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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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TO: John Bernhardt  
FROM: David Hallock *DH* ✓  
SUBJECT: 1988 Water Quality Index  
DATE: June 10, 1988

The purpose of this memo is to record the procedures used to produce the 1988 Water Quality Index (WQI) and to present the results of the 1988 WQI analysis.

Memos from Lynn Singleton and Joseph Joy to John Bernhardt (May 22, 1981), David Hallock to Ed Rashin (February 26, 1988 [Attachment 1]), and David Hallock to John Bernhardt (March 28, 1988) are summarized in the following discussion:

Introduction

The WQI is a unitless number, ranging from 0 to 100, that is derived from ambient monitoring data by comparing measured values to specified criteria. Criteria were developed by a national study group and modified to better assess Washington State water quality characteristics. The following variables were included in the 1988 WQI:

1. Temperature
2. Oxygen
3. Bacteria
4. pH
5. Turbidity
6. Nutrients (N and P)
7. Suspended Sediment
8. Ammonia Toxicity

For marine stations, only the first five variables were included.

The higher the WQI, the worse the water quality. For the first four variables, above, an index below 20 indicates that water segment meets state Class A standards. For the other variables, state standards do not exist or are not compatible with the WQI analysis. In general, scores between 0 and 20 meet the goals of the Federal Water Pollution Control Act, scores between 20 and 60 are considered marginal, and scores over 60 are unacceptable.

The WQI is produced for each variable by a computer program developed by Ray Peterson, EPA, Region X. This program determines a monthly WQI

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by averaging the WQI's for each month in the period selected; for example, for a five-year period the January WQI would be an average of five Januarys. WQI's are determined by converting field data to an index based on the appropriate criteria curve. The final WQI for a given variable is the average of the highest three consecutive months. A monthly overall WQI is calculated by averaging the monthly WQI for each variable, including a penalty for values over 20:

$$((\sum \text{WQI's} + [\sum (\text{WQI's} > 20 - 15)]) / \# \text{ of WQI's})$$

(No penalty is applied to turbidity.) The final overall WQI is the average of the highest three consecutive months of the monthly overall WQI.

#### Procedures Used in the 1988 WQI Analysis

The analyst can direct the WQI program in a number of ways including the variables to be evaluated, the number of years to include in the index, the criteria curve for each variable, and the weight of each variable in the overall WQI. The analyst can even use different criteria curves for different seasons.

The analyst decides which stations and how many years of data to include in the index. For the 1988 analysis, "current" stations had had sufficient data (one sample per quarter for four consecutive quarters except for marine stations) collected any time in the five water years (WY) prior to the analysis. This five-year average masks anomalies in the data set and the effects of low or high water years, but may also mask actual changes in water quality. "Historic" stations were those with sufficient data in the five years preceding the current period (WY 1978 to 1982). Those stations where no data have been collected since 1978 are not included in the 1988 WQI. Even so, historic station WQI's should be used with extreme caution because of possible changes since those stations were sampled last.

I used the same criteria curve for a given variable as was used in the past, except for the addition of a marine temperature curve. The actual curves used are available on request. Most variables have several criteria curves (for example, one for cold water, one for warm water, one for spawning and rearing, etc.). In general, only the cold water curve (at a WQI of 20) corresponds to state standards. The analyst can choose which curve to compare the station to. Usually, the cold water curve is used but there are exceptions.

All variables were weighted equally in determining the overall WQI. That is, temperature, for example, was not considered more important than turbidity. Nutrients and suspended sediment were compared to more stringent standards from June through October and less stringent standards from November through May. Some streams were designated as

"glacial" which set the maximum WQI for turbidity and suspended sediment at 25.

### General Comments

Consider the following before interpreting the WQI:

1. An index greater than 20 for temperature, oxygen, bacteria, and pH indicates water quality exceeded state standards at least once. Criteria for other variables are not based on standards.
2. Because the WQI is the mean of the highest three consecutive months, the index may be below 20 even when violations of standards occur. Violations may also be masked because the monthly index is an average for the period evaluated (five years).
3. The current station WQI's are in most cases, based on five years of data. The WQI's do not, therefore, indicate water quality for any given year. The degradation of a stream in WY 1987 may not be reflected in the 1988 WQI.
4. The overall WQI is not a simple mean but includes a penalty factor for WQI's greater than 20 (excluding turbidity).
5. Trends should not be inferred from WQI's without testing against raw data. There are two reasons for this: (a) trends are masked by averaging five years of data, and (b) the procedures used to determine the WQI may have changed from year to year (standards changes, different curves may be used, etc.).
6. The WQI is based on data from a single station. Use caution in extrapolating the index to entire basins or sub-basins.

### Results

The results of the 1988 Water Quality Index analysis are presented in the attached tables. These tables are also available as text files on diskette on request.

Table 1 contains the WQI sorted by Consolidated Planning Area number and sub-sorted by Water Body Tracking System number.

Table 2 contains the WQI sorted by Ecology Region and sub-sorted by Ambient Monitoring Station number.

Table 3 contains a listing of the ten worst stations in the state for each variable.

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The South Fork of the Palouse River in Pullman (34B110) is again unchallenged as the station with the worst water quality index in the state (WQI=100), primarily due to high nutrients and bacteria. The closest competitors are the Duwamish River at Allentown Bridge (WQI=50, primarily bacteria), the Palouse River at Hooper (WQI=49, primarily turbidity), and Grays Harbor at Rennie Island (WQI=49, primarily bacteria). The variable contributing the most to low water quality in general is bacteria.

The Water Quality Index analysis is now on dBase III+ and can be sorted and manipulated in a number of ways. We want the WQI to convey usable information in a straight-forward way. Toward that end, we welcome any recommendations you may have to help us better produce and report the WQI.

DH:cp  
Attachment

cc: Bea McKamey  
Lynn Singleton  
Ray Peterson  
Ruth Schaefer  
Brad Hopkins  
Will Kendra  
Erin Guthrie  
Sue Davis, Thur. Co. Health

Joe Joy  
Ed Rashin  
Jerry Thielen  
Bob Monn  
Norm Glenn  
Bill Yake  
Glen Crandal

Dick Cunningham  
Russ Taylor  
Nancy Ellison  
John Arnquist  
Clark Haberman  
Rod Sakrison

Table 1. 1988 water quality index analysis sorted by Consolidated Planning Area Number (CPAN).

