

## Appendix D - Chemistry Ranges, Averages and Q-Values

Chapter 4 listed values representing the likely ranges into which your chemical data results may fall. These ranges were taken from the 2012 Monitoring Water in Indiana: Choices for Nonpoint Source and Other Watershed Projects or also known as the Environmental Indicators Manual. This manual can be accessed at <https://engineering.purdue.edu/watersheds/monitoring/MonitoringWaterinIndiana.2012.1.pdf>. Data from existing monitoring sites in Indiana have been compiled to provide a range. These ranges are provided to help you have a better idea of what is found in Indiana streams and lakes. This section relied on IDEM Fixed Station Data, compiled by IDEM staff or Purdue University. In addition, the Indiana water quality standards for rivers are included for each applicable parameter.

Typical range for DO =  
1.2 to 22.3 mg/L  
Indiana Average = 9.6 mg/L

State Water Quality Standard:  
4.0 mg/L - 12.0 mg/L  
Min: 6.0 mg/L in coldwater fishery streams  
Min: 7.0 mg/L in spawning area of coldwater fishery streams

The maximum temperature rise at any time or place above natural temperatures shall not exceed State Water Quality Standard:

< 5° F (approximatively 2.8° C)  
< 2° F (approximatively 1.1° C) for trout streams

Typical range for *E. coli* =  
2 to 1,204 K colony forming  
units/100mL  
Indiana Average = 210 cfu/100mL

State Water Quality Standard for total body contact recreation: <235 cfu/100 mL (a single sample)  
or  
< 125 cfu/100 mL (Geometric mean of 5 samples equally spaced over 30 days)

Typical range for NITRATE (NO<sub>3</sub>)  
= 0 to 36.08 mg/L  
Indiana Average = 12.32 mg/L  
EPA recommends 1.5 mg/L as the dividing line between mesotrophic and eutrophic streams.

Typical range for Turbidity:  
0 to 2150 NTU

Indiana Average = 15 NTU  
U.S. EPA recommends 10.4 NTU

Typical range for pH = 7.2 to 8.8 SU  
Indiana Average = 8.0 SU

State Standard = between 6 - 9  
Due to the state's limestone geology, Indiana surface waters will typically have a pH that is relatively basic (> 7).

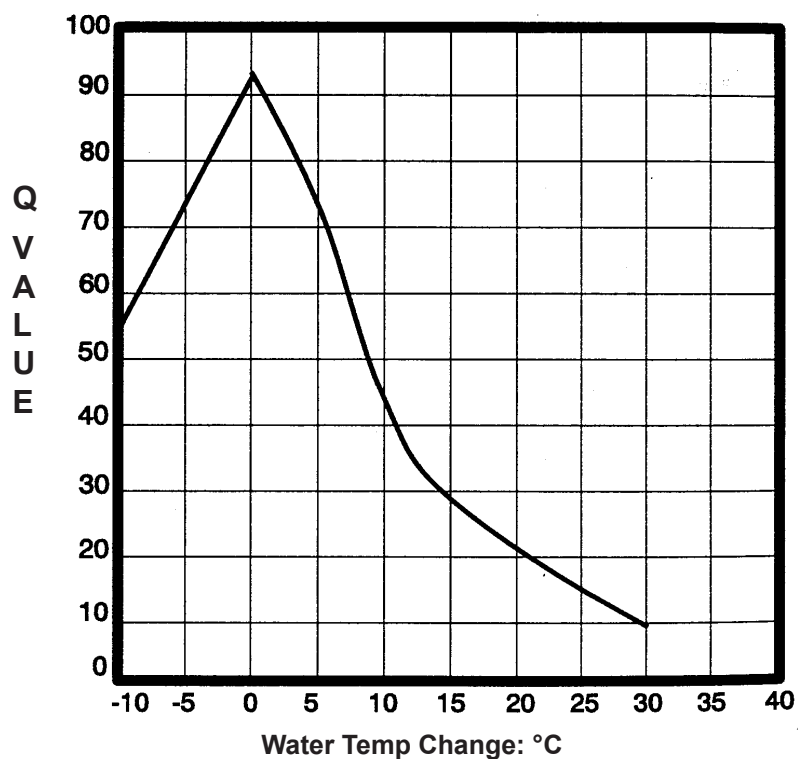
There are no state water quality standards for Orthophosphate.

Total Phosphate typical range:  
(0 to 0.85 mg/L) and average (0.05 mg/L).

