

Division of Geological & Geophysical Surveys

Public-data File 92-11

**MISCELLANEOUS WATER QUALITY AND STREAM FLOW DATA FROM
THE GOLD CREEK DRAINAGE BASIN, JUNEAU, ALASKA**

by

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Division of Water

Released by

STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
Division of Geological &
Geophysical Surveys

in cooperation with
Division of Water

April 1992

**THIS REPORT HAS NOT BEEN REVIEWED FOR
TECHNICAL CONTENT (EXCEPT AS NOTED IN TEXT) OR FOR
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INTRODUCTION

The Alaska Department of Natural Resources collected miscellaneous geochemical and stream flow data intermittently in the Gold Creek drainage basin between 1989 and 1991. The data presented in this report are not otherwise contained in accessible databases. The Gold Creek watershed is located east of downtown Juneau, has an area of approximately 10 square miles, and discharges into Gastineau Channel. Field notes are located in the Juneau Office of the Division of Water.

METHODS

Alkalinity and pH determinations were done in the field at the time of sampling if possible. Alkalinity was done at the end of the day in the office if outside air temperature prevented proper titration.

Water samples were collected in a one liter Nalgene bottle. The collection bottle was rinsed with deionized water before each sample collection, and then rinsed three times with sample water. From the sample collection bottle, a 125 ml subsample was filtered (.45um Millipore Type HA) and fixed with five to eight drops of ultra-pure nitric acid for cation determination. A second 125 ml subsample was filtered and collected for anion determination. All samples were kept at approximately 4 degrees Celsius in a cooler.

All samples were sealed with tape and mailed first class to DNR's Water Quality laboratory in Fairbanks following the chain of custody procedures described by Munter and others (1990). A separate cover letter listing all samples, with dates and times of collection, was sent at the same time to ensure all samples arrived.

Stream flows were measured with a pygmy meter and top setting wading rod using the midsection method (Rantz and others, 1982). Locations were selected where the stream has relatively straight reaches, with laminar flow, and without turbulent or choppy water. A cross-section was selected that was free from obstructions such as logs, weeds, and large boulders. Standard procedures were followed as outlined in Lyons (1988), and Rantz and others, (1982).

RESULTS

Data are listed in Tables-1 through 3 for clarity and convenience. Original laboratory reports are contained in Appendix A. Original discharge data sheets are contained in Appendix B.

Table-1 contains major ion results for three separate sampling rounds. February 7th and 8th, 1990 samples were collected during a winter low flow period with a Gold Creek average daily flow of 11 and 9.9 cfs, respectively. September 26th, 1990 samples were collected with a Gold Creek average daily flow of 99 cfs. February 15th, 1991 samples were collected after a pump test of the City and Borough of Juneau's well field.

Table-2 contains stable isotope results collected May 14th and 15th, 1991. Samples were analyzed by the Stable Isotope Laboratory at Southern Methodist University in Dallas, Texas.

Table-3 contains stream discharge measurements. The December 7th, 1990 flow was measured at the same time as the USGS and Echo Bay Mines personnel to verify methods and results. The December 19th, 1990 measurements were to document the recharge in the upper reach in Last

Chance Basin. The November 4th, 1991 measurements were to verify the amount of discharge in Gold Creek from Silverbow Basin, Granite Creek, and the Nowell placer drainage tunnel.

ACKNOWLEDGMENTS

Roman Motyka of DGGs and John Dunker of DOW provided help in the field, Scott Ray and Jim Vohden of DOW at the Fairbanks laboratory analyzed the samples, and Jim Munter of DOW provided technical review and comment on the results.

Table-1
DNR SAMPLING RESULTS
for
Gold Creek Drainage Basin

All units mg/l except pH
See Figure-1 for location of sample sites

7 February 1990
Gold Creek flow: 11 cfs

Location	Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	pH
Spring near PW-1	27.9	3.16	0.94	0.78	76.5	13.8	1.5	7.23
USGS gage	27.0	8.98	1.36	1.50	42.6	57.3	1.7	7.79
Tunnel	114	79.0	8.80	5.17	136	489	1.3	8.51
PW-3	21.8	5.63	0.84	1.08	40.2	31.9	1.7	7.09

8 February 1990
Gold Creek flow: 9.9 cfs

Ebner Falls	10.6	1.75	0.57	0.84	25.6	9.60	2.1	7.89
Spring Line	21.9	6.43	0.93	1.16	44.0	34.5	2.1	7.65

26 September 1990
Gold Creek flow: 99 cfs

Location	Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	pH
Mt. Juneau Talus Slope flow	10.6	2.84	0.77	0.28	34.0	4.07	0.37	6.23
USGS gage	16.6	4.62	0.84	0.98	34.0	31.3	0.34	7.87
Tunnel	89.4	34.5	3.12	4.13	121	214	0.10	7.87
PW-3	16.2	3.55	1.01	0.89	39.1	20.9	0.37	7.49
Gold Ck above tunnel	7.76	1.01	0.55	0.62	21.6	4.09	0.28	6.18
Spring Line	14.7	2.77	0.81	0.87	36.7	13.7	0.34	7.44

