

Appendix B

**Well Log and Water Quality Data
(Excerpt from 1993 Study)**

File Copy

FILE COPY

STATE OF ALASKA
VILLAGE SAFE WATER

TUNTUTULIAK, ALASKA
COMMUNITY WATER AND SEWER
FEASIBILITY STUDY
FINAL REPORT

DECEMBER 1993

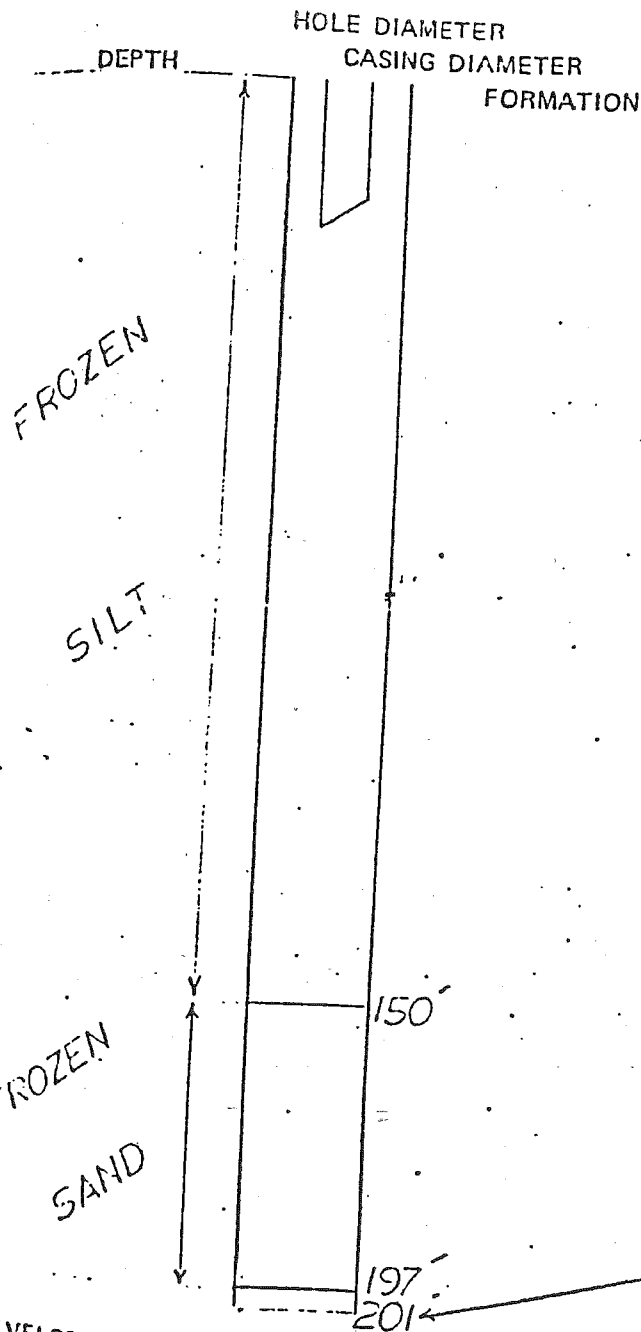
Prepared By:
Eagle River Engineering Services
11940 Business Blvd., Suite 205
Eagle River, AK 99577
(907) 694-5195

FILE COPY

FILE COPY

U.S. PUBLIC HEALTH SERVICE, DIVISION OF INDIAN HEALTH

LOCATION TUITATULIAK DATE STARTED 7/8/79
 DATE COMPLETED 7/23/79 DRILLER ST ANTHONY
 TOTAL DEPTH OF WELL 201 FT. CASING INSTALLED 197 DIAMETER 6"
 GROUT 12' SCREEN SIZE 6" .010 MFG. JOHNSON LENGTH 5'9"
 STATIC WATER LEVEL 8' HRS. PUMPED 24 @ 10 GPM DRAWDOWN 62'



SOIL DATA TO 15 FT.
 FEET THAWED 2'
 BOTTOM OF FROST & MATERIAL _____
 SEASONAL OR PERMA FROST _____

WATER DATA FIELD TEST
 TASTE GOOD
 APPEARANCE FRESH
 AFTER 24 HOURS _____
 IRON _____
 CHLORIDES _____
 TDS _____

PUMP TEST 8' - STATIC LEVEL
 PUMPING LEVEL 62' @ 10 GPM
 AFTER 24 HRS.

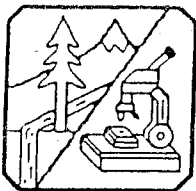
HIGHEST RECOMMENDED PUMP RATE
 WILL STATIC LEVEL CHANGE WITH
 TIDES NO OR FROST NO

BOTTOM OF SCREEN

DEVELOP PROCEDURE SURGE BLOCK

ESTIMATED MAN HOURS FOR DRILLING _____ HOURS FOR TOTAL JOB _____

BY ST. ANTHONY / FOWLER



NORTHERN TESTING LABORATORIES, INC.

