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STATE OF WASHINGTON
Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY
7272 Cleanwater Lane, Olympia, Washington 98504 206/753-2353

MEMORANDUM
July 16, 1979

To: John Spencer

From: John Bernhardt

Subject: Review of Water Quality Data for Colville Indian Reservation

Historically, there have not been many pollution problems on the Colville Indian Reservation. This is not surprising considering the fact that the reservation is located in a relatively remote area of the state, is sparsely populated, and has very little commercial development. Consequently, DOE has not had a need to conduct many water quality investigations in this area.

A relatively strong data base is available concerning the quality and quantity of water resources on the reservation, if all sources are considered. Major survey or monitoring work has been conducted by DOE, EPA, and USGS. Based on the findings of these studies, the quality of groundwater, streams, and lakes on the reservation appears to be quite good. A brief review follows.

DOE Routine Monitoring Data

DOE has one ambient monitoring station (52A070) located on the Sanpoil River near Keller (near the new mining site). These data indicate good-to-excellent water quality for the 1971-79 period of record. Occasional violations (minor) of state water quality standards for Class AA waters have occurred for dissolved oxygen, fecal coliforms, turbidity, and temperature. These appear to be naturally caused and associated mainly with summer low flows. The fecal coliform violations may be due to livestock. For reference, the water quality criteria for Class AA waters and monitoring data for station 52A070 are attached.

DOE Intensive Surveys

There is one survey on record. This was conducted in 1974 when the U.S. Forest Service had selected reservation lands treated with DDT to control an infestation of the Douglas fir tussock moth. DOE conducted water quality and biological (aquatic) impact studies to ensure that streams and other surface waters within the spray areas were protected. Results of this study are outlined in the following technical report:

> Tracy, H. B. and Dennis M. McGaughy, 1974. *A Report on Aquatic Monitoring of the 1974 Tussock Moth DDT Aerial Spray Project in Washington State*, Report No. DOE 75-17.

U.S. Geologic Survey

During the early 1970's, USGS surveyed in detail the quantity and quality of various water resources on the reservation. Over 30 streams, 12 lakes, and several wells were sampled for a wide range of parameters including dissolved minerals, fecal coliform bacteria, nutrients, etc. The report concluded that the quality of groundwaters, streams, and lakes on the reservation was generally good. Results of the USGS survey are given in the following publication:

> Harkness, R.E., D.A. Myers, and G.C. Bortleson, 1974. *Water Resources of the Colville Indian Reservation, Washington,* Dept. Int., Geo. Survey, Open-File Rept., Tacoma, WA.

A copy of this report is attached for review.

Environmental Protection Agency

EPA surveyed the Nespelem River system during 1975 to determine: (1) Effects of waste waters discharged by the city of Nespelem and Colville Indian Agency sanitary sewage lagoons; and (2) water quality status of the Nespelem River. The report documented one problem - high phosphorus (nutrient enrichment) in the Little Nespelem River; however, the Nespelem River system in general was considered to contain high quality waters. The reference is:

> Houck, Douglas R., No Date. *Nespelem River Study, July 14-18, 1975,* Surveillance and Analysis Div., EPA Region X, an informal report.

A copy is attached for review.

Other Sources

It is my feeling that the information documented above represents nearly all of the water quality data that has been collected on the Colville Indian Reservation. The tribe probably has some additional data and there may be some other small studies. It is my understanding that Edward Brock (WSU Zoology Dept.) has done some work on Omak Lake.

Please return the attached publications when through.

JB:cp

Attachments

(13) Nothing in this chapter shall be interpreted to be applicable to those aspects of governmental regulation of radioactive wastes which have been preempted from state regulation by the Atomic Energy Act of 1954, as amended, as interpreted by the United States Supreme Court in cases of Northern States Power Co. v. Minnesota 405 U.S. 1035 (1972) and Train v. Colorado Public Interest Research Group 426 U.S. 1 (1976).