15 February 1991
Gold Creek flow: 85 cfs

Location	Ca	Mg	Na	K	HCO ₃	SO ₄	Cl	pH
Seep near chlorination bldg	25.5	4.09	1.3	1.04	61.0	22.3	0.79	6.75
USGS gage	14.5	2.90	1.0	0.84	31.7	20.4	0.83	7.98
Ditch across from PW-4	23.5	12.2	1.2	1.10	48.8	37.6	0.74	6.60
Spring Line	23.2	4.52	1.1	0.97	43.9	33.3	0.72	7.23

Table-2
DNR SAMPLING RESULTS
for
Stable Isotopes¹
from the
Gold Creek Drainage Basin

See Figure-1 for location of sample sites

Location	Sample Date	¹⁸ O/ ¹⁶ O (PDB-CO ₂)	D/H (SMOW)
Mt. Juneau Talus Slope flow	5/14/90	-13.78	-101.8
Mt. Juneau Talus Slope flow	5/14/90	-13.75	-102.8
USGS gage	5/14/90	-14.62	-104.4
Tunnel	5/14/90	-13.93	-100.2
PW-3	5/15/90	-13.52	-98.1
Gold Ck above tunnel	5/14/90	-14.61	-102.3
Spring Line	5/14/90	-13.95	-100.1

¹Analyzed by: Stable Isotope Laboratory, Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas.

Table-3
DNR Instantaneous
Stream Discharge Measurements

See Figure-1 for location of sample sites

Date	Time	Location	Flow	Remarks
12/7/90	0945	Gold Creek, Bridge at Salmon Bake	29.8	
12/19/90	1200	Gold Creek, ore cart half way between tunnel and Salmon Bake bridge	13.3	
12/19/90	1400	Gold Creek, Bridge at Salmon Bake	7.33	
11/4/91	0942	Gold Creek, 250m above bridge over Granite Creek	1.08	Gold Creek flow out of Silverbow Basin
11/4/91	1033	Gold Creek, 250m below bridge over Granite Creek	10.9	Combined Gold Creek flow out of Silverbow Basin and Granite Creek flow
11/4/91	1130	Flow from Nowell placer drainage tunnel	8.31	Flow out of Silverbow basin that is within 400 feet of glory holes
11/4/91	1230	Gold Creek, 100m above metal trail bridges	23.3	Gold Creek flow increase from talus slope base flow

REFERENCES CITED

- Lyons, S., 1988, Stream Discharge Measurement Handbook, U.S. Department of the Interior, Fish and Wildlife Service, Region 7, 15 p.
- Munter, J.A., Maurer, M.A., and Moorman, M., 1990, Evaluation of the hydrology and geology of the Moonlight Springs area, Nome, Alaska: quality assurance project plan: Alaska Division of Geological and Geophysical Surveys Public-Data File 90-8, 23 p.
- Rantz S.E. and others, 1982, Measurement and Computation of Streamflow: Volume 1: U.S. Geological Survey Water-Supply Paper 2175, Chapter 5, 284 p.

APPENDIX A
LABORATORY REPORTS

Feb 7, 1990

Site Name	T	pH	Na	K	Ca	Mg	Li	Cations	HCO3	SO4	F	Cl	Arcons	Bal	X	SiO2	H2S	TDS
RM89TAT-hot	68	8.41	110.00	4.15	17.8	0.64	0.59	5.92	188.0	18.8	22.00	23.30	5.33	10.5	30.0	3.74		373.6
PW-1		7.23	0.94	0.78	27.9	3.16	0.00	1.71	76.5	13.8	0.05	1.50	1.59	7.7	2.0			87.8
USGS -stat		7.79	1.36	1.50	27.0	8.98	0.00	2.18	42.6	57.3	0.03	1.70	1.94	11.8	3.0			121.9
AJ Mine		8.51	8.80	5.17	114.0	79.00	0.00	12.70	136.2	489.0	0.07	1.30	12.45	2.0	3.0			767.4
PW-3		7.09	0.84	1.08	21.8	5.63	0.00	1.61	40.2	31.9	0.02	1.70	1.37	16.2	2.0			84.8
Ebner Falls		7.87	0.57	0.84	10.6	1.75	0.00	0.72	25.6	9.6	0.02	2.10	0.68	5.7	2.2			40.3
Spring Line		7.65	0.93	1.16	21.9	6.43	0.00	1.69	44.0	34.5	0.02	2.10	1.50	12.0	3.3			92.0
RM89TAT-cold			2.25	0.17	1.7	1.25	0.00	0.29		4.2	0.21	4.20	0.22	28.6	6.9			20.9