Station Number	Name	Water Body Tracking System	Yrs In	Seg. Anal Class	Seg. Size	Temp	Oxy	pH	Bact	Nutr	Turb	Sed	Tox	All	WQI	Comments	
																	17
** CPAN Number: 01-01-01																	
DRA001	Y Drayton Hbr Entrance Channel	WA-01-0020	5	A		17	9	13	25	*	2	*	*	*	13	N	Industrial sewage and waste (fish processing) (recently corrected).
** CPAN Number: 01-01-02																	
BLA008	Y Bellingham Bay at Post Point	WA-01-0040	5	A		11	14	10	21	*	3	*	*	*	10	X-N	
BLA009	Y Bellingham Bay nr Pt. Frances	WA-01-0040	5	A		12	10	11	17	*	9	*	*	*	8	X-N	
BLA010	N Bellingham Bay nr Eliza Is.	WA-01-0040	3	A		11	11	9	2	*	2	*	*	*	6	Y	
** CPAN Number: 01-01-03																	
BLA006	Y Bellingham Bay & Nun Buoy #4	WA-01-0050	5	B		15	12	11	35	*	4	*	*	*	20	Y	Georgia Pacific Corp. pulp mill. Urban runoff.
** CPAN Number: 01-01-04																	
01A050	Y Nooksack R @ Brennan	WA-01-1010	5	A	25	11	7	4	28	12	21	20	0	20	Y		Nonpoint agr. runoff and dairy wastes. Glacial fed.
01A120	Y Nooksack R @ No Cedarville	WA-01-1020	5	A	12	7	6	3	9	9	21	21	0	12	N		Glacial fed.
** CPAN Number: 01-01-06																	
01D070	Y Sussas R nr Huntington BC	WA-01-2010	5	A	11	13	14	4	49	30	13	8	4	36	Y		Agricultural runoff.
** CPAN Number: 02-03-05																	
SEK001	Y Skagit Bay at Hope Island	WA-PS-0010	5	A	9	14	5	6	*	3	*	*	*	6	Y		
** CPAN Number: 02-03-06																	
03A060	Y Skagit R nr Mount Vernon	WA-03-1010	5	A	40	6	7	3	14	6	18	12	0	7	N		
** CPAN Number: 02-03-10																	
03B050	Y Samish R nr Burlington	WA-03-2010	5	A	25	8	7	4	31	10	20	12	0	16	Y		Cattle (dairy). Septic tank failures (?).
** CPAN Number: 02-04-07																	
04A060	Y Skagit R @ Concrete	WA-04-1010	5	AA	30	4	5	4	5	5	8	8	0	4	N		
04A100	Y Skagit R @ Marblemount	WA-04-1050	5	AA	30	1	5	4	4	5	3	5	0	3	N		
04B070	Y Baker R @ Concrete	WA-04-1020	5	AA	1	6	7	4	3	6	7	4	0	4	N		Inauf. data. Summer samples only.
04B150	N Baker Lake @ Boulder Cr	WA-04-1060	3	AA	40	3	6	4	6	5	12	3	0	10	N		Glacial fed.
04C070	Y Sank R nr Rockport	WA-06-1080	5	AA													
** CPAN Number: 03-05-01																	
SUZ001	Y Port Susan at Kayak Point	WA-PS-0020	5	A	14	12	9	12	*	2	*	*	*	7	Y		
** CPAN Number: 03-05-02																	
05A070	Y Stillaguamish R nr Silvana	WA-05-1010	5	A	18	13	10	5	30	8	29	23	0	17	Y		Nonpoint agr. sources. Upstream landslide (Deer Cr).
** CPAN Number: 03-05-03																	
05B070	Y NF Stillaguamish @ Cicero	WA-05-1020	5	A	31	6	7	4	13	9	36	32	0	21	Y		Upstream landslide (Deer Cr).
** CPAN Number: 03-05-05																	
05A090	Y SF Stillaguamish @ Arlington	WA-05-1040	5	A	16	11	9	4	22	8	24	17	0	14	Y		Nonpoint agr. sources. Soil erosion.
** CPAN Number: 03-06-07																	
BLA001	Y Holmes Harbor at Honeycomb Bay	WA-06-0030	5	A	11	20	9	1	*	1	*	*	*	10	N		Urban runoff.
PNND01	Y Penn Cove near Penn Cove Park	WA-06-0020	5	A	12	15	10	9	*	2	*	*	*	7	N		Urban runoff.
SAR003	Y Saratoga Passage off East Pt	WA-06-0010	5	A	11	15	9	2	*	1	*	*	*	6	N		Urban runoff.
** CPAN Number: 03-07-08																	
PSS019	Y Possession Snd off E Gadney Is	WA-PS-0030	5	A	12	15	9	13	*	2	*	*	*	9	N		
** CPAN Number: 03-07-09																	
PSS008	Y Pt Gardner Bay at Pier 3	WA-07-0010	5	B	15	19	6	63	*	2	*	*	*	46	Y		Comb. sewer overflow. Weyerhaeuser and Scott Paper pulp mills. Urban runoff.
PSS015	Y Snohomish R at Highway 99 Brgs	WA-07-0010	5	A	24	14	12	62	*	4	*	*	*	47	Y		Comb. sewer overflow. Weyerhaeuser and Scott Paper pulp mills. Urban runoff.
PSS020	Y Ebey Slough near Marysville	WA-07-0010	5	A	24	17	10	52	*	5	*	*	*	44	Y		Comb. sewer overflow. Weyerhaeuser and Scott Paper pulp mills. Urban runoff.
** CPAN Number: 03-07-10																	
07A090	Y Snohomish R @ Snohomish	WA-07-1020	5	A	15	17	8	7	28	9	8	6	0	13	Y		Agr. runoff. Cattle (dairy, etc).
07A111	Y Snohomish R nr Monroe (USGS)	WA-07-1050	7	A	13	9	29	26	8	2	4	0	22				Cattle (dairy).
** CPAN Number: 03-07-11																	
07C070	Y Skykomish R @ Monroe	WA-07-1160	5	A	21	13	7	7	8	6	5	3	0	5	N		
** CPAN Number: 03-07-12																	
07C120	Y Skykomish R nr Gold Bar	WA-07-1200	5	AA	34	9	8	9	6	7	6	4	0	4	N		

Table 1. Continued.

Station Number	Name	Mater Body Tracking System	Yrs In	Seg. Size Anal Class (mi)	Temp	Oxy	pH	Bact	Nutr	Turb	Sed	Over- Tox all	WOL (?)	Comments
** CPAN Number: 03-07-13														
07D070	Y Snoqualmie R nr Carnation	WA-07-1060	5	A	25	12	7	8	12	7	6	4	0	6 N
07D130	Y Snoqualmie R @ Snoqualmie	WA-07-1100	5	A	20	7	8	5	8	8	6	4	0	5 Y
** CPAN Number: 03-07-19														
07B055	Y Plichuck R @ Snohomish	WA-07-1030	5	A	35	20	8	8	16	9	7	9	0	12 Y N Low summer flows.
		WA-07-1040												
** CPAN Number: 04-08-02														
08B070	Y Sammamish R @ Bothell	WA-08-1070	5	A	15	20	14	6	41	22	11	9	0	29 Y Originates in shallow lake. Septic tank seepage. Turf farm runoff.
		WA-08-1080												
		WA-08-1090												
		WA-08-1100												
** CPAN Number: 04-08-03														
08C070	Y Cedar R @ Logan St/Renton	WA-08-1140	5	A	20	12	5	9	21	11	10	10	1	10 Y Urban runoff.
08C110	Y Cedar R nr Landsburg	WA-08-1150	5	AA	15	3	6	3	5	8	2	2	0	4 N
** CPAN Number: 04-09-05														
ELB005	Y Elliott Bay near Harbor Is.	WA-09-0010	5	B	13	14	5	53	*	1	*	*	*	33 Y Urban runoff. Comb. sewer overflows. Organic tox may be a problem in sedi.
** CPAN Number: 04-09-06														
09A090	Y Green R @ 212th St nr Kent	WA-09-1020	5	A	37	19	11	5	26	19	14	11	1	16 Y Cattle (dairy, etc.). Urban runoff. Combined sewer overflows.
** CPAN Number: 04-09-07														
09A190	Y Green R @ Kanaskat	WA-09-1030	5	AA	40	9	8	6	5	6	6	7	0	4 N
		WA-09-1040												
** CPAN Number: 04-09-09														
09A060	Y Duwamish R @ Allentown Br	WA-09-1010	5	B	10	20	23	5	39	52	14	11	11	50 Y Naturally low oxygen. Renton STP (recently corrected). Combined sewer overflows. Organic tox may be a problem in sediments.
ELB010	Y Duwamish Waterway @ 16th St Br	WA-09-1010	5	B	20	20	16	6	64	*	10	*	*	47 Y Naturally low oxygen. Renton STP (recently corrected). Combined sewer overflows. Organic tox may be a problem in sediments.
** CPAN Number: 05-10-01														
CXB006	Y Commencement Bay mth City WH	WA-10-0020	5	B	15	15	5	42	*	2	*	*	*	26 Y Urban runoff. Combined sewer overflows. Tacoma STP (recently corrected). Organic tox may be a problem in sediments.
CXB010	Y Commencement-Puyallup R Mouth	WA-10-0020	5	B	14	14	4	4	55	*	8	*	*	35 Y Urban runoff. Combined sewer overflows. Tacoma STP (recently corrected). Organic tox may be a problem in sediments.
** CPAN Number: 05-10-02														
CXB003	Y Commencement Bay	WA-10-0010	5	A	14	14	6	23	*	2	*	*	*	12 Y Urban runoff. Combined sewer overflows. Agr. runoff. Tacoma STP (recently corrected). Organic tox may be a problem in sediments.
** CPAN Number: 05-10-03														
10A050	Y Puyallup R @ Puyallup (USGS)	WA-10-1020	3	A	7	8	4	38	14	25	25	0	32	Y Puyallup and Tacoma STP's (recently upgraded). White R. sources. Pulp mill (?)
10A070	Y Puyallup R @ Meridian St	WA-10-1020	5	A	15	8	8	3	34	13	25	25	0	28 Y Puyallup and Tacoma STP's (recently upgraded). White R. sources. Pulp mill (?)
10A110	Y Puyallup R @ Ortling	WA-10-1060	5	A	16	2	6	3	13	11	25	25	0	15 N White R. sources.
10C070	Y White R @ Sumner	WA-10-1030	5	A	30	13	9	5	36	10	24	22	0	26 Y Nonpoint agr. Cattle (dairy). Glacial fed. Flushing from Puget Power settling basins.
** CPAN Number: 05-12-07														
12A070	Y Chambers Cr nr Steilacoom		4	A	13	9	3	22	22	5	8	0	13	Septic tank seepage (sewered 1986).
** CPAN Number: 06-11-01														
11A070	Y Nisqually R @ Nisqually	WA-11-1010	5	A	20	10	7	4	10	11	19	16	0	10 N Glacial fed.
11A090	Y Nisqually R @ Powell Cr	WA-11-1020	5	A	30	6	7	5	9	8	22	16	0	10 N Glacial fed.
11A140	N Nisqually R @ Elbe	WA-11-1030	3	AA	25	0	6	4	8	13	23	23	1	16 N Glacial fed.
** CPAN Number: 06-11-02														
NSQ001	Y Nisqually Reach @ Nisqually R.	WA-PS-0080	5	AA	16	12	6	2	*	1	*	*	*	6 N
** CPAN Number: 06-13-03														
BUD002	Y Budd Inlet S End Oly Port Dock	WA-13-0030	5	B	17	25	6	36	*	4	*	*	*	27 Y Naturally low oxygen. Urban runoff. Boaters. Wood waste (?) Misc STP's.
** CPAN Number: 06-13-04														
13A060	Y Deschutes R @ E St Bridge	WA-13-1010	5	A	20	16	6	6	16	12	11	8	0	7 N
13A150	Y Deschutes R nr Rainier	WA-13-1020	5	A	20	10	9	7	17	11	9	4	0	7 N
** CPAN Number: 07-15-03														
DYB003	Y Dyes Inlet at Wash. Narrows	WA-15-0050	5	A	16	11	9	18	*	1	*	*	*	11 N
POD006	Y Liberty Bay at Virginia Point	WA-15-0030	5	A	19	10	10	6	*	3	*	*	*	9 Y
SIN001	Y Sinclair Inlet at Naval Shpyrd	WA-15-0040	5	A	18	10	11	16	*	2	*	*	*	12 Y

Table 1. Continued.