WAC 173-201-045 GENERAL WATER USE AND CRITERIA CLASSES. The following criteria shall apply to the various classes of surface waters in the state of Washington:

(1) CLASS AA (EXTRAORDINARY).

(a) General Characteristic. Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

(b) Characteristic Uses. Characteristic uses shall include, but are not limited to, the following:

(i) Water supply (domestic, industrial, agricultural).

(ii) Wildlife habitat, stock watering.

(iii) General recreation and aesthetic enjoyment (picnicking, hiking, fishing, swimming, skiing, and boating).

(iv) General marine recreation and navigation.

(v) Fish and shellfish reproduction, rearing, and harvesting.

(c) Water Quality Criteria.

(i) Fecal Coliform Organisms.

(A) Freshwater - Fecal Coliform Organisms shall not exceed a median value of 50 organisms/100 ml, with not more than 10 percent of samples exceeding 100 organisms/100 ml.

(B) Marine water - Fecal Coliform Organisms shall not exceed a median value of 14 organisms/100 ml, with not more than 10 percent of samples exceeding 43 organisms/100 ml.

(ii) Dissolved Oxygen.

(A) Freshwater - Dissolved Oxygen shall exceed 9.5 mg/l.

(B) Marine water - Dissolved oxygen shall exceed 7.0 mg/l except when the natural phenomenon of upwelling occurs, natural dissolved oxygen levels can be degraded by up to 0.2 mg/l by man-caused activities.

(iii) Total dissolved gas - the concentration of total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.

(iv) Temperature - water temperatures shall not exceed 16.0° Celsius (freshwater) or 13.0° Celsius (marine water) due to human activities. Temperature increases shall not, at any time, exceed $t = 23/(T+5)$ (freshwater) or $t = 8/(T-4)$ (marine water).

When natural conditions exceed 16.0° Celsius (freshwater) and 13.0° Celsius (marine water), no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3° Celsius.

For purposes hereof, "t" represents the permissive temperature change across the dilution zone; and "T" represents the highest existing temperature in this water classification outside of any dilution zone.

Provided that temperature increase resulting from nonpoint source activities shall not exceed 2.8° Celsius, and the maximum water temperature shall not exceed 16.3° Celsius (freshwater).

(v) pH shall be within the range of 6.5 to 8.5 (freshwater) or 7.0 to 8.5 (marine water) with a man-caused variation within a range of less than 0.2 units.

(vi) Turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

(vii) Toxic, radioactive, or deleterious material concentrations shall be less than those which may affect public health, the natural aquatic environment, or the desirability of the water for any use.

(viii) Aesthetic values shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.

DEPARTMENT OF ECOLOGY

RETRIEVAL --- 11 JULY 1979

OFFICE OF WATER PROGRAMS
WATER QUALITY MANAGEMENT DIVISION
WATER & WASTEWATER MONITORING SECTION

52A070 SANPOIL RIVER AT KELLER 12434590

STORET MINOR BASIN: UPPER COLUMBIA STORET SUB BASIN: SANPOIL

LATITUDE: 48 05 04.0 ELEVATION (FEET): 1360 WATER CLASS: A
LONGITUDE: 118 41 25.0 COUNTY: FERRY SEGMENT: 23-52-03

AGENCY: 21540000 STATE: WASHINGTON STA TYPE: STREAM

TERMINAL STREAM	1ST LEV MILES	2ND LEV MILES	3RD LEV MILES	4TH LEV MILES	5TH LEV MILES	6TH LEV MILES
1310001	616.00	011.70	.	.	.	.