OCT 24 '90 14:33 SOA/DNR/DGGS

P.2/4

26 Sept Sampled

Data for Rick Noll

SAMPLE ID	ALL VALUES IN MG/L		NITRATE	PHOSPHATE	SULFATE	pt
	FLUORIDE	CHLORIDE				
Mt. Juneau	0.09	0.37	0.15	<0.01	4.07	6.73
Gold Creek	0.06	0.28	0.19	<0.01	4.09	6.18
Spring line	0.11	0.34	0.13	<0.01	13.7	7.44
AJ Tunnel	0.57	0.10	0.11	<0.01	214	7.87
PW-3	0.12	0.37	0.17	<0.01	20.9	7.44
USGS	0.14	0.34	0.19	<0.01	31.3	7.87

SAMPLE ID	ALL VALUES IN MILLIEQUIVALENTS				
	FLUORIDE	CHLORIDE	NITRATE	PHOSPHATE	SULFATE
Mt. Juneau	4.74	10.45	10.71	0.00	84.79
Gold Creek	3.16	7.91	13.57	0.00	85.21
Spring Line	5.79	9.60	9.29	0.00	285.42
AJ Tunnel	30.00	2.82	7.86	0.00	4458.33
PW3	6.32	10.45	12.14	0.00	435.42
USGS	7.37	9.60	13.57	0.00	652.08

OCT 24 '90 14:33 SOA/DNR/DGGS

P.3/4

CALCIUM	MAGNESIUM	SODIUM	POTASSIUM	ALKALINITY
10.6	2.84	0.77	0.28	34.0
7.76	1.01	0.55	0.62	21.6
14.7	2.77	0.81	0.87	36.7
89.4	34.5	3.12	4.13	121
16.2	3.55	1.01	0.89	39.1
16.6	4.62	0.84	0.98	34.0

CALCIUM	MAGNESIUM	SODIUM	POTASSIUM	ALKALINITY	SUM(ANIONS)
528.94	233.74	33.49	7.16	680.00	790.69
387.23	83.13	23.92	15.86	432.00	541.85
733.53	227.98	35.23	22.25	734.00	1044.10
4461.08	2839.51	135.71	105.63	2420.00	6919.02
808.38	292.18	43.93	22.76	782.00	1246.33
828.34	380.25	36.54	25.06	680.00	1362.63

OCT 24 '90 14:34 SOA/DNR/DGGS

P.4/4

SUM(CATIONS)	DIFFERENCE	% Diff
803.34	-12.65	-1.58668318
510.13	31.71	6.029373096
1019.00	25.10	2.432901768
7541.92	-622.91	-8.61502203
1167.26	79.07	6.551968577
1270.19	92.44	7.021819182

State of Alaska
Division of Geological and Geophysical Surveys
Water Quality Laboratory
 209 O'Neill University of Alaska Fairbanks Fairbanks, Alaska 99775 (907)474-7713

Client: DGGS / Juneau

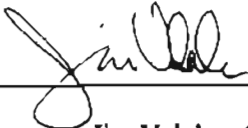
Submitted By: Rick Noll

Date Submitted: February, 1991

Sample	Fluoride	Chloride	Nitrate	Phosphate	Sulfate
SP1	0.28	0.79	0.28	<DL	22.3
USGS	0.10	0.83	0.42	<DL	20.4
Ditch Flow	0.15	0.74	0.34	<DL	37.6
Spring Line	0.14	0.72	0.31	<DL	33.3
Units	mg/l	mg/l	mg NO ₃ *N/l	mg PO ₄ *P/l	mg/l
EPA Method	300.0	300.0	300.0	300.0	300.0
Detection Limit	0.01	0.01	0.02	0.1	0.01
RPD	1.9	2.2	4.0	*	1.0
% Recovery	99	92	90	96	94

* Relative Percent Difference (RPD) cannot be calculated when values are below detection limit.

Approved By _____



Jim Vohden, Chemist

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Date 28 FEB 91

State of Alaska
Division of Geological and Geophysical Surveys
Water Quality Laboratory
 209 O'Neill University of Alaska Fairbanks Fairbanks, Alaska 99775 (907)474-7713

Client: DGGS / Juneau
 Submitted By: Rick Noll
 Date Submitted: February, 1991

Sample	Calcium	Magnesium	Sodium	Potassium	Iron	Manganese
SP1	25.5	4.09	1.3	1.04	0.22	0.05
USGS	14.5	2.90	1.0	0.84	0.11	<DL
Ditch Flow	23.5	12.2	1.2	1.10	0.12	<DL
Spring Line	23.2	4.52	1.1	0.97	0.12	<DL
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
EPA Method	AES 0029	AES 0029	273.1	258.1	AES 0029	AES 0029
Detection Limit	0.01	0.01	0.1	0.01	0.03	0.01
RPD	9.4	1.2	0.2	1.8	3.8	5.1
% Recovery	104	103	96	99	103	91