Station Number	Name	Water Body Tracking System	Yrs In	Seg. Anal Class	Seg. Size	Temp	Oxy	pH	Bact	Nitr	Turb	Sed	Susp	Ann	Over-	WOL	Comments																																
																		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
** CPAN Number: 08-02-01																																																	
BR0001	Y Haro Strait at Skipjack Island	WA-02-0010	5	AA	5	8	12	6	6	*	1	*	*	*	5	N																																	
SJ1001	Y San Juan Channel at Reid Rock	WA-02-0010	5	AA	5	7	14	6	9	*	2	*	*	5	N																																		
** CPAN Number: 09-17-01																																																	
PZ0005	Y Ft. Townsend Hbr near Malan Pt	WA-17-0020	5	A	5	9	11	9	4	*	2	*	*	6	N																																		
** CPAN Number: 09-18-06																																																	
18B080	Y Elwha R @ McDonald Br (USGS)	WA-18-2010	7	AA	7	6	10	20	3	6	7	4	1	8	N																																		
18B080	Y Elwha R @ McDonald Br (USGS)	WA-18-2020																																															
** CPAN Number: 09-18-07																																																	
PA0003	Y Ft. Angeles Hbr @ Ediz Hook Bt	WA-18-0020	5	A	5	6	15	6	14	*	1	*	*	9	N																																		
** CPAN Number: 09-20-11																																																	
Z0B070	N Boh R @ DNR Campground		7	AA	7	2	6	4	13	13	8	*	0	7																																			
** CPAN Number: 10-21-01																																																	
21A080	Y Queets R nr Clearwater (USGS)	WA-21-1010	7	AA	7	28	10	7	3	13	7	18	20	1	10	N																																	
21A080	Y Queets R nr Clearwater (USGS)	WA-21-1020																																															
** CPAN Number: 10-21-02																																																	
21B090	N Quinalt R @ Lake Quinalt	WA-21-2030	3	AA	3	17	9	10	5	8	7	*	0	7	N																																		
21B070	Y NF Quinalt R @ Amanda (USGS)	WA-21-2030	3	AA	3	1	6	6	2	6	1	2	2	3	N																																		
** CPAN Number: 10-22-03																																																	
GY5015	Y Grays Hbr nr N Whitcomb Flats	WA-22-0020	5	A	5	15	10	7	14	*	9	*	*	9	Y																																		
GY5016	Y Grays Harbor near Damon Point	WA-22-0020	5	A	5	14	11	11	7	*	8	*	*	8	Y																																		
** CPAN Number: 10-22-04																																																	
GY5004	Y Grays Hbr-Chehalis R @ Std O11	WA-22-0030	5	B	5	25	10	11	57	*	23	*	*	40	Y																																		
GY5006	N Grays Hbr at E End Rennie Is.	WA-22-0030	5	B	5	25	14	9	61	*	14	*	*	49	Y																																		
** CPAN Number: 10-22-05																																																	
22A070	Y Humpulips R nr Humpulips	WA-22-1010	5	A	5	28	14	7	4	10	7	21	17	0	10	N																																	
** CPAN Number: 10-22-09																																																	
22G070	Y Satsop R nr Satsop	WA-22-4050	5	A	5	30	10	7	4	11	9	18	21	0	12	N																																	
22G070	Y Satsop R nr Satsop	WA-22-4060																																															
22G070	Y Satsop R nr Satsop	WA-22-4070																																															
** CPAN Number: 10-22-12																																																	
22C050	Y Chehalis R nr Montesano	WA-22-4040	5	A	5	30	19	11	5	26	14	14	13	0	14	Y																																	
22C050	Y Chehalis R nr Montesano	WA-22-4010																																															
** CPAN Number: 10-22-24																																																	
GY5007	Y Grays Hbr N Chnl nr Rayonier	WA-22-0030	5	B	5	24	11	8	64	*	23	*	*	45	Y																																		
GY5008	Y Grays Hbr near Mid S. Channel	WA-22-0030	5	B	5	23	12	9	44	*	27	*	*	30	Y																																		
GY5009	Y Grays Hbr @ Moon Is. Reach	WA-22-0030	5	B	5	21	10	6	40	*	20	*	*	27	Y																																		
** CPAN Number: 10-23-13																																																	
23A120	Y Chehalis R @ Centralis	WA-23-1020	5	A	5	10	28	19	4	27	20	11	7	2	18	Y																																	
** CPAN Number: 10-23-15																																																	
23A160	Y Chehalis R @ Dryad	WA-23-1100	5	A	5	45	21	8	6	14	8	7	5	0	10	Y																																	
23A160	Y Chehalis R @ Dryad	WA-23-1110																																															
** CPAN Number: 10-23-18																																																	
23A070	Y Chehalis R @ Porter	WA-23-1010	5	A	5	33	21	12	5	23	20	11	6	0	14	Y																																	
** CPAN Number: 10-24-03																																																	
24B090	Y Willapa R nr Willapa	WA-24-2020	5	A	5	15	23	9	4	28	14	8	13	0	20	Y																																	
24B130	Y Willapa R @ Loban	WA-24-2030	5	A	5	15	13	11	5	47	16	11	11	0	27	Y																																	
** CPAN Number: 11-24-01																																																	
WF0003	Y Willapa R @ Johnson Slough	WA-24-0020	5	A	5	26	13	11	39	*	13	*	*	25	Y																																		
WF0004	Y Willapa Bay at Toke Point		5	A	5	17	10	12	10	*	9	*	*	9	Y																																		
** CPAN Number: 11-24-02																																																	
WF0001	Y Willapa River at Raymond	WA-24-2020	5	A	5	30	14	8	58	*	27	*	*	38	Y																																		

Misc small STP's. Septic tank seepage (?)

Cattle (dairy). Misc small STP's. Septic tank seepage (?)

Cattle (dairy). Misc small STP's. Septic tank seepage (?)

Raymond and South Bend STP's (recently corrected). Inadequate septic systems. Raw sewage. Low flows.

Table 1. Continued.