Typical range for BOD<sub>5</sub> =  
**0.4 to 33 mg/L**  
Indiana Average = 2 mg/L

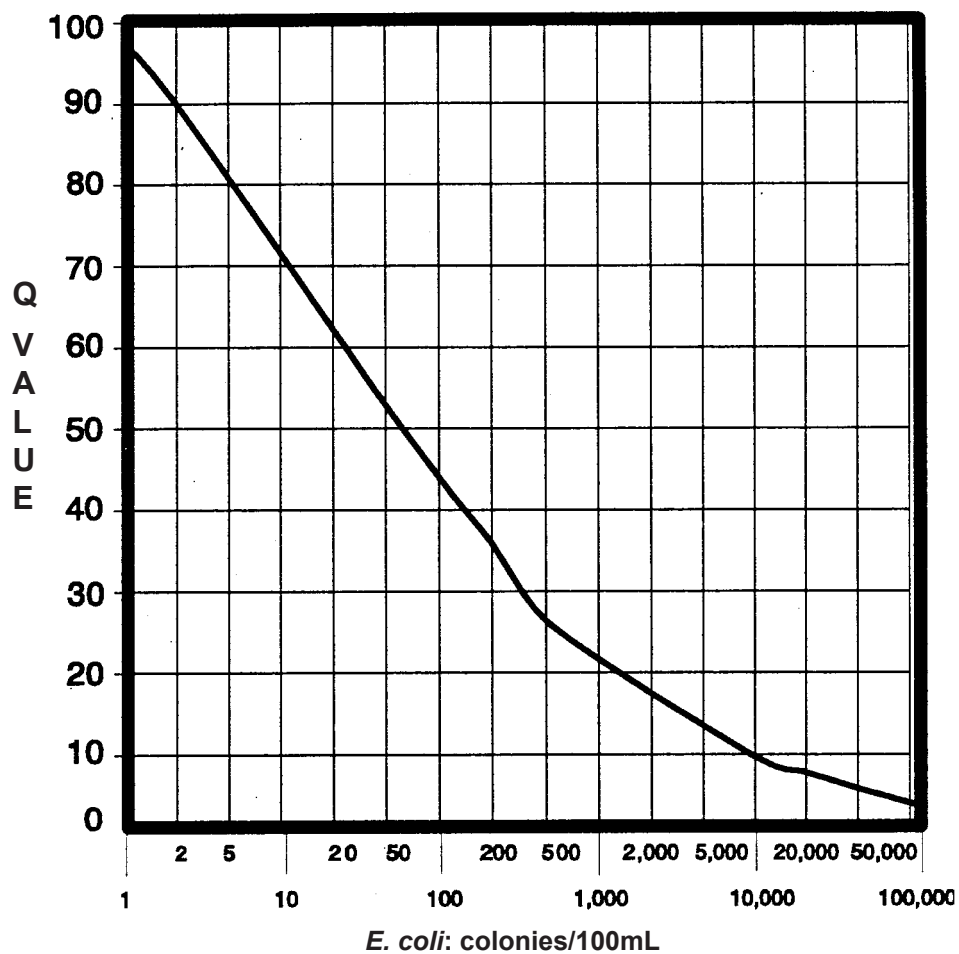
We generally expect orthophosphate to be less than total phosphate, since orthophosphate is but one component of total phosphate.