Approved By Jim Vohden Date 28 FEB 91
 Jim Vohden, Chemist
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State of Alaska; Noll
6 samples received 6/23/90
Analyses by: SMU/ISEM Stable Isotope Laboratory

Sample	18O/16O(PDB-CO2)		D/H(SMOW)	
Spring Line	-13.95		-100.1	
PW3	-13.52		-98.1	
GC-1	-14.61		-102.3	
Tunnel	-13.93		-100.2	
Mt. Juneau	-13.78	-13.75	-101.8	-102.8
USGS Station	-14.62		-104.4	

APPENDIX B
DISCHARGE DATA SHEETS

Dist. from initial point	Width	Depth	Channel cross length	Revolutions	Time in seconds	VELOCITY		Adjusted for bar angle or	Area	Discharge
						At point	Mean in vertical			
33.4	.45									
32.5	.7	.56		5	43	.140			.392	.055
32.0	.9	.61		25	47	.546			.549	.300
30.7	1.05	.66		25	46	.557			.693	.386
29.9	.85	1.4		25	46	.557			1.190	.663
29.0	.95	.9		35	41	.990			.855	.752
28.0	1	1.31		50	43	1.16			1.31	1.520
27.0	1	1.4		40	43	.936			1.4	1.31
26.0	1	1.6	.8	50	41	1.22	1.124		1.6	1.798
"	"	"	3.2	45	44	1.028			-	-
25.0	1	1.6	3.2	60	44	1.36	1.235		1.6	2.04
"	"	"	.8	50	42	1.19			-	-
24.0	1	1.60	.8	40	45	.805	1.138		1.6	1.821
"	"	"	3.2	80	54	1.47			-	-
23.0	1	1.42		50	42	1.19			1.42	1.69
22.0	1	1.62	2.8	60	42	1.42	1.019		1.62	1.699
"	"	"	.8	30	45	.678			-	-
21.0	1	1.62	.8	40	41	.980	1.127		1.62	2.057
"	"	"		80	51	1.56			-	-
20.0	1	1.74	.85	25	42	.608	1.14		1.74	1.984
"	"	"		60	42	1.42			-	-
19.0	1	1.52	.75	50	43	.918	1.254		1.52	1.906
"	"	"		80	51	1.56			-	-
18.0	1	1.08		60	43	1.35			1.08	1.501
17.0	1	1.26		80	54	1.47			1.26	1.852
16.0	1	1.24		60	43	1.39			1.24	1.724
15.0	1	1.06		60	40	1.49			1.06	1.579
14.0	1	.84		50	40	1.25			.84	1.05
13.0	1	.89		50	40	1.25			.89	1.113
12.0	1	.80		40	45	.995			.80	.716
11.0	1	.50		20	48	.633			.50	.217
10.0	1	.36		3	50	.085			.36	.031

Dist. from initial point	Width	Depth	Observed time depth	Revolutions	Time in seconds	VELOCITY		Adjusted for bar. angle or	Area	Discharge	
						At point	Mean in vertical				
9.0	.5			0	0	—					.80
LEW	11:35am										.84
											.90
											.92
											.94
											.96
											.98
											1.00
											.99
											.98
											.97
											.96
											.94
											.93
											.90
											.85
											.80

*Gold Creek Between Snowslide Gulch
A DEC 90 § Salmon body*

State of Alaska
Dept. of Natural Resources
Div. of Geological & Geophysical Surveys

Meas. No. _____

WATER RESOURCE INVESTIGATIONS

Comp. by *RH*

DISCHARGE MEASUREMENT NOTES

Checked by *RJM*

Sta. No. *LCB-1*

90 ft from W. side of JP River

Date *12/19*, 19*90* Party *RH, RJM, R. J. ...*

Width *17.4* Area *14.38* Vel. *1.2* G. H. _____ Disch. *18.30 CFS*

Method _____ No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time	Recorder	Inside	Outside	
				Type of meter <i>P 19 m. g.</i>
				Date rated <i>1-1-79</i> for rod, other _____
				Meter _____ ft. above bottom of weight _____
				Spin before meas. <i>49 sec</i> after <i>32</i>
				Meas. plots _____ % diff. from rating _____
				Wading cable, ice, boat, upstr., downstr., side _____
				bridge _____ feet, mile, above, below _____
				gage, and _____
				Check-bar, found _____
				changed to _____ at _____
				Correct _____
				Levels obtained _____
Weighted M. G. H. ...				
G. H. correction ...				
Correct M. G. H. ...				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow *sluggish turbulent* Weather *cold & clear*