Station Number	Name	Meter Body Tracking System	Yes in Anal	Seg. Class	Seg. Size	Temp	Oxy	pH	Red	Nutr	Turb	Susp Amm			Over- all	WOL <sup>1</sup> (T)	Comments
												Sed	Sed	Tox			
** CPAN Number: 11-24-04																	
24F070	N Naselle R nr Naselle		3	A		15	8	3	20	5	1	*	0	9			
** CPAN Number: 12-26-04																	
26B070	Y Cowlitz R @ Kalao	WA-26-1010 WA-26-1040	5	A	20	8	7	3	16	16	25	25	0	16	N	Glacial fed. Volcanic and dredging activities.	
26B100	N Cowlitz R @ Castle Rock (USGS)		1	A		11	8	8	16	21	21	*	0	14		Volcanic and dredging activities. Little bank veg. Low flows (T)	
26B150	N Cowlitz R @ Toledo		3	A		4	5	6	9	7	9	*	0	5			
26D070	Y Toule R nr Castle Rock	WA-26-1050 WA-26-1060 WA-26-1070	5	A	55	27	11	4	21	16	25	25	0	27	Y	Volcanic and dredging activities. Little bank veg. Low flows (T)	
26E070	N Clippus R nr Komoos		7	AA	20	3	9	5	10	8	12	16	0	9			
** CPAN Number: 12-26-05																	
26C070	Y Cowman R @ Kalao	WA-26-1020	4	A		23	15	4	19	12	7	8	1	15	Y	Little bank veg. Shallow, bedrock substrate.	
** CPAN Number: 13-27-01																	
27C110	N Lewis R @ Ariel (USGS)	WA-27-2020	3	A	20	7	10	17	3	6	4	3	0	7			
27D090	Y EP Lewis R nr Dollar Corner	WA-27-2030	5	A	40	19	8	5	12	7	4	3	0	8	Y		
** CPAN Number: 13-27-02																	
27B070	Y Kalana R nr Kalana	WA-27-1010 WA-27-1020	5	A	45	11	7	5	10	7	6	4	0	5	N		
** CPAN Number: 14-29-02																	
29C070	N Wind R nr Carson		5	A	30	9	7	7	7	6	8	4	0	4			
** CPAN Number: 14-29-03																	
29B070	N White Salmon R nr Underwood		5	A	40	2	6	6	15	10	4	4	1	5			
** CPAN Number: 14-30-01																	
30B070	N Klitchkat R nr Pitt (USGS)		3	A	20	20	11	7	10	15	16	24	1	14		Structure-(?) Glacial fed trib. (6/11/88)	
** CPAN Number: 15-32-02																	
32A070	Y Walla Walla R nr Touchet	WA-32-1010	5	A	42	6	26	26	26	33	39	9	43	Y	Misc. small STP's. Agr. runoff. Little bank veg. Low summer flows.		
** CPAN Number: 15-32-03																	
32B070	Y Touchet R @ Touchet	WA-32-1020	5	A	50	43	8	21	21	18	35	41	8	35	Y	Little bank veg. Low summer flows. Agr. runoff.	
** CPAN Number: 16-34-01																	
34A070	Y Palouse R @ Hooper	WA-34-1010 WA-34-1030	5	B	120	27	14	32	22	30	46	38	8	49	Y	Low summer flows. Irrig. returns. Little bank veg. Agr. runoff. Cattle (feedlot). Dryland agr. Misc STP's.	
** CPAN Number: 16-34-02																	
34B110	Y SF Palouse R @ Pullman	WA-34-1020	5	A	30	24	7	28	74	100	41	19	16	100	Y	Moscow, ID STP. Agr. runoff. Little bank veg.	
** CPAN Number: 17-35-02																	
35B060	Y Tucannon R @ Powers	WA-35-2010	5	A	30	17	7	8	23	16	15	17	1	14	Y	Misc. small STP's. Cattle (open range).	
** CPAN Number: 17-35-03																	
35C070	N Grande Ronde R nr Anatone		7	A	45	28	15	14	22	17	31	9	3	22		Low flows. Little bank veg. Agr. runoff.	
** CPAN Number: 18-37-01																	
37A090	Y Yakima R @ Klona	WA-37-1010 WA-37-1020	5	A	80	31	9	15	19	30	12	21	4	36	Y	Irrigation returns. Misc STP's. Silviculture.	
** CPAN Number: 18-37-02																	
37A190	Y Yakima R @ Parker	WA-37-1040	5	A	40	12	8	4	23	20	7	17	0	15	Y	Agr. runoff/irrigation returns. Feedlots. Yakima STP. Silviculture.	
37A200	N Yakima R @ Abtaunum Cr (USGS)		7	A	21	8	12	39	23	9	27	9	7	35		Agr. runoff/irrigation returns. Feedlots. Yakima STP. Silviculture.	
** CPAN Number: 19-41-01																	
41A070	Y Crab Cr nr Beverly	WA-41-1010	5	B	30	25	19	17	21	27	22	38	5	45	N	Agr. runoff/irrigation returns.	
41A110	N Crab Cr nr Moses Lake		7	B	30	20	7	16	25	15	21	13	8	19		Agr runoff/irrigation return.	
** CPAN Number: 21-45-01																	
45A070	Y Wenatchee R @ Wenatchee	WA-45-1010	5	A	25	22	7	17	8	8	3	4	5	12	N	Irrigation returns. Silviculture.	
45A110	Y Wenatchee R nr Leavenworth	WA-45-1020	5	AA	30	16	9	4	1	5	2	4	1	6	N		
** CPAN Number: 21-46-02																	
46A070	Y Entiat R nr Entiat	WA-46-1010 WA-46-1020	5	A	40	17	7	13	7	7	2	6	2	8	N		



Table 1. Continued.

Station Number	Name	Water Body Tracking System	Yrs in Seg. Anal Class (mi)	Temp	Oxy	pH	Rect	Nutr	Turb	Sed	Sup Am	Over-	WOL <sup>1</sup>	Comments
			Seg. Size								For all	(?)		
** CPAN Number: 21-47-03 47A070	Y Chelan R @ Chelan	WA-47-9020	5 L	31	10	6	6	5	2	2	0	15	N	Elevated surface temperatures in lake. (Limit for 2000-2005)
** CPAN Number: 22-48-01 48A070	Y Methow R nr Pateros	WA-48-1010	5 A	25	18	8	10	6	8	5	11	1	10	N
48A130	Y Methow R nr Twisp	WA-48-1020	5 A	50	8	7	7	7	3	7	1	1	5	N
		WA-48-1040												
		WA-48-1050												
48A190	N Methow R b/w Gate Cr		3 AA	8	0	11	4	2	5	2	6	0	2	
48C070	Y Andrews Cr nr Mazama (USGS)		3 AA	0	6	2	4	6	1	2	0	2		
** CPAN Number: 22-49-02 49A070	Y Okanogan R @ Malott	WA-49-1010	5 A	255	27	15	10	16	6	9	17	1	18	Y Irrigation returns. Little bank veg (?)
49A090	Y Okanogan R @ Okanogan	WA-49-1020	5 A	50	27	14	8	15	5	9	19	1	19	Y Irrigation returns. Little bank veg (?)
49A190	Y Okanogan R @ Oroville	WA-49-1040	5 A	8	30	14	16	6	5	2	3	4	17	Y Irrigation returns. Little bank veg (?)
49B070	Y Similkameen R @ Oroville	WA-49-1030	5 A	27	20	9	9	4	7	15	2	14	N	Irrigation returns. Little bank veg (?)
** CPAN Number: 22-51-03 51A070	Y Nespelem R @ Nespelem	WA-51-1010	5 A	30	10	8	8	15	11	7	5	1	7	N
** CPAN Number: 23-52-03 52A070	Y Sanpoil R @ Keller	WA-52-1010	5 A	65	18	9	12	10	6	17	15	1	9	N
** CPAN Number: 23-59-02 59A070	Y Colville R @ Kettle Falls	WA-59-1010	5 A	20	13	11	28	18	22	13	4	19	Y	Silviculture. Upstream impoundment. Agr. runoff. Misc small STP's.
** CPAN Number: 23-60-04 60A070	Y Kettle R nr Baratow	WA-60-1010	5 A	28	18	9	10	8	5	11	7	0	10	N
** CPAN Number: 23-62-05 62A080	Y Pend Oreille R @ Border (USGS)	WA-62-1010	3 A	44	26	16	14	5	8	1	7	9	15	N Upstream impoundments.
** CPAN Number: 24-54-01 54A070	Y Spokane R @ Long Lake (USGS)	WA-54-1010	3 A	33	19	16	8	9	13	16	5	5	7	N
54A120	Y Spokane R @ Riverside State Pt	WA-54-1020	5 A	18	17	8	11	11	17	10	4	11	10	Y
** CPAN Number: 24-55-02 55B070	Y Little Spokane R nr Mouth	WA-55-1010	5 A	30	12	10	12	13	13	10	6	1	8	Y
** CPAN Number: 24-56-03 56A070	Y Hangman Cr @ Mouth	WA-56-1010	5 A	50	29	6	30	19	25	38	19	16	32	Y Low summer flows. Agr. runoff. Sewage systems (?).
** CPAN Number: 24-57-04 57A190	Y Spokane R nr Post Falls	WA-57-1010	5 A	23	30	17	5	6	5	3	2	0	16	Y Low summer flows. Metals tox. from Kellogg mining district historical problem.
** CPAN Number: 25-00-01 ADM001	Y Admiralty Inlet S Whidbey Is	WA-PS-0120	5 AA	9	14	6	0	*	1	*	*	*	5	N
FOD005	Y Port Orchard at Brownsville	WA-15-0030	5 AA	17	10	9	2	*	1	*	*	*	8	Y
PSB003	Y Puget Sound at West Point	WA-PS-0050	5 AA	12	14	6	26	*	1	*	*	*	14	N West Point STP.
** CPAN Number: 25-00-02 BUD005	Y Budd Inlet-Oly Shoal at Horn	WA-13-0020	5 A	18	10	10	21	*	2	*	*	*	10	Y Boatere. Hood waste (?) Misc STP's.
CRB001	Y Carr Inlet off Green Point	WA-15-0060	5 AA	16	12	8	0	*	1	*	*	*	7	N
DMAG001	Y Dana Passage near Brisco Point	WA-PS-0090	1 AA	17	12	8	0	*	1	*	*	*	6	Y
ELD001	Y Eld Inlet near Flapjack Point	WA-14-0020	5 AA	18	9	9	12	*	2	*	*	*	6	N
NRB001	Y Tacoma Narrows nr Pt Defiance	WA-PS-0060	5 AA	12	15	4	4	*	1	*	*	*	6	N
NSQ002	Y Nequally Beach nr Devil's Bl	WA-PS-0070	1 AA	13	10	4	0	*	1	*	*	*	14	Y Shallow water.
OAK004	Y Oakland Bay nr Eagle Point	WA-14-0040	5 A	24	10	9	17	*	4	*	*	*	8	N
PCK001	Y Pickingog Pag nr Harstene Is.	WA-14-0010	5 A	9	7	5	2	*	2	*	*	*	10	N
TOT001	Y Totten Inlet near Windy Point	WA-14-0030	5 A	20	9	11	13	*	2	*	*	*	12	N Naturally low oxygen.
** CPAN Number: 25-00-03 HCB002	Y Hood Canal at Puleli Point	WA-17-0010	5 AA	15	24	8	1	*	1	*	*	*	7	N
HCB006	Y Hood Canal near King Spit	WA-PS-0100	5 AA	12	18	7	2	*	1	*	*	*	16	N Naturally low oxygen.
** CPAN Number: 25-00-04 HCB003	Y Hood Canal at Eldon	WA-PS-0110	5 AA	13	31	8	4	*	1	*	*	*	30	N Naturally low oxygen.
HCB004	Y Hood Canal at Sisters Point	WA-PS-0110	5 AA	14	49	8	5	*	2	*	*	*	7	N Naturally low oxygen.
** CPAN Number: 25-16-99 16A070	Y Shokomish R nr Potlatch	WA-16-1010	4 AA	1	8	5	8	8	16	14	1	7	N	

Table 1. Continued.