## Temperature Change Q-Values



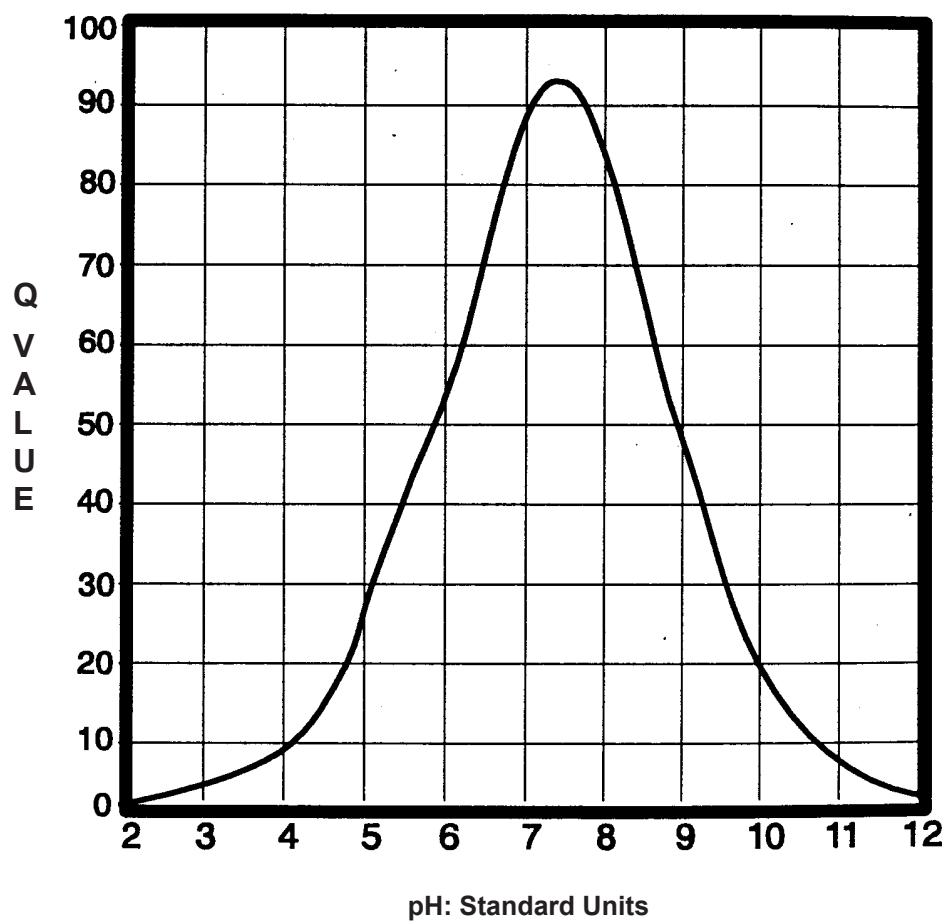
Change in Temp. (°C)	Q-Value
-10	56
-7.5	63
-5	73
-2.5	85
-1	90
0	93 (max)
1	89
2.5	85
5	72
7.5	57
10	44
12.5	36
15	28
17.5	23
20	21
22.5	18
25	15
27.5	12
30	10

## E. coli Q-Values



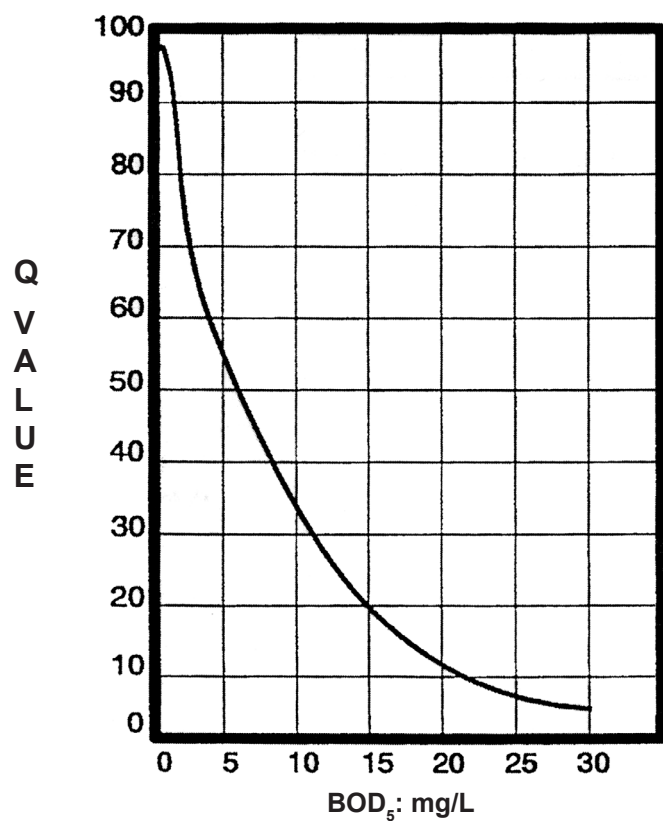
<i>E. coli</i> (colonies/100mL)	Q-Value
0-1	98
2	89
5	80
10	71
20	63
50	53
100	45
200	37
500	27
1,000	22
2,000	18
5,000	13
10,000	10
20,000	8
50,000	5
100,000	3
>100,000	2