Other _____ Air *12.8* °F @ *14:00*

Gage _____ Water *37* °F @ *11:45*

Record removed _____ Intake flushed *U*

Observer _____

Control _____

Remarks _____

G. H. of zero flow _____ ft.

No. of Sounding	Dist. from initial point (ft)	Width	Depth	Obser- vations	Revo- lutions	Time in sec- onds	VELOCITY		Adjusted for hor. angle or	Area	Discharge
							At point	Mean in ver- tical			
R11	11.0	1	1.01		0						
	12	1	.7		3	46	0.09			0.7	0.06
	13	1	0.88		40	54	0.75			0.88	0.66
	14	1	1.0		60	44	1.36			1.0	1.36
	15	1	1.31		40	42	0.957			1.31	1.25
	16	1	1.32		50	47	1.07			1.32	1.41
	17	1	1.28		60	40	1.49			1.28	1.91
	18	1	1.05		60	42	1.42			1.05	1.49
	19	1	1.00		80	45	1.76			1.0	1.76
	20	1	0.92		60	44	1.36			0.92	1.25
	21	1	0.78		25	42	.608			0.78	0.47
	22	1	0.74		20	41	.503			0.74	0.37
	23	1	0.80		25	47	.546			0.80	0.47
	24	1	0.85		20	44	.470			0.85	0.40
o	25	1	0.75		15	47	.338			0.75	0.15
	26	1	1.00		10	54	.207			1.00	0.21
	274										
	13.30										

Gold Creek Salmon Bar Bridge
19 DEC 90

State of Alaska
Dept. of Natural Resources
Div. of Geological & Geophysical Surveys

Meas. No.

WATER RESOURCE INVESTIGATIONS

Comp. by

DISCHARGE MEASUREMENT NOTES

Checked by

Sta. No. 40
Salmon Bar Area
Date 12/19 1990 Party 101 & RSM
Width 21.0 Area 20.80 Vel. .35 G. H. Disch. 733 cfs
Method No. secs. G. H. change in hrs. Susp.
Method coef. Hor. angle coef. Susp. coef. Meter No.

GAGE READINGS			
Time	Recorder	Inside	Outside

Type of meter 1.4 m
Date rated 1-4-89 for rod, other.
Meter ft. above bottom of weight.
Spin before meas. FROZEN after FROZEN
spin back at office = 46 sec
Meas. plots % diff. from rating ..
Wading cable, ice, boat, upstr., downstr., side
bridge feet, mile. above, below
gage, and
Check-bar, found 4.3 ft
changed to at
Correct
Levels obtained

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following
conditions: Cross section meter was frozen at start

Flow Weather Cold & Cloudy
Other Air 1 °F @ 1:31 PM
Gage Water 33 °F @
Record removed Intake flushed U
Observer

Control
Remarks

G. H. of zero flow ft.



S-768

F. S. DARLINE CORP.
14204 WASH. U.S.A.

.0 .10 .20 .30 .40 .50 .60 .70 .75
River at—

Angle and sight	Dist. from initial point	Width	Depth	Observ- tion depth	Revo- lutions	Time in sec- onds	VELOCITY		Adjusted for hor. angle or -----	Area	Discharge
							At point	Mean in ver- tical			
	611.18										
	9.0										
	10.0	1	0.63		3	56	.078		0.63	0.05	
	11.0	1	0.73		10	44	.248		0.73	0.18	
	12.0	1	0.70		10	53	.210		0.70	0.15	
	13.0	1	0.80		10	49	.225		0.80	0.18	
	14.0	1	0.87		10	48	.230		0.87	0.20	
	15.0	1	1.02		20	52	.402		1.02	0.41	
	16.0	1	1.11		20	54	.388		1.01	0.39	
	17.0	1	1.09		15	62	.263		1.09	0.29	
	18.0	1	1.22		20	42	.492		1.22	0.60	
	19.0	1	1.35		20	46	.451		1.35	0.64	
	20.0	1	1.35		20	46	.451		1.35	0.61	
	21.0	1	1.37		25	50	.515		1.37	0.71	
0	22.0	1	1.33		15	44	.359		1.33	0.48	1.00
	23.0	1	1.24		20	45	.461		1.24	0.57	
	24.0	1	1.30		25	48	.535		1.30	0.70	
	25.0	1	1.19		15	41	.387		1.19	0.46	.90
	26.0	1	1.12		15	49	.325		1.12	0.36	.85
	27.0	1	1.10		10	48	.230		1.10	0.25	.80
	28.0	1	1.10		0				1.10		.75
	29.0		est				0.1		1.38	0.14	.70
	Rt edge										.65
											.60
											.55
											.50
											.45
											.40
											.35
											.30
											.25
											.20
											.15
											.10
											.05
											.00



Map No. 1

Comp. by RICK

Checked by

DISCHARGE MEASUREMENT NOTES

Sta. No. GC-1
250 M ABOVE BRIDGE OVER SPANITE CK
SILVER LOW BASIN DRAINAGE
Date 4/10/79 19. 92 Party ROMAN NATYLA/RICK NOLL
Width 4.5 Area 2.00 Vel. 0.57 G. H. NONE Disch. 1.08 CFS
Method No. sec. G. H. change in hrs. Susp.