Station Number	Name	Water Body Tracking System	Ips In	Seg. Anal Class	Seg. Size (ml)	Temp	Oxy pH	Bact	Nutr	Turb	Susp Amm Over- WQL <sup>1</sup>			Comments		
											Sed	Tox	all (1)			
** CPAN Number: 26-00-01																
25A075	N Columbia R @ Bradwood		7	A	24	12	9	34	16	*	22	2	2	24	Summer slack water condition. Cumulative point and nonpoint sources.	
28A165	N Columbia R @ Warendale		7	A	26	11	7	5	13	10	15	4	14			
** CPAN Number: 26-00-02																
31A070	N Columbia R @ Umatilla		7	A	24	12	9	22	14	*	11	4	15	15	Irrigation returns (Yakima and Snake). Upstream impoundments.	
** CPAN Number: 26-00-03																
36A065	N Columbia R @ Richland		1	A	17	8	20	6	8	3	6	1	9	9	Upstream impoundment.	
36A070	Y Columbia R nr Vernita		5	A	150	20	8	11	1	8	3	2	7	7		
44A070	Y Columbia R blw Rock Is Dam	WA-CR-1040 WA-CR-1050	5	A	190	20	9	5	15	8	4	10	0	10	10	Summer slack water condition.
** CPAN Number: 26-00-04																
53A070	Y Columbia R @ Grand Coulee		5	A	190	19	12	4	2	7	3	2	0	8		
61A070	Y Columbia R @ Northport (USGS)		3	AA	17	13	8	10	13	11	2	7	4	7		
** CPAN Number: 26-00-05																
33A050	Y Snake R @ Burbank	WA-33-1030	5	A	70	27	17	11	4	20	12	4	4	16	Y	Summer slack water condition.
35A100	N Snake R blw Lar Granite Dam		7	A	14	9	6	13	15	5	11	2	8	8	Idaho sources. Grande Ronde agr.	
35A200	N Snake R nr Anatone		7	A	30	11	10	12	22	14	17	1	19	19		
** CPAN Number: 26-62-99																
62A150	Y Pend Oreille R @ Newport	WA-62-1020	5	A	44	22	11	12	1	3	3	3	2	11	N	
** CPAN Number: 27-00-01																
PAH008	Y Port Angeles Rbr @ Morse Cr.	WA-18-0010	5	AA	6	17	6	23	*	2	*	*	13	N	Upstream recreational development (inadequate septic systems).	

<sup>1</sup> Designated as water quality limited in the 1988 305(b) report.

<sup>2</sup> Y indicates current station; N indicates historic station.

Table 2. 1988 water quality index analysis sorted by Department of Ecology region.

Station CPAN Number	Station Name	Seg. Class	Seg. Size WQI	Yrs Anal	Temp	Oxy	pH	Paet	Nutr	Turb	Sed	Sup	Amo	Over-	WQI	Comments and Possible Sources of WQI's Greater than 20
			(mi)										Box	all	(?)	
** Ecology Region: C																
30B070	N 14-30-01 Kllickit R nr Pitt (USGS)	A	20	3	20	11	7	10	15	16	24	1	14			-Glaciale Fed (C/14/98) Irrigation returns (Yakima and Snake). Upstream impoundments.
31A070	N 26-00-02 Columbia R @ Uastilla	A	80	5	24	12	9	22	14	*	11	4	15			Y Irrigation returns. Mac STP's. Silviculture.
37A090	Y 18-37-01 Yakima R @ Klona	A	40	5	31	9	15	19	30	12	11	4	36			Y Agr. runoff/irrigation returns. Feedlots. Yakima STP. Silviculture.
37A190	Y 18-37-02 Yakima R @ Park	A	40	5	21	8	12	39	23	9	17	0	35			Y Agr. runoff/irrigation returns. Feedlots. Yakima STP. Silviculture.
37A200	N 18-37-02 Yakima R @v Atkanan Cr (USGS)	A	190	5	21	9	15	15	8	4	10	0	10			Summer slack water condition. Silviculture.
44A070	Y 26-00-03 Columbia R @v Rock Is Dam	A	25	5	22	9	17	8	3	4	5	1	16			Irrigation returns. Silviculture.
45A070	Y 21-45-01 Wenatchee R @ Wenatchee	A	20	5	16	9	13	7	7	2	6	2	2			Elevated surface temperatures in lake.
45A110	Y 21-45-01 Entiat R nr Leavenworth	AA	40	5	31	10	6	6	5	2	2	0	15			
46A070	Y 21-46-02 Entiat R nr Entiat	L	25	5	18	8	10	6	8	5	11	1	10			
47A070	Y 21-47-03 Chelan R @ Chelan	A	25	5	18	8	10	6	7	7	7	1	5			
48A070	Y 22-48-01 Methow R nr Pateros	A	50	5	27	15	10	16	6	9	17	1	18			Irrigation returns. Little bank veg (?)
48A130	Y 22-48-01 Methow R nr Twisp	AA	8	3	0	11	4	2	4	2	6	0	2			Irrigation returns. Little bank veg (?)
48A190	N 22-48-01 Andrews Cr nr Mazama (USGS)	AA	255	5	27	15	10	16	6	9	17	1	18			Irrigation returns. Little bank veg (?)
49A070	Y 22-49-02 Okanogan R @ Malott	A	50	5	27	14	8	15	5	9	19	1	19			Irrigation returns. Little bank veg (?)
49A090	Y 22-49-02 Okanogan R @ Okanogan	A	8	5	30	14	16	6	5	2	3	4	17			Irrigation returns. Little bank veg (?)
49A190	Y 22-49-02 Okanogan R @ Oroville	A	27	5	20	9	9	9	4	7	15	2	14			Irrigation returns. Little bank veg (?)
49B070	Y 22-49-02 Similkameen R @ Oroville	A	30	5	10	8	8	15	11	7	5	1	7			
51A070	Y 22-51-03 Nespelem R @ Nespelem	A	190	5	19	12	4	2	7	3	2	0	8			
53A070	Y 26-00-04 Columbia R @ Grand Coulee	A														
** Ecology Region: E																
32A070	Y 15-32-02 Walls Walla R nr Touchet	A	5	42	6	26	26	26	26	33	39	9	43			Misc. small STP's. Agr. runoff. Little bank veg. Low summer flows.
32B070	Y 15-32-03 Touchet R @ Touchet	A	50	5	43	8	21	21	18	35	41	8	35			Little bank veg. Low summer flows. Agr. runoff.
33A050	Y 26-00-05 Snake R @ Burbank	A	70	5	27	17	11	4	20	12	4	4	16			Summer slack water condition.
34A070	Y 16-34-01 Palouse R @ Hooper	B	120	5	27	14	32	22	30	46	38	8	49			Low summer flows. Irrig. returns. Little bank veg. Agr. runoff. Cattle (feedlot). Dryland agr. Mac STP's.
34B110	Y 16-34-02 SF Palouse R @ Pullman	A	30	5	24	7	28	74	100	41	19	16	100			Moose, ID STP. Agr. runoff. Little bank veg.
35A100	N 26-00-05 Snake R @v Lew Granite Dam	A	7	14	9	6	13	15	5	11	2	8				
35A200	N 26-00-05 Snake R @v Lew Granite Dam	A	7	30	11	10	22	14	17	1	19	1	19			Idaho sources. Grande Ronde agr.
35B060	Y 17-35-02 Tucannon R @ Powers	A	30	5	17	7	8	23	16	15	17	1	14			Misc. small STP's. Cattle (open range).
35C070	N 17-35-03 Grande Ronde R @ Richland	A	45	1	28	15	24	22	17	31	9	3	22			Low flows. Little bank veg. Agr. runoff.
36A065	N 26-00-03 Columbia R @v Anacostone	A	150	1	17	8	20	6	8	3	6	1	9			Upstream impoundment.
36A070	Y 26-00-03 Columbia R @v Vernita	A	30	5	25	19	17	21	27	22	38	5	45			Agr. runoff/irrigation returns.
43A070	N 19-41-01 Crab Cr nr Beverly	B	30	5	20	7	16	25	15	13	8	19	19			Agr runoff/irrigation return.
43A110	N 19-41-01 Crab Cr nr Moses Lake	A	65	5	18	9	12	10	6	17	15	1	9			
52A070	Y 23-52-03 Samoil R @ Keller	A	33	3	19	16	8	9	13	16	5	5	7			
54A070	Y 24-54-01 Spokane R @ Long Lake (USGS)	A	18	5	17	8	11	11	17	10	4	11	10			
54A170	Y 24-54-01 Spokane R @ Riverside State Pk	A	30	5	12	10	12	13	13	10	6	1	8			Low summer flows. Agr. runoff. Sewage systems (?).
55B070	Y 24-55-02 Little Spokane R nr Mouth	A	30	5	29	6	30	19	25	38	19	16	32			Low summer flows. Metals tox. from Kellogg mining district historical problem.
56A070	Y 24-56-03 Hangman Cr @ Mouth	A	23	5	30	17	5	6	5	2	0	16	16			Low summer flows. Metals tox. from Kellogg mining district historical problem.
57A190	Y 24-57-04 Spokane R nr Post Falls	A	23	5	20	13	11	28	18	22	13	4	19			Silviculture. Upstream impoundment. Agr. runoff. Misc small STP's.
59A070	Y 23-59-02 Colville R @ Kettle Falls	A	28	5	18	9	10	8	5	11	7	0	10			Nonpoint agr. runoff and dairy wastes. Glacial fed.
60A070	Y 23-60-04 Kettle R nr Marston	A	17	3	13	8	10	13	11	2	7	4	7			Glacial fed. Agr. runoff.
61A070	Y 26-00-04 Columbia R @ Northport (USGS)	AA	44	3	26	16	14	5	8	1	7	9	15			Upstream impoundments.
62A080	Y 23-62-05 Pend Oreille R @ Bocard (USGS)	A	44	3	23	16	14	5	8	1	7	9	15			
62A150	Y 26-62-99 Pend Oreille R @ Newport	A	44	5	22	11	12	1	3	3	3	2	11			
** Ecology Region: N																
01A050	Y 01-01-04 Mookseck R @ Brennan	A	25	5	11	7	4	28	12	21	21	20	0			Nonpoint agr. runoff and dairy wastes. Glacial fed.
01A110	Y 01-01-04 Mookseck R @ No Cedarville	A	12	5	13	14	4	49	30	13	8	4	36			
01B070	Y 01-01-06 Sumas R nr Buntington BC	A	11	5	6	7	3	14	6	18	12	0	7			
03A060	Y 02-03-06 Skagit R nr Mount Vernon	A	40	5	8	7	4	31	10	20	12	0	16			Cattle (dairy). Septic tank failures (?).
03B050	Y 02-03-10 Samish R nr Burlington	AA	25	5	4	5	4	5	5	8	0	4	4			
04A060	Y 02-04-07 Skagit R @ Concrete	AA	30	5	1	5	4	4	5	3	5	0	3			
04A100	Y 02-04-07 Skagit R @ Marblecunt	AA	1	5	6	7	4	3	6	7	4	0	4			
04B070	Y 02-04-07 Babar R @ Concrete	AA	1	3	*	*	*	*	*	*	*	*	*			Insuf. data. Summer samples only.
04B150	Y 02-04-07 Babar Lake @ Boulder Cr	AA	40	1	3	6	4	6	5	12	23	0	10			Glacial fed.
04C070	Y 02-04-07 Sunk R nr Northport	AA	18	5	13	10	5	30	8	29	13	0	17			Nonpoint agr. sources. Upstream landslides (Deer Cr).
05A070	Y 03-05-02 Stillaguamish R nr Silvana	AA	16	5	11	9	4	22	8	24	0	14	14			Nonpoint agr. sources. Soil erosion.
05A090	Y 03-05-05 SF Stillaguamish @ Arlington	A	31	5	6	7	4	13	9	36	32	0	21			Upstream landslide (Deer Cr).
05B070	Y 03-05-03 SF Stillaguamish @ Cicero	A	15	5	17	8	7	28	9	8	6	0	13			Agr. runoff. Cattle (dairy, etc).
07A090	Y 03-07-10 Snohomish R @ Snohomish	A	15	5	17	8	7	28	9	8	6	0	12			
07A111	Y 03-07-10 Snohomish R nr Monroe (USGS)	A	11	5	13	9	29	26	8	2	4	0	22			