## pH Q-Values



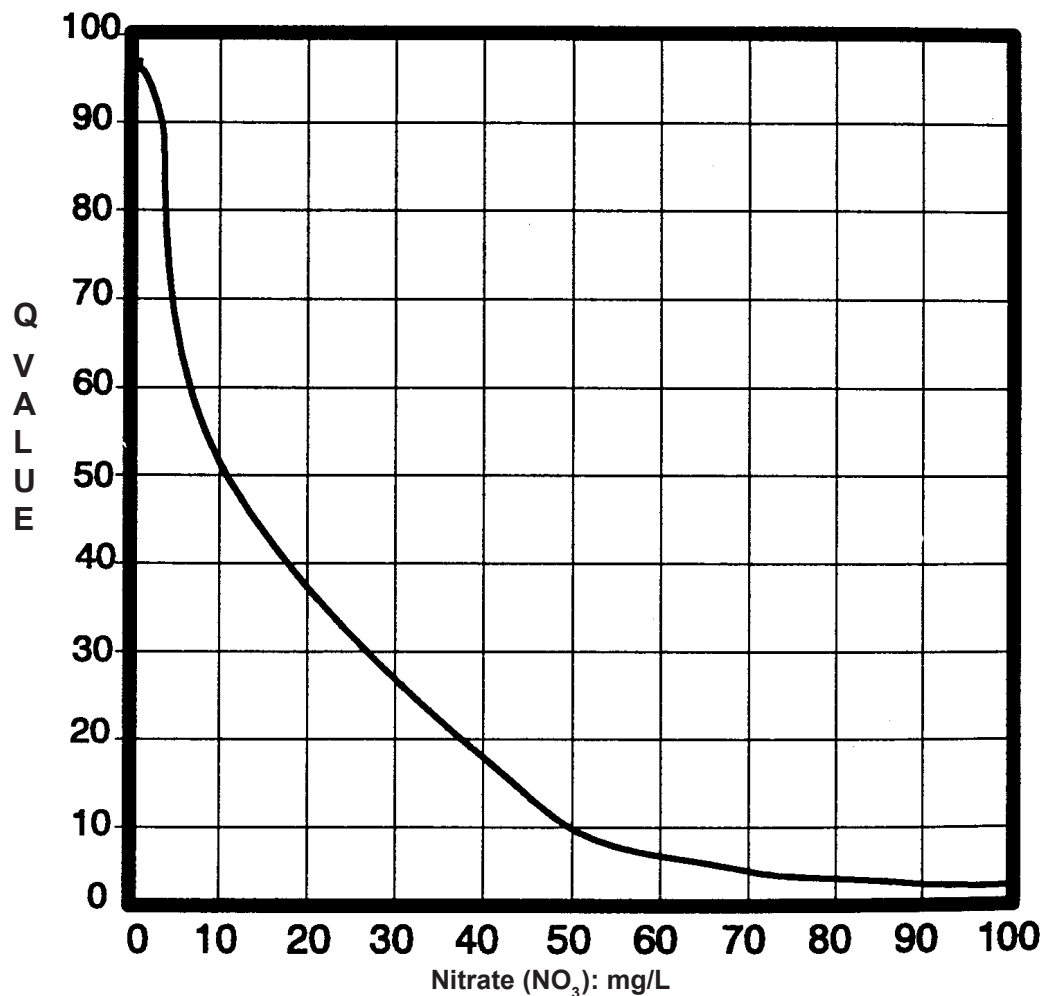
pH (SU)	Q-Value
<2	0
2	2
3	4
4	8
5	24
6	55
7	90
7.2	92
7.5	93 (max)
7.7	90
8	82
8.5	67
9	47
10	19
11	7
12	2
>12	0