Method coef. Hor. angle coef. Susp. coef. Meter No.
Type of meter PR644
Date rated 4-8-79 for rod, other

GAGE READINGS				
Time	Recorder	Inside	Outside	
<u>042</u>	<u>STATION 1</u>			

Meter ft. above bottom of weight.
Spin before meas. 56 SEC after 30
Meas. plots % diff. from rating
Wading cable, ice, boat upstr downstr., side
bridge 250 + MD feet, mile, above, below
gage, and
Check-bar, found
changed to at
Correct
Levels obtained

Weighted M. G. H.
G. H. correction.
Correct M. G. H.

Measurement rated excellent (2%), Good (5%) fair (8%), poor (over 50%), based on following conditions: Cross section LOW FLOW, NO TURB
Flow Weather OVERCAST RAIN/SNOW
Other Air -3.8 °F @ 2FR
Gage Water °F @
Record removed Intake flushed U
Observer
Control
Remarks
G. H. of zero flow ft.

St. No.	Dist. from initial point	Width	Depth	Observe use depth	Revolutions	Time in seconds	VELOCITY		Adjusted for bar. angle or	Area	Discharge
							At point	Mean in vertical			
RB 2.75		RIGHT BANK									
	9.0	.65	No	Flow							
	8.5	.5	.5		7	57		.146	.25	.04	
	8.0	.5	.7		15	52		.308	.35	.11	
	7.5	.5	.6		40	52		.779	.30	.23	
	7.0	.5	.6		40	51		.793	.30	.24	
	6.5	.5	.55		25	46		.557	.28	.16	
	6.0	.5	.6		25	45		.569	.30	.17	
	5.5	.38	.5		30	46		.664	.19	.13	
LB 5.25	.13	.25						.52	.23	.02	
									2.00	1.08	



Meas. No. 2

Comp. by B. NOLL

Checked by _____

DISCHARGE MEASUREMENT NOTES

Sta. No. GC-2

250 m. BELOW GRANITE CREEK BRIDGE COMBINED FLOW

Date 4 Nov 1951 Party R. MOTYKA & B. NOLL

Width 16.70 Area 27.15 Vel. .40 C. H. None Disch. 10.94

Method _____ No. sec. _____ C. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

Type of meter P.Y.G.M.Y.

Date rated 4-4-74 for rod, other _____

Meter _____ ft. above bottom of weight _____

Spin before meas. 38 SEC. after 3/

Meas. plots _____ % diff. from rating _____

Wading, cable, ice, boat, upstr., downstr., side _____

bridge _____ feet, mile, above, below _____

gage, and _____

Check-bar, found _____

changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 1%), based on following

conditions: Cross section SLOW DEEP POOL, LAMINAR FLOW FEW LARGE ROCKS

Flow _____ Weather OVERCAST, RAINFALLING

Other _____ Air _____ °F@ _____

Gage _____ Water _____ °F@ _____

Record removed _____ Intake flushed U

Observer _____

Control _____

Remarks _____

C. H. of zero flow _____ ft.

River at -

Angle of Sight	Dist. from initial point	Width	Depth	Observe- d from depth	Re- volu- tions	Time in sec- onds	VELOCITY		Adjusted for hor. angle or	Area	Discharge
							At point	Mean in ver- tical			
RB	26.0	.5								0	
	25.0	1	2.0		No flow		0		2.0	0	
	24.0	1	2.0		No flow		0		2.0	0	
	23.0	1	2.0		15	51	.314		2.0	.628	
	22.0	1	2.1		30	46	.664		2.1	1.392	
	21.0	1	2.1		25	46	.557		2.1	1.177	
	20.0	1	2.3		20	40	.575		2.3	1.19	
	19.0	1	2.1		20	35	.502		2.1	.844	
	18.0	1	1.9		20	45	.569		1.9	1.08	
	17.0	1	1.75		15	35	.352		1.75	.616	
	16.0	1	1.7		15	42	.375		1.6	.600	
	15.0	1			20	4	.575		1.55	.798	
	14.0	1			25	45	.582		1.4	.797	
	13.0	1			20	42	.442		1.35	.577	
0	12.0	1	1.2		10	45	.293		1.15	.390	
	11.0	1	1.1		15	42	.375		1.1	.412	
	10.0	.95	1.2		20	40	.316		1.02	.320	
LB	9.0	.35			45		.20		.21	.012	
									<u>27.63</u>	<u>1.11</u>	



Meas. No. 3

Comp. by R. NOLL

Checked by _____

DISCHARGE MEASUREMENT NOTES

Sta. No. 3

SILVER BOW BASIN TUNNEL DRAINAGE - BELOW TRAIL BRIDGE

Date 4 NOV 1971 Party R. MURKA & R. NOLL

Width 13.1 Area 8.65 Vel. .96 C. H. NOUE Disch. 8.71

Method _____ No. sec. _____ C. H. change _____ m _____ hrs. Susp. _____
Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time	Recoverer	Inside	Outside	
0942	STATION # 1			
1033	STATION # 2			
1130	STATION # 3			
Weighted M. C. H. _____				
C. H. correction _____				
Correct M. C. H. _____				