DATE FROM TO	TIME	DEPTH METERS	00060 STREAM FLOW CFS-AVG	00010 WATER TEMP DEG-C	00300 DISSOLVED OXYGEN MG/L	00301 DO PERCENT SATURATN	00400 pH STANDARD UNITS	00095 CONDUCTVY @ 25 C MICROMHOS	31504 TOTAL COLIFORM /100ML MF	31616 FECAL COLIFORM /100ML MF	00070 TURBIDITY JKSN JTU	00080 COLOR PT-CO UNITS
71/10/12	1730		50.0	12.2	10.4		8.0	205	200		1.0	12
71/10/19	1440		55.0	7.2	11.0		7.6	190	1200		3.0	14
71/11/09	1440		53.0	3.2	12.7		7.7	155	100K	40K	1.0	15
71/11/16	1445		50.0	6.5	12.1		7.8	210	150	20K	2.0	6
72/02/22	1400			3.6	13.2		7.9	205	60	20K	2.0	15
72/03/14	1400		1100.0	4.0	12.5		7.6	113	1300	22	35.0	71
72/03/28	1400		590.0	5.8	11.7		7.7	133	600	20K	5.0	52
72/04/11	1530		908.0	6.6	11.6		7.9	122	350	20K	9.0	53
72/04/25	1515		575.0	8.9	11.3		7.7	139	150	20K	5.0	40
72/05/09	1520		698.0	9.4	12.2		7.7	113	500	40K	7.0	58
72/05/23	1515		1020.0	12.5	10.0		7.6	120			9.0	78
72/06/13	1500		420.0	13.8	12.3		7.9	161	1200	25	4.0	49
72/06/27	1450		255.0	17.0	9.3		7.9	180	150	20K	2.0	40
72/07/11	1540		131.0	18.0	9.0		8.3	211	600	20K	2.0	22
72/07/25	1530		80.0	21.9	9.5		8.2	148	150	20K	1.0	20
72/08/09	1500		42.0	25.2	9.9		7.9	221	100	20K	1.0	16
72/08/22	1520		69.0	20.0	5.2		8.0	221	500	29	1.0	21
72/09/12	1500		41.0	16.0	9.6		8.6	215	200	20K	1.0	16
72/09/26	1500		66.0	8.4	10.9		8.2	210	190	20K	1.0	15
74/10/23	1110			5.6	12.2		7.8	220	270	6B	2.0	14
75/03/19	1140			4.4	13.0		7.7	190	180	6B	5.0	20
75/05/21	1050			9.7	10.8		7.8	120	160L	12B	15.0	67
75/08/20	1135			17.9	9.9		7.8	190	200L	80	2.0	21
75/10/22	1755		252.0	8.0	11.5		8.1	210	20K	5K	3.0	25
75/10/29	1710		109.0	6.4	11.4		7.5	230	300B	20B	2.0	21
75/11/13	0740		117.0	0.3	13.4		7.9	220	120B	12B	2.0	13
75/11/20	0730		109.0	0.0	14.0		7.9	220	30B	8B	3.0	21
75/12/10	1620		114.0	2.9	12.7		7.6	200	20B	4B	3.0	17
75/12/18	0900		190.0	0.0	14.2		8.1	270	60B	2K	2.0	17
76/01/08	0815		125.0	0.2	13.6		7.2	210	32B	6B	2.0	17
76/01/22	0810		117.0	0.3	13.9		7.9	210	14B	2K	2.0	17
76/02/26	0745		131.0	1.1	12.9		7.7	200	12B	2B	3.0	17
76/03/11	0750		117.0	1.9			7.9	210	80B	2B	3.0	13
76/03/25	0730		298.0	2.2	12.7		7.4	180	200B	10K	11.0	38
76/04/15	0720		995.0	4.8	11.7		7.8	130	150B	6B	17.0	42
76/04/29	0830		725.0	6.3	12.1		7.8	133	110	10B	11.0	54