## BOD<sub>5</sub> Q-Values



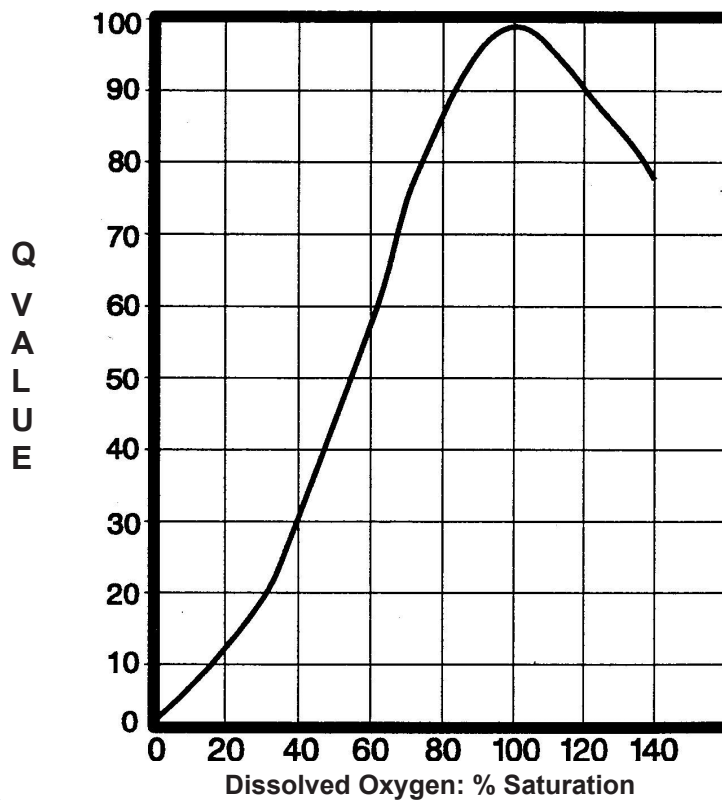
BOD <sub>5</sub> (mg/L DO)	Q-Value
0	96
1	92
2	80
2.5	73
3	66
4	58
5	55
7.5	44
8	40
10	33
12.5	26
15	20
17.5	16
20	14
22.5	10
25	8
27.5	6
30	5
>30	2

## Nitrate (NO<sub>3</sub>): Q-Values



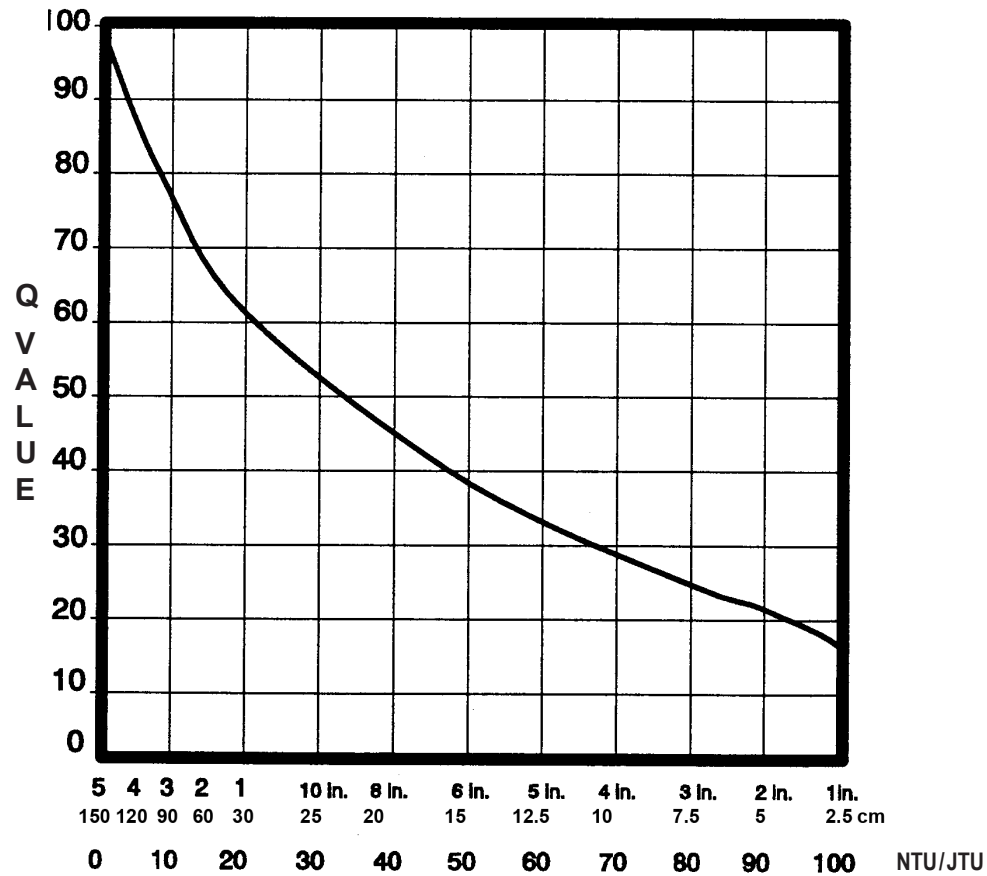
Nitrate (mg/L NO <sub>3</sub> )	Q-Value
0	98
0.25	97
0.5	96
0.75	95
1	94
1.5	92
2	90
3	85
4	70
5	65
10	51
15	43
20	37
30	24
40	17
50	7
60	5
70	4
80	3
90	2
100	1
>100	1