Type of meter PYGM
 Date rated 4-4-77 for rod, other _____
 Meter _____ ft. above bottom of weight.
 Spin before meas. 21, 22 after ?
 Meas. plots _____ % diff. from rating _____
 Wading, cable, ice, boat, upstr., downstr., side
 bridge _____ feet, mile, above, below
 gage, and _____
 Check-bar, found _____
 changed to _____ at _____
 Correct _____
 Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 9%), based on following conditions: Cross section FAST SHALLOW FLOW SOME TURBULENCE

Flow _____ Weather OVERCAST & COOLING
 Other _____ Air _____ °F @ _____
 Gage _____ Water _____ °F @ _____
 Record removed _____ Intake flushed U

Observer _____
 Control _____

Remarks SMALL BRID OFF MAIN LK ENTER JUST ABOVE MEASUREMENT. THIS FLOW ENTERS BETWEEN 2 ROCKS FORMING A UNIFORM DEPTH. ONE FLOW MEASUREMENT WAS TAKEN TO SUBTRACT FROM THE TOTAL FLOW.

River at -

Point	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY		Adjusted for hor. angle or	Area	Discharge
							At point	Mean in vertical			
RB	5.5	.5					.10			.288	.1009
	6.5	1	.35		15	52	.308			.35	.1108
	7.5	1	.40		15	44	.359			.40	.144
	8.5	1	.45		25	41	.622			.45	.280
	9.5	1	.55		30	40	.799			.55	.418
	10.5	1	.70		50	41	1.23			.70	.954
	11.5	1	.70		60	45	1.33			.70	1.20
	12.5	1	.75		70	41	1.68			.95	1.60
	13.5	1	.95		80	45	1.76			.95	1.67
	14.5	1	1.0		40	48	.876			1.0	.876
	15.5	1	.85		40	43	.936			.85	.796
	16.5	1	.90		10	50	.221			.90	.177
	17.5	1.05	.50		25	51	.505			.575	.265
LB	18.6	.55					.20			.137	.027
o										8.15	8.32
MAIN BRAID FROM GOLD CK											
		1.3	.20		20	46	.951			.26	.117
											8.31



Mess. No. 4
 Comp. by R. NOLL
 Checked by

DISCHARGE MEASUREMENT NOTES

Sta. No. GC-4
GOLD CK ABOVE METAL TRAIL BRIDGES ≈ 100 m
 Date 4 NOV 1991 Party RO MDIYKA & R. NOLL
 Width 29.0 Area 281.40 Vel. 5.2 C.H. NONE Disch. 23.34
 Method No. secs. G. H. change in hrs. Susp.

Method coef. Hor. angle coef. Susp. coef. Meter No.
 Type of meter PTM4
 Date rated 4-4-77 for rod, other
 Meter ft. above bottom of weight.
 Spin before meas. 3.4 after 3
 Meas. plots % diff. from rating
 Wading, cable, ice, boat, upstr., downstr., side
 bridge feet, mile, above, below
 gage, and
 Check-bar, found
 changed to at
 Correct
 Levels obtained

GAGE READINGS			
Time	Recorder	Inside	Outside
0947	STATION #1		
1033	STATION #2		
1130	STATION #3		
1230	STATION #4		

Weighted M. G. H.
 G. H. correction
 Correct M. G. H.

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section SLIGHTLY TURBID, SHALLOW SECTION

Flow Weather
 Other Air °F@
 Gage Water °F@
 Record removed Intake flushed ^u.....

Observer
 Control
 Remarks
 C. H. of zero Pow ft

Angle and Point	Dist. from initial point	Width	Depth	Obser- vations depth	Revo- lutions	Time in seconds	VELOCITY		Adjusted for bot. angle or	Area	Discharge
							At point	Mean in ver- tical			
LB	4.0	.5					.10			.15	.015
	5.0	1	.6		15	54	.298			.6	.179
	6.0	1	.4		15	49	.332			.4	.133
	7.0	1	.5		5	54	.116			.5	.058
	8.0	1	.4		25	43	.594			.4	.238
	9.0	1	1.15		15	41	.384			1.15	.442
	10.0	1	1.3		60	47	1.27			1.3	1.65
	11.0	1	1.6		60	46	1.30			1.6	2.08
	12.0	1	1.5		50	41	1.25			1.5	1.88
	13.0	1	1.4		30	46	.664			1.4	.930
	14.0	1	1.3		50	49	1.02			1.3	1.33
	15.0	1	1.1		80	45	1.76			1.1	1.94
	16.0	1	.6		70	42	1.65			.6	.990
	17.0	1	.6		70	42	1.65			.6	.990
0	18.0	1	.75		50	42	1.19			.75	.872
	19.0	1	1.3		30	46	.664			1.3	1.63
	20.0	1	1.3		40	41	.940			1.3	1.27
	21.0	1	1.35		60	46	1.30			1.35	1.76
	22.0	1	1.1		40	40	1.00			1.1	1.10
	23.0	1	1.4		20	42	.492			1.4	.689
	24.0	1	1.2		40	57	.793			1.2	.952
	25.0	1	1.1		20	47	.442			1.1	.496
	26.0	1	1.3		5	58	.098			1.3	.127
	27.0	1	1.35		5	47	.130			1.35	.176
	28.0	1	1.45		3	44	.1097			1.45	.135
	29.0	1	1.3		10	64	.179			1.3	.233
	30.0	1	1.0		40	50	.808			1.0	.904
	31.0	1	1.0		40	47	.858			1.0	.904
	32.0	1	.2		25	42	.608			.2	.122
LB	33.0	.5					.200			.05	.010
										25.40	23.04