76/05/13	0815		10.0	10.9		7.7	123	100B	12B	11.0	58
76/05/27	0900	444.0	12.3	10.3		7.4	142	600B	8B	7.0	42
76/06/10	0720	376.0	13.3	9.7		7.7	150	1200B	28B	8.0	38
76/06/24	0720	252.0	11.7	10.3		7.8	170	100B	26B	5.0	25
76/07/15	0715	123.0	15.3	9.3		8.0	192	220B	12B	2.0	21
76/07/29	0725	69.0	18.2	6.9		8.2	210	100B	26B	1.0	13
76/08/12	0730	99.0	16.5	9.3		8.0	203	500B	16B	2.0	25
76/08/26	0700		11.8	9.8		8.0	209	760B	3B	3.0	21
76/09/16	0635	58.0	13.0	9.3		8.1	210	250B	42	2.0	21
76/09/23	0655	52.0	14.0	9.2		8.1	219	300B	15B	1.0	13
77/10/21	1040	29.0	6.5	12.2	104.4	7.7	233			0.0	0
77/12/28	1425	71.0	0.1	14.2	102.5	7.7	267			0.0	5
78/03/15	1000	284.0	2.7	13.5	104.7	7.8	178			2.0	10
78/05/24	1345	680.0	9.7							4.0	20
78/07/18	1140	160.0	18.6	9.1	102.4	7.6	185				
78/09/14	1030	96.0	12.8	10.4		7.8	190			1.0	5
78/11/21	1300										
79/03/23	0900		4.0	12.7		8.2	148				11

DATE FROM TO	TIME	DEPTH METERS	00625 KJELDAHL NITROGEN T MG/L N	00630 NITROGEN NO2 + NO3 MG/L	00620 NITRATE T NO3-N MG/L	00615 NITRITE T NO2-N MG/L	00610 AMMONIA T NH3-N MG/L	00671 DIS-ORTHO PHOSPHATE MG/L P	00665 TOTAL PHOSPHATE MG/L P	00410 ALKALINE T CACO3 MG/L	00440 BICARB HCO3 ION MG/L	00900 HARDNESS TOT CACO3 MG/L
71/10/12	1730		0.120		0.02	0.00	0.03	0.02	0.03	97	118	94
71/10/19	1440		0.110		0.07	0.00	0.06	0.01	0.10	86	105	84
71/11/09	1440		0.090		0.07	0.00	0.00	0.02	0.03	90	110	93
71/11/16	1445		0.260		0.07	0.00	0.07	0.03	0.04	90	110	87
72/02/22	1400		0.220		0.12	0.00	0.03	0.02	0.02	85	104	90
72/03/14	1400		0.310		0.28	0.02	0.27	0.03	0.19	48	58	48
72/03/28	1400		0.270		0.13	0.02	0.01	0.01	0.08	55	67	55
72/04/11	1530		0.230		0.06	0.01	0.03	0.03	0.07	52	64	50
72/04/25	1515		0.350		0.02	0.01	0.04	0.02	0.06	59	72	56
72/05/09	1520		0.610		0.06	0.01	0.12	0.01	0.05	52	63	48
72/05/23	1515		0.410		0.04	0.02	0.07	0.02	0.07	48	59	46
72/06/13	1500		0.770		0.05	0.00	0.13	0.04	0.06	67	82	66
72/06/27	1450		0.650		0.07	0.00	0.08	0.02	0.04	74	90	74
72/07/11	1540		0.500		0.07	0.00	0.05	0.03	0.04	86	105	81
72/07/25	1530		0.760		0.08	0.00	0.11	0.01	0.03	84	103	88
72/08/09	1500		0.280		0.09	0.00	0.03	0.03	0.04	89	109	89
72/08/22	1520		0.500		0.03	0.00	0.13	0.00	0.00	89	108	87
72/09/12	1500		0.090		0.03	0.00	0.01	0.01		91	111	91
72/09/26	1500		0.160		0.02	0.00	0.02	0.02	0.02	90	110	87
74/10/23	1110			0.02			0.02	0.02	0.04			
75/03/19	1140			0.08			0.05	0.03	0.06			
75/05/21	1050			0.03			0.04	0.02	0.09			
75/08/20	1135			0.31			0.14	0.02	0.04			
75/10/22	1755			0.02			0.06	0.03	0.05			
75/10/29	1710			0.06			0.04	0.03	0.04			
75/11/13	0740			0.01			0.05	0.02	0.03			
75/11/20	0730			0.03			0.04	0.02	0.03			
75/12/10	1620			0.03			0.03	0.02	0.03			
75/12/18	0900			0.03			0.02	0.02	0.03			
76/01/08	0815			0.06			0.02	0.02	0.03			
76/01/22	0810			0.06			0.02	0.02	0.03			
76/02/26	0745			0.01			0.06	0.02	0.03			
76/03/11	0750			0.02			0.02	0.02	0.04			
76/03/25	0730			0.10			0.09	0.03	0.11			
76/04/15	0720			0.06			0.06	0.02	0.11			
76/04/29	0830			0.02			0.06	0.01	0.06			
76/05/13	0815			0.01			0.05	0.01	0.07			
76/05/27	0900			0.03			0.05	0.02	0.06			
76/06/10	0720			0.02			0.04	0.02	0.08			
76/06/24	0720			0.01			0.05	0.02	0.06			
76/07/15	0715			0.00			0.04	0.03	0.05			