Table 2. Continued.

Station Number	CPAN Number	Station Name	Seg. Class	Seg. Size (mi)	Yrs in WQI Anal	Temp	Oxy	pH	Ract	Nutr	Turb	Sed	Tox	All	Over-	WQI	Comments and Possible Sources of WQI's Greater than 20	
																	WQI	(?)
07B055	Y 03-07-19	Pilchuck R @ Snohomish	A	35	5	20	8	7	16	9	7	9	0	12	Y	12	Low summer flows.	
07C070	Y 03-07-11	Skykomish R @ Monroe	A	21	5	13	7	8	6	5	3	3	0	5	N	5		
07C130	Y 03-07-12	Skykomish R nr Cold Bar	AA	34	5	9	8	9	6	7	6	4	0	4	N	4		
07D070	Y 03-07-13	Snoqualmie R nr Carnation	A	20	5	12	7	8	12	6	4	0	0	6	Y	6	Septic tank seepage. Turf farms runoff.	
07D130	Y 03-07-13	Snoqualmie R @ Snoqualmie	A	25	5	7	8	5	8	6	4	0	0	29	Y	29	Originates in shallow lake. Septic tank seepage. Turf farms runoff.	
08B070	Y 04-08-02	Sammish R @ Rockwell	A	15	5	20	14	6	41	22	11	10	1	10	Y	10	Urban runoff.	
08C070	Y 04-08-03	Cedar R @ Logan St/Renton	A	20	5	12	5	9	21	11	10	10	1	10	Y	10	Naturally low oxygen. Renton STP (recently corrected). Combined sewer overflows. Organic tox may be a problem in sediments.	
08C110	Y 04-08-03	Cedar R nr Landsburg	AA	15	5	3	6	3	5	8	2	2	0	4	Y	4	Cattle (dairy, etc.). Urban runoff. Combined sewer overflows.	
09A060	Y 04-09-09	Duwamish R @ Allentown Br	B	10	5	20	23	5	39	52	14	11	11	50	Y	50		
09A190	Y 04-09-06	Green R @ 212th St nr Kent	A	37	5	19	11	5	26	19	14	11	1	16	Y	16		
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	9	8	6	5	6	6	7	0	4	N	4		
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	9	14	6	0	1	1	1	0	5	N	5		
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	9	14	6	0	1	1	1	0	5	N	5		
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	15	12	11	35	3	3	3	0	20	Y	20	Georgia Pacific Corp. pulp mill. Urban runoff.	
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	11	14	10	21	3	3	3	0	6	Y	6		
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	12	10	11	17	3	3	3	0	8	Y	8		
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	11	11	9	2	2	2	2	0	13	N	13	Industrial sewage and waste (fish processing) (recently corrected).	
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	17	9	13	25	2	2	2	0	11	N	11	Urban runoff. Combined sewer overflows. Organic tox may be a problem in sediments.	
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	16	11	9	18	3	3	3	0	33	Y	33	Naturally low oxygen. Renton STP (recently corrected). Combined sewer overflows. Organic tox may be a problem in sediments.	
09A190	Y 04-09-07	Green R @ Kent	AA	40	5	13	14	5	53	1	1	1	0	47	Y	47	Naturally low oxygen.	
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	20	16	6	64	10	10	10	0	12	N	12		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	15	24	8	1	1	1	1	0	10	N	10		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	12	18	7	2	2	2	2	0	7	N	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	11	20	9	1	1	1	1	0	5	N	5		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	8	12	6	6	6	6	6	0	8	Y	8		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	12	15	10	9	2	2	2	0	8	Y	8		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	17	10	10	6	3	3	3	0	14	N	14	West Point STP.	
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	12	14	6	26	2	2	2	0	46	Y	46	Comb. sewer overflows. Meyerhauser & Scott Paper pulp mills. Urban runoff.	
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	15	19	6	63	2	2	2	0	47	Y	47	Comb. sewer overflows. Meyerhauser & Scott Paper pulp mills. Urban runoff.	
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	24	14	12	13	2	2	2	0	44	Y	44	Comb. sewer overflows. Meyerhauser & Scott Paper pulp mills. Urban runoff.	
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	12	15	9	13	2	2	2	0	44	Y	44	Comb. sewer overflows. Meyerhauser & Scott Paper pulp mills. Urban runoff.	
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	24	17	10	52	5	5	5	0	44	Y	44	Comb. sewer overflows. Meyerhauser & Scott Paper pulp mills. Urban runoff.	
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	9	11	9	4	2	2	2	0	6	N	6		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	11	15	9	2	2	2	2	0	12	Y	12		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	18	10	11	16	2	2	2	0	5	N	5		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	7	14	6	9	3	3	3	0	6	Y	6		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	9	14	5	6	6	6	6	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12	9	12	3	3	3	0	7	Y	7		
09A190	Y 04-09-09	Duwamish Waterway @ 16th St nr B	B	5	5	14	12											

Table 2. Continued.