## Dissolved Oxygen Q-Values



DO (% Saturation)	Q-Value
0	0
10	8
20	13
30	20
40	30
50	43
60	56
70	77
80	88
85	92
90	95
95	97.5
100	99
105	98
110	95
120	90
130	85
140	78
>140	50

## Turbidity Q-values

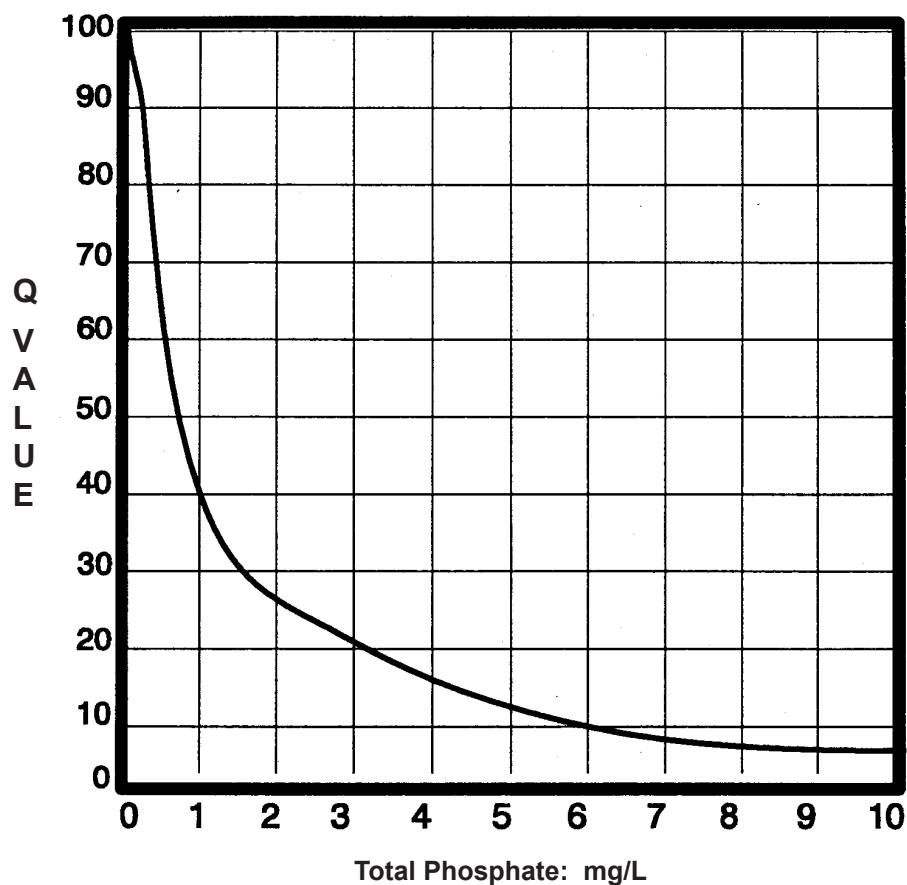


Turbidity: inches or cm or NTU/JTU

Transparency (cm) Reading from Tube	Turbidity (NTU) (Approximate)	Q Value
150	0	97
120	5	85
90	10	76
67.5	13	70
60	15	68
30	20	62
27.5	25	57
25	30	53
22.5	35	48
20	40	45
15	50	39
12.5	60	34
10	70	28
7.5	80	25
5	90	22
2.5	100	17
<2.5	>100	5

## Total Phosphate (PO<sub>4</sub>) Q-Values

The Total Phosphate Q-value graph and table are provided for your general information. A Total Phosphate result cannot be obtained using the methods provided in this manual.



Total Phosphate (mg/L P)	Q-Value
0	99
0.05	98
0.1	97
0.2	95
0.3	90
0.4	78
0.5	60
0.75	50
1	39
1.5	30
2	26
3	21
4	16
5	12
6	10
7	8
8	7
9	6
10	5
>10	2

### REMEMBER:

There are no Q-value charts or tables for Orthophosphate or Nitrite (NO<sub>2</sub>).