76/07/29	0725	0.08	0.04	0.03	0.04
76/08/12	0730	0.00	0.06	0.03	0.04
76/08/26	0700	0.01	0.01	0.03	0.04
76/09/16	0635	0.01	0.05	0.02	0.03
76/09/23	0655	0.00	0.02	0.02	0.04
77/10/21	1040	0.01	0.02	0.01	0.02
77/12/28	1425	0.09	0.02	0.01	0.02
78/03/15	1000	0.05	0.02	0.03	0.06
78/05/24	1345	0.01	0.03	0.03	0.06
78/07/18	1140				
78/09/14	1030	0.08	0.02	0.02	0.03
78/11/21	1300	0.03	0.02	0.01	0.04
79/03/23	0900	0.08	0.02	0.10	0.04

DATE FROM TO	TIME	DEPTH METERS	00902 HARDNESS NC CACO3 MG/L	00915 CALCIUM DIS CA MG/L	00925 MAGNESIUM DIS MG MG/L	00930 SODIUM DIS NA MG/L	00935 POTASSIUM DIS K MG/L	00940 CHLORIDE CL MG/L	00945 SULFATE TOT SO4 MG/L	71900 MERCURY TOTAL HG UG/L	01030 CHROMIUM DIS CR UG/L	01040 COPPER DIS CU UG/L
71/10/12	1730		0	27.0	6.4	6.70	2.00	1	16	0.20		0
71/10/19	1440		0	24.0	5.8	6.20	1.20	2	15	0.10		1
71/11/09	1440		3	27.0	6.2	6.40	1.40	1	15	4.00		0
71/11/16	1445		0	25.0	6.0	6.80	1.50	1	15			
72/02/22	1400		5	26.0	6.1	6.30	1.60	1	18	1.30	0	0
72/03/14	1400		0	14.0	3.1	4.30	1.30	0	8	1.10	0	1
72/03/28	1400		1	16.0	3.9	4.80	1.30	0	10	0.00	0	1
72/04/11	1530		0	14.0	3.6	5.00	1.20	0		0.50	0	2
72/04/25	1515		0	16.0	4.0	4.30	1.60	0	9	0.30	0	2
72/05/09	1520		0	14.0	3.4	4.50	1.20	1	7	0.00	0	1
72/05/23	1515		0	13.0	3.2	5.20	1.00	0	6	0.30	0	1
72/06/13	1500		0	19.0	4.4	5.20	1.20	0	14	1.00	0	4
72/06/27	1450		0	22.0	4.7	6.50	1.80	0	11	2.50	0	20
72/07/11	1540		0	24.0	5.2	6.60	1.50	1	12	2.80	0	4
72/07/25	1530		4	26.0	5.7	6.40	1.60	2	14	0.30	0	1
72/08/09	1500		0	26.0	5.9	6.50	1.40	0	14	0.20	0	2
72/08/22	1520		0	25.0	6.0	6.60	1.40	0	15	0.40	0	0
72/09/12	1500		0	26.0	6.3	6.80	1.30	1	15	0.20	0	0
72/09/26	1500			25.0	6.1	6.60	1.30	0	15	0.20	0	1
74/10/23	1110									0.00	0	1
75/03/19	1140									0.30	0	1
75/05/21	1050									0.00	0	1
75/08/20	1135									0.00	0	1
75/10/22	1755									0.20	0	2
75/10/29	1710									0.00	0	2
75/11/13	0740									0.00	0	1
75/11/20	0730									0.00	0	1
75/12/10	1620									0.00	0	2
75/12/18	0900									0.10	0	1
76/01/08	0815									0.00	0	1
76/01/22	0810									0.00	0	6
76/02/26	0745									0.00	0	2
76/03/11	0750									0.00	0	1
76/03/25	0730									0.00	0	1
76/04/15	0720									0.00	0	0
76/04/29	0830									0.00	0	1
76/05/13	0815									0.30	0	2
76/05/27	0900									0.00	0	4
76/06/10	0720									0.00	0	7
76/06/24	0720									0.00	0	1
76/07/15	0715									0.00	10	1
76/07/29	0725									0.00	0	3
76/08/12	0730									0.00	0	2
76/08/26	0700									0.00	50	
76/09/16	0635									0.00	0	2
76/09/23	0655									0.00	0	1