Station CPAN Number	Station Name	Seg. Class	Seg. in Size (mi)	Yrs Anal	Temp	Oxy	pH	Bact	Nutr	Turb	Susp	Ammo	Over-MLL <sup>1</sup>	Comments and Possible Sources of WQI's Greater than 20	
23A160	Y 10-23-15 Chehalis R @ Dryad	A	45	5	21	8	6	14	8	7	5	0	10	Y	Low flows. Slack water condition.
24B090	Y 10-24-03 Willapa R nr Willapa	A	15	5	23	9	4	28	14	8	13	0	20	Y	Septic tank seepage. Raw sewage. Agr. runoff. Low flow.
24B130	Y 10-24-03 Willapa R @ Laban	A	15	5	13	11	5	47	16	11	11	0	27	Y	Cattle (dairy).
24F070	N 11-24-04 Naselle R nr Naselle	A	7	24	15	8	3	20	5	1	*	0	24	N	Summer slack water condition. Cumulative point and nonpoint sources.
25A075	N 26-00-01 Columbia R @ Bradwood	A	20	5	24	12	9	34	16	22	2	2	16	N	Glacial fed. Volcanic and dredging activities.
26B070	Y 12-26-04 Cowitz R @ Kelso	A	5	28	7	8	3	16	16	25	0	0	14	N	Volcanic and dredging activities. Little bank veg.
26B100	N 12-26-04 Cowitz R @ Castle Rock (USGS)	A	3	1	11	8	6	16	21	21	*	0	15	Y	Little bank veg. Shallow, bedrock substrate.
26B150	N 12-26-04 Cowitz R @ Toledo	A	3	4	5	6	9	7	9	7	8	1	15	Y	Volcanic and dredging activities. Little bank veg.
26C070	Y 12-26-05 Cowan R @ Kalen	A	55	5	23	15	4	19	12	25	25	0	27	Y	
26D070	Y 12-26-04 Toutle R nr Castle Rock	AA	20	7	3	9	5	10	8	12	16	0	5	N	
26E070	N 12-26-04 Clisp R nr Kosmos	AA	45	5	11	7	5	10	7	6	4	0	5	N	
27B070	Y 13-27-02 Kalama R nr Kalama	A	20	3	7	10	17	3	6	4	3	0	8	N	
27C110	N 13-27-01 Lewis R @ Ardel (USGS)	A	40	5	19	8	5	12	7	4	3	0	8	N	
27D090	Y 13-27-01 KF Lewis R nr Dollar Corner	A	40	7	26	11	7	5	13	10	15	4	14	Y	
28A165	N 26-00-01 Columbia R @ Warrendale	A	40	5	2	6	6	15	10	4	4	1	5	Y	Naturally low oxygen. Urban runoff. Boaters. Wood waste (?) Misc STP's.
29B070	N 14-29-03 Maika Salmon R nr Underwood	A	30	5	9	7	6	8	4	4	0	4	27	Y	Boaters. Wood waste (?) Misc STP's.
29C070	N 14-29-02 Wind R nr Carson	A	30	5	17	25	6	36	*	4	*	*	10	Y	Urban runoff. Combined sewer overflows. Agr. runoff. Tacoma STP (recently corrected).
BUD002	Y 06-13-02 Budd Inlet S End Oly Port Dock	B	5	18	10	10	21	*	2	*	*	*	12	Y	Urban runoff. Organic tox may be a problem in sediments.
BUD005	Y 23-00-02 Budd Inlet-Oly Shoal at Horn	A	5	14	14	6	23	*	2	*	*	*	26	Y	Urban runoff. Combined sewer overflows. Tacoma STP (recently corrected).
CMB003	Y 05-10-02 Commencement Bay	A	5	5	15	15	5	42	*	2	*	*	35	Y	Organic tox may be a problem in sediments.
CMB006	Y 05-10-01 Commencement Bay with City WW	B	5	14	14	4	55	*	8	*	*	*	7	N	
CMB010	Y 05-10-01 Commencement-Puyallup R Mouth	B	5	16	12	8	0	*	1	*	*	*	7	N	
CRR001	Y 25-00-02 Carr Inlet off Green Point	AA	5	17	12	8	0	*	1	*	*	*	6	Y	Weyerhaeuser and ITI mills. Aberdeen and Hoquiam combined sewer overflows.
CSE001	Y 25-00-02 Case Inlet off S. Barron Is	AA	1	13	10	4	0	*	2	*	*	*	8	Y	Shoreline erosion. Shallow.
EWB001	Y 25-00-02 Dana Passage near Ericso Point	AA	5	18	9	9	12	*	2	*	*	*	40	Y	Weyerhaeuser and ITI mills. Aberdeen and Hoquiam combined sewer overflows.
ELM001	Y 25-00-02 Eld Inlet near Flapjack Point	A	5	25	10	11	57	*	23	*	*	*	49	Y	Shoreline erosion. Shallow.
GYS004	Y 10-22-04 Grays Ebr-Chahalis R @ Std Off	B	5	25	14	9	61	*	14	*	*	*	45	Y	Weyerhaeuser and ITI mills. Aberdeen and Hoquiam combined sewer overflows.
GYS006	N 10-22-04 Grays Ebr at E End Remmie Is.	B	5	24	11	8	64	*	23	*	*	*	30	Y	Shoreline erosion. Shallow.
GYS007	Y 10-22-24 Grays Ebr N Chmi nr Rayconier	B	5	23	12	9	44	*	27	*	*	*	27	Y	Weyerhaeuser and ITI mills. Aberdeen and Hoquiam combined sewer overflows.
GYS008	Y 10-22-24 Grays Ebr near Mid S. Channel	B	5	21	10	6	40	*	20	*	*	*	27	Y	Shoreline erosion. Shallow.
GYS009	Y 10-22-24 Grays Ebr @ Moon Is. Reach	B	5	15	10	7	14	*	9	*	*	*	9	Y	Naturally low oxygen.
GYS015	Y 10-22-03 Grays Ebr nr N Whitcomb Flats	A	5	14	11	11	7	*	8	*	*	*	16	N	Naturally low oxygen.
GYS016	Y 10-22-03 Grays Harbor near Damon Point	AA	5	13	31	8	4	*	1	*	*	*	30	N	Naturally low oxygen.
HCB003	Y 25-00-04 Hood Canal at Eldon	AA	5	14	49	8	5	*	2	*	*	*	6	N	
HCB004	Y 25-00-04 Hood Canal at Sifers Point	AA	5	12	15	4	4	*	1	*	*	*	6	N	
HRR001	Y 25-00-02 Tacoma Narrows nr Pt. DeGance	AA	5	16	12	6	2	*	1	*	*	*	6	N	
MSQ001	Y 06-11-02 Misqually Reach @ Misqually R.	AA	1	13	10	4	0	*	1	*	*	*	14	Y	Shallow water.
MSQ002	Y 25-00-02 Misqually Reach nr Devil's Hd	AA	5	24	10	9	17	*	4	*	*	*	9	N	Upstream recreational development (Inadequate septic systems).
OAK004	Y 25-00-02 Oakland Bay nr Eagle Point	AA	5	6	15	6	14	*	1	*	*	*	13	N	
PAB003	Y 09-18-07 Port Angeles Ebr @ Ediz Hook Rd	AA	5	6	17	6	23	*	2	*	*	*	10	N	Raymond and South Bend STP's (recently corrected). Inadequate septic systems.
PAB008	Y 25-00-02 Port Angeles Ebr @ Morse Creek	AA	5	9	7	5	2	*	2	*	*	*	38	Y	Raymond and South Bend STP's (recently corrected). Low flow.
PCK001	Y 25-00-02 Pickinging Pag nr Haratona Is.	A	5	20	9	11	13	*	2	*	*	*	25	Y	Raymond and South Bend STP's (recently corrected). Inadequate septic systems.
TOD001	Y 25-00-02 Totten Inlet near Windy Point	A	5	30	14	8	58	*	27	*	*	*	9	Y	Raymond and South Bend STP's (recently corrected). Low flows.
WPA001	Y 11-24-02 Willapa River at Raymond	A	5	26	13	11	39	*	13	*	*	*	25	Y	
WPA003	Y 11-24-01 Willapa River @ Johnson Slough	A	5	17	10	12	10	*	9	*	*	*	9	Y	
WPA004	Y 11-24-01 Willapa Bay at Toke Point	A	5	17	10	12	10	*	9	*	*	*	9	Y	

<sup>1</sup> Designated as water quality limited in the 1988 305(b) report.  
 2 C = Central Region; E = Eastern Region; N = Northwest Region; and S = Southeast Region.  
 3 Y indicates current station; N indicates historic station.

Table 3. The ten stations receiving the highest Water Quality Index for each variable. Stations with indices under 20 are not included. No station had an ammonia toxicity value over 20.

