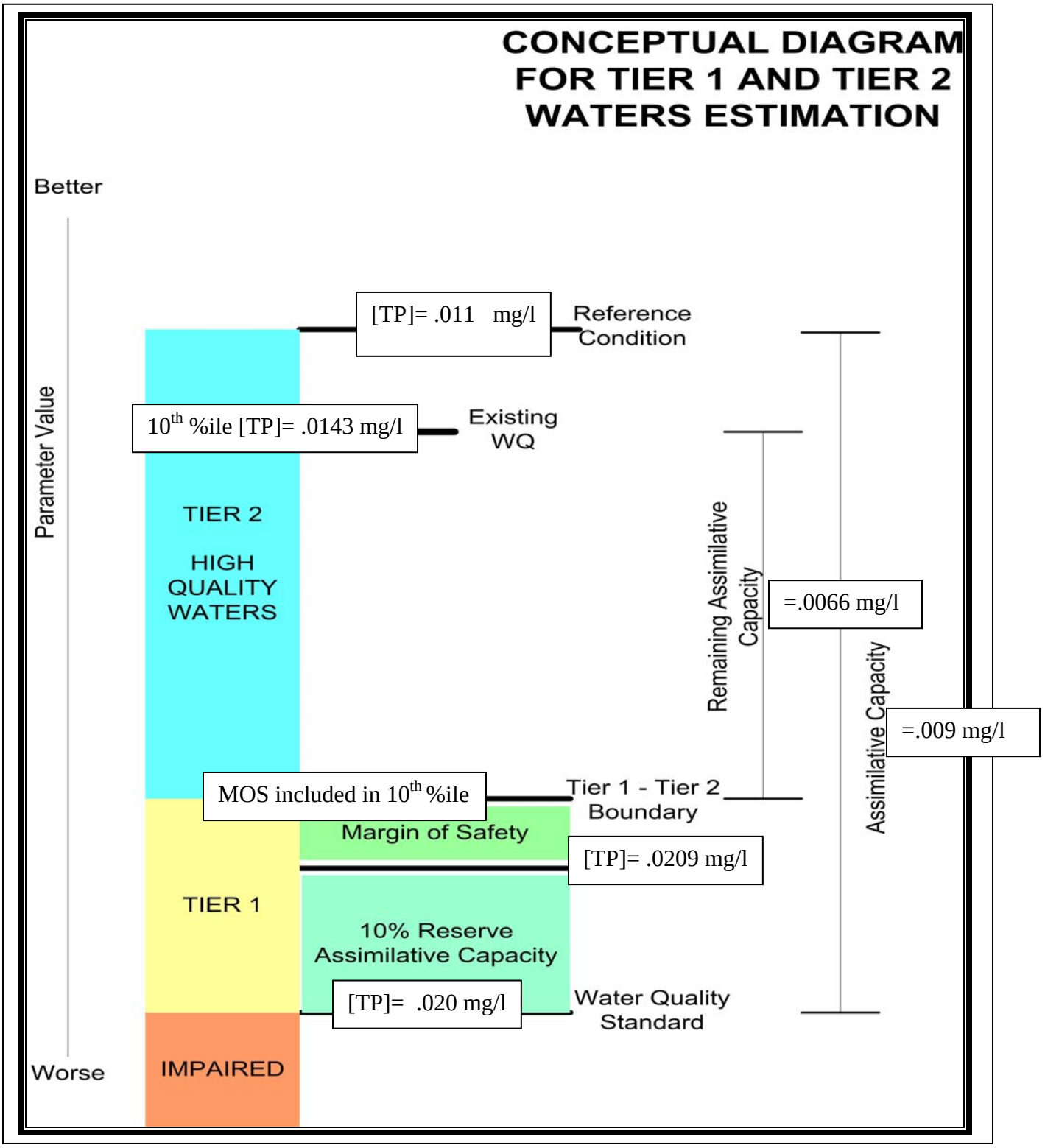
The [TP] value corresponding to a [cha] of .008 mg/l is .020 mg/l

IV. So the total assimilative capacity of any lake is (.020 - .011) = .009 mg/l of TP in-lake concentration

V. See the figure below for the [P] data for Perkins Pond, and the 10th %ile, for 2000-2005

2000-2005 Combined hypolimnion and epilimnion data




CONCEPTUAL DIAGRAM FOR TIER 1 AND TIER 2 WATERS ESTIMATION
Better
Parameter Value
Worse
[TP]= .011 mg/l
Reference Condition
10th %ile [TP]= .0143 mg/l
Existing WQ
TIER 2
HIGH QUALITY WATERS
Remaining Assimilative Capacity
=.0066 mg/l
Assimilative Capacity
=.009 mg/l
MOS included in 10th %ile
Tier 1 - Tier 2 Boundary
Margin of Safety
[TP]= .0209 mg/l
TIER 1
10% Reserve Assimilative Capacity
[TP]= .020 mg/l
Water Quality Standard
IMPAIRED