77/10/21	1040						
77/12/28	1425						
78/03/15	1000						
78/05/24	1345						
78/07/18	1140						
78/09/14	1030						
78/11/21	1300						
79/03/23	0900						

DATE FROM TO	TIME	DEPTH METERS	01049 LEAD DIS PB UG/L	01090 ZINC DIS ZN UG/L	01145 SELENIUM DIS Se UG/L	00310 BOD 5 DAY MG/L	31625 FECAL COLIFORM /100ML MA
71/10/12	1730		0	10			
71/10/19	1440		2	0			
71/11/03	1440		0	20			
71/11/16	1445						
72/02/22	1400		2	130			
72/03/14	1400		2	0			
72/03/28	1400		0	20			
72/04/11	1530		3	10			
72/04/25	1515		2	20		2.0	
72/05/09	1520		0	20			
72/05/23	1515		1	10			
72/06/13	1500		0	20			
72/06/27	1450		100	40			
72/07/11	1540		2	10		2.0K	
72/07/25	1530		2	0			
72/08/09	1500		1	10			
72/08/22	1520		2	0			
72/09/12	1500		2	0			
72/09/26	1500		0	0			
74/10/23	1110		1	20			
75/03/19	1140		11	10			
75/05/21	1050		7	0			
75/08/20	1135		1	0			
75/10/22	1755		3	0			
75/10/29	1710		4	0			
75/11/13	0740		3	0			
75/11/20	0730		3	0			
75/12/10	1620		4	0			
75/12/18	0900		4	0			
76/01/08	0815		4	0			
76/01/22	0810		4	0			
76/02/26	0745		4	10			
76/03/11	0750		2	0			
76/03/25	0730		0	0			
76/04/15	0720		0	0			
76/04/29	0830		0	0			
76/05/13	0815		5	0			
76/05/27	0900		6	0			
76/06/10	0720		4	0			
76/06/24	0720		2	0			
76/07/15	0715		2	0			
76/07/29	0725		3	0			
76/08/12	0730		3	0			
76/08/26	0700						
76/09/16	0635		3	0			
76/09/23	0655		3	0			
77/10/21	1040				10		
77/12/28	1425				5		
78/03/15	1000				4		
78/05/24	1345						
78/07/18	1140				116		
78/09/14	1030						22
78/11/21	1300						
79/03/23	0900						2