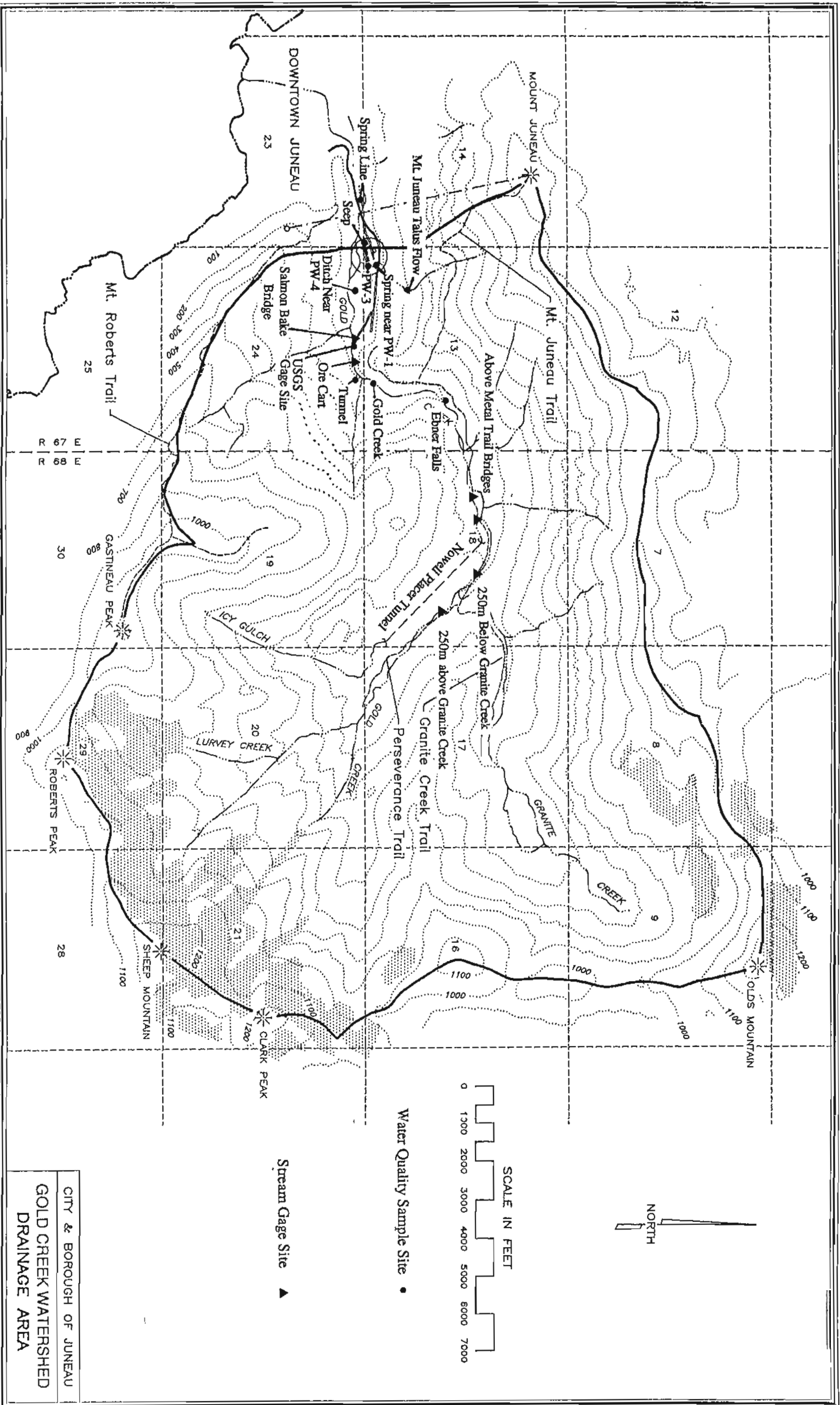


FIGURE-1 SITE LOCATION MAP
 After: CBJ Draft Well-Head Protection Plan, 1992

CITY & BOROUGH OF JUNEAU
 GOLD CREEK WATERSHED
 DRAINAGE AREA

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