Station Number	Current? <sup>a</sup>	Station Name	Ecology Region	Class	Eco Region	WQI
<b>TEMPERATURE</b>						
32B070	Y	Touchet R @ Touchet	E	A	7	43
32A070	Y	Walla Walla R nr Touchet	E	A	7	42
47A070	Y	Chelan R @ Chelan	C	L	7	31
37A090	Y	Yakima R @ Kiona	C	A	7	31
WPA001	Y	Willapa River @ Raymond	S	A		30
57A190	Y	Spokane R nr Post Falls	E	A	7	30
49A190	Y	Okanogan R @ Oroville	C	A	7	30
35A200	N	Snake R nr Anatone	E	A	9	30
56A070	Y	Hangman Cr @ Mouth	E	A	7	29
23A120	Y	Chehalis R @ Centralia	S	A	2	28
35C070	N	Grande Ronde R nr Anatone	E	A	9	28
<b>OXYGEN</b>						
HCB004	Y	Hood Canal @ Sisters Point	S	AA		49
HCB003	Y	Hood Canal @ Eldon	S	AA		31
BUD002	Y	Budd Inlet S End Oly Port Dock S	B			25
HCB002	Y	Hood Canal @ Pulali Point	N	AA		24
09A060	Y	Duwamish R @ Allentown Br	N	B	2	23
HLM001	Y	Holmes Harbor @ Honeymoon Bay N	A			20
<b>pH</b>						
34A070	Y	Palouse R @ Hooper	E	B	7	32
56A070	Y	Hangman Cr @ Mouth	E	A	7	30
07A111	Y	Snohomish R nr Monroe (USGS)	N	A	2	29
34B110	Y	SF Palouse R @ Pullman	E	A	7	28
32A070	Y	Walla Walla R nr Touchet	E	A	7	26
32B070	Y	Touchet R @ Touchet	E	A	7	21
36A065	N	Columbia R @ Richland	E	A	7	20
18B090	Y	Elwha R @ McDonald Br (USGS)	S	AA	1	20
<b>BACTERIA</b>						
34B110	Y	SF Palouse R @ Pullman	E	A	7	74
ELB010	Y	Duwamish Waterway @ 16th St Br	N	B		64
GYS007	Y	Grays Hbr N Chnl nr Rayonier	S	B		64
PSS008	Y	Pt Gardner Bay @ Pier 3	N	B		63
PSS015	Y	Snohomish R @ Highway 99 Brdg	N	A		62
GYS006	N	Grays Hbr @ E End Rennie Is.	S	A		61
WPA001	Y	Willapa River @ Raymond	S	A		58
GYS004	Y	Grays Hbr-Chehalis R @ Std Oil	S	B		57
CMB010	Y	Commencement-Puyallup R Mouth	N	B		55
ELB005	Y	Elliott Bay near Harbor Island	N	B		53

<sup>a</sup>"Y" refers to current stations; "N" to historic stations.

Table 3. (Continued).

Station Number	Current? <sup>a</sup>	Station Name	Ecology Region	Class	Eco Region	WQI
NUTRIENTS						
34B110	Y	SF Palouse R @ Pullman	E	A	7	100
09A060	Y	Duwamish R @ Allentown Br	N	B	2	52
34A070	Y	Palouse R @ Hooper	E	B	7	30
01D070	Y	Sumas R nr Huntingdon BC	N	A	2	30
37A090	Y	Yakima R @ Kiona	C	A	7	30
41A070	Y	Crab Cr nr Beverly	E	B	7	27
32A070	Y	Walla Walla R nr Touchet	E	A	7	26
56A070	Y	Hangman Cr @ Mouth	E	A	7	25
37A200	N	Yakima R abv Ahtanum Cr (USGS)	C	A	7	23
35A200	N	Snake R nr Anatone	E	A	9	22
08B070	Y	Sammamish R @ Bothell	N	A	2	22
12A070	Y	Chambers Cr nr Steilacoom	S	A	2	22
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TURBIDITY						
34A070	Y	Palouse R @ Hooper	E	B	7	46
34B110	Y	SF Palouse R @ Pullman	E	A	7	41
56A070	Y	Hangman Cr @ Mouth	E	A	7	38
05B070	Y	NF Stillaguamish @ Cicero	N	A	2	36
32B070	Y	Touchet R @ Touchet	E	A	7	35
32A070	Y	Walla Walla R nr Touchet	E	A	7	33
35C070	N	Grande Ronde R nr Anatone	E	A	9	31
05A070	Y	Stillaguamish R nr Silvana	N	A	2	29
GYS008	Y	Grays Hbr near Mid S. Channel	S	B		27
WPA001	Y	Willapa River @ Raymond	S	A		27
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SUSPENDED SEDIMENT						
32B070	Y	Touchet R @ Touchet	E	A	7	41
32A070	Y	Walla Walla R nr Touchet	E	A	7	39
34A070	Y	Palouse R @ Hooper	E	B	7	38
41A070	Y	Crab Cr nr Beverly	E	B	7	38
05B070	Y	NF Stillaguamish @ Cicero	N	A	2	32
37A200	N	Yakima R abv Ahtanum Cr (USGS)	C	A	7	27
10A070	Y	Puyallup R @ Meridian St	S	A	2	25
10A110	Y	Puyallup R @ Orting	S	A	2	25
26B070	Y	Cowlitz R @ Kelso	S	A	2	25
26D070	Y	Toutle R nr Castle Rock	S	A	2	25
10A050	Y	Puyallup R @ Puyallup (USGS)	S	A	2	25
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Table 3. (Continued).

Station Number	Current? <sup>a</sup>	Station Name	Ecology Region	Class	Eco Region	WQI
OVERALL						
34B110	Y	SF Palouse R @ Pullman	E	A	7	100
09A060	Y	Duwamish R @ Allentown Br	N	B	2	50
GYS006	N	Grays Hbr @ E End Rennie Is.	S	A		49
34A070	Y	Palouse R @ Hooper	E	B	7	49
ELB010	Y	Duwamish Waterway @ 16th St Br	N	B		47
PSS015	Y	Snohomish R @ Highway 99 Bridge	N	A		47
PSS008	Y	Pt Gardner Bay @ Pier 3	N	B		46
GYS007	Y	Grays Hbr N Chnl nr Rayonier	S	B		45
41A070	Y	Crab Cr nr Beverly	E	B	7	45
PSS020	Y	Ebey Slough near Marysville	N	A		44



ATTACHMENT 1

DORIS BEATTY RINKER  
DIRECTOR



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane, LL-11 • Olympia, Washington 98504-6811 • (206) 753-2353

TO: Ed Rashin  
THROUGH: John Bernhardt  
FROM: Dave Hallock *DH*  
SUBJECT: Water Quality Index and State Standards  
DATE: February 26, 1988

The attached tables contain the current state water quality standards for temperature, oxygen, pH, bacteria, and percent saturation for fresh- and marine waters. There are also matching tables containing the approximate water quality index value which would correspond to the state standard for a given class of water. These values are necessarily approximations. For example, the standards state "...not to exceed ... due to human activities" with respect to temperature, but the criteria curves only consider the "not to exceed" part. In the case of bacteria, the standards are based on geometric means, while our ambient data are from single samples.

The purpose of these tables is to allow interpretation of the WQI as to whether or not a segment's water quality is meeting the segment's classification. For example, a Class B stream should have a WQI for temperature of less than 33. There have been cases where, for certain parameters, a segment's water quality was not compared to the criteria curves used to develop these tables but to some other curve; these instances were rare.

DH:cp  
Attachments

cc: Ruth Schaefer  
Lynn Singleton

Approximate Washington freshwater standards.

Parameter	CLASS		
	AA	A	B
Temperature ( $^{\circ}$ C)	<16	<18	<21
Oxygen (mg/L)	>9.5	>8.0	>6.5
pH	----	>6.5 and <8.5	---
Bacteria (#/100 mL)	<50	<100	<200
Percent Saturation	<110	<110	<110

A stream segment of a given class is meeting the state water quality standards for a specified parameter according to the WQI system if the WQI for that parameter is less than the WQI value indicated in the table below.

Parameter	CLASS		
	AA	A	B
Temperature ( $^{\circ}$ C)	13	20	33
Oxygen (mg/L)	9	20	32
pH	20	20	20
Bacteria (#/100 mL)	13	20	27
Percent Saturation	20	20	20

Approximate Washington marine standards.

Parameter	CLASS			
	AA	A	B	C
Temperature (°C)	<13	<16	<19	<22
Oxygen (mg/L)	>7.0	>6.0	>5.0	>4.0
pH	---->7.0 and <8.5----			>6.5 and <9.0
Bacteria (#/100 mL)	<14	<14	<100	<200
Percent Saturation	<110	<110	<110	None

A marine segment of a given class is meeting the state water quality standards for a specified parameter according to the WQI system if the WQI for that parameter is less than the WQI value indicated in the table below.

Parameter	CLASS			
	AA	A	B	C
Temperature (°C) (1988) <sup>a</sup> (1986)	10	20	33	50
	7	13	23	37
Oxygen (mg/L)	13	20	36	60
pH	20	20	20	40
Bacteria (#/100 mL)	20	20	45	60
Percent Saturation	20	20	20	None

<sup>a</sup>The freshwater criteria curves have been used in the past. In 1988, marine criteria curves will be used.