3330 INDUSTRIAL AVENUE
2505 FAIRBANKS STREET

FAIRBANKS, ALASKA 99701
ANCHORAGE, ALASKA 99503

(907) 456-3116 • FAX 456-3125
(907) 277-8378 • FAX 274-9645

Eagle River Engineering
P.O. Box 773294
Eagle River AK 99577

Report Date: 07/08/93

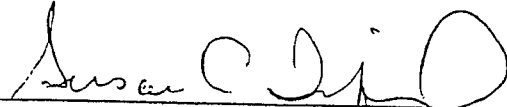
Date Arrived: 06/17/93
Date Sampled: 06/16/93
Time Sampled: 1254
Collected By: LB

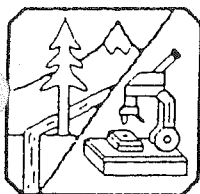
Attn: Louis Butera

Our Lab #: A124182
Location/Project: Tuntutatulialak
Your Sample ID: Washeteria
Sample Matrix: Water
Comments: SAMPLED AFTER WELL FLOW TESTING

* Definitions *
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Estimated Value
M = Matrix Interference
D = Lost to Dilution
MDL = Method Detection Limit

Lab Number	Method	Parameter	Units	Result	*	MDL	Date Prepared	Date Analyzed
A124182	EPA 110.2	Color, Apparent	Unit	110	H	5		06/18/93
A124182	EPA 150.1	pH	Unit	7.8				06/18/93
A124182	EPA 160.1	Total Dissolved Solids	mg/l	290		1		06/18/93
A124182	EPA 170.1	Temperature	Deg F	20.0				06/24/93
A124182	EPA 215.2	Calcium as CaCO3	mg/l	150		0.5		06/24/93
A124182	EPA 310.1	Alkalinity as CaCO3	mg/l	240		1		06/24/93
A124182	EPA 340.2	Fluoride	mg/l	<MDL		0.4		06/28/93
A124182	EPA 353.3	Nitrate-N	mg/L	<MDL		0.1		06/22/93
A124182	EPA 354.1	Nitrite	mg/l	<MDL		0.1		06/18/93
A124182	SM203	Corrosivity		0.9				06/28/93


Reported By: Susan C. Tifental
Microbiology Supervisor



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907-277-8378

Eagle River Engineering Service
PO Box 773294
Eagle River AK 99577

Attn: Louis Butera

Report Date: 07/06/93

Date Arrived: 06/21/93

Date Sampled: 06/16/93

Time Sampled: 1254

Collected By: LB

MDL = Method Detection
Limit

Our Lab #: F125328
Location/Project: A123182
Your Sample ID: Washeteria Tuntutatuliak
Sample Matrix: Water
Comments:

* Flag Definitions
B = Below Regulatory Min.
H = Above Regulatory Max.

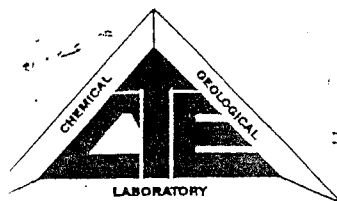
Method	Parameter	Units	Results *	MDL	Date Prepared	Date Analyzed
EPA 200.7	Aluminum	mg/l	<MDL	0.003		06/24/93
	Barium	mg/l	0.461	0.001		06/22/93
	Copper	mg/l	0.007	0.006		06/25/93
	Iron	mg/l	5.18 H	0.003		06/25/93
	Manganese	mg/l	0.070 H	0.001		06/28/93
	Sodium	mg/l	10.7	0.070		06/24/93
	Zinc	mg/l	<MDL	0.009		06/24/93
EPA 206.2	Arsenic	mg/l	0.040	0.005		06/25/93
EPA 213.2	Cadmium	mg/l	<MDL	0.0001		06/28/93
EPA 218.2	Chromium	mg/l	<MDL	0.001		06/26/93
EPA 245.1	Mercury	mg/l	<MDL	0.0002		06/22/93
EPA 270.2	Selenium	mg/l	<MDL	0.002		07/02/93
EPA 272.2	Silver	mg/l	<MDL	0.0001		06/23/93
EPA 300.0	Chloride	mg/l	6.44	1.20		06/28/93
	Sulfate	mg/l	<MDL	0.13		06/30/93

Patricia A. Woody
Reported By: Patricia A. Woody
Senior Chemist

CHEMICAL & GEOLOGICAL LABORATORY

A DIVISION OF COMMERCIAL TESTING & ENGINEERING CO.

5633 B STREET ANCHORAGE, ALASKA 99518 TELEPHONE (907) 562-2343 FAX: (907) 561-5301



REPORT of ANALYSIS

Chemlab Ref.# :93.1369-1
Client Sample ID :TUNTULIAK WASHETERIA
Matrix : WATER

Client Name :EAGLE RIVER ENGINEERING
Ordered By :LOU BUTERA
Project Name :
Project# :
PWSID :UA

Collected :04/01/93 @ 11:49 hrs.
Received :04/02/93 @ 12:15 hrs.
WORK Order :64618
Report Completed :
Technical Director :STEPHEN C. EDE
Released By : *[Signature]*

Sample ROUTINE SAMPLE COLLECTED BY: L. BUTERA. SPECIAL SAMPLE.
Remarks:

Parameter	Results	QC Qual.	Units	Method	Allowable Limits	Extract Date	Analysis Date	Init
INORGANIC CHEMICALS/TITLE 18	n/a		n/a	ASTM/EPA	n/a			
ARSENIC	0.005	U	mg/l	ASTM D2972/EPA 206.2	0.05 maximum	04/07/93	04/07/93	BMW
BARIUM	0.32		mg/l	EPA 200.7	1.0 maximum	04/06/93	04/07/93	DFL
CADMIUM	0.0050	U	mg/l	EPA 213.2	0.010 maximum	04/06/93	04/08/93	KAW
CHROMIUM	0.0050	U	mg/l	EPA 218.2	0.05 maximum	04/06/93	04/06/93	KAW
FLUORIDE	0.069		mg/l	SM16 413E	4.0 maximum	04/06/93	04/06/93	CMR
LEAD	0.0050	U	mg/l	EPA 239.2	0.05 maximum	04/06/93	04/06/93	KAW
MERCURY	0.0002	U	mg/l	SM14 301AVI	0.002 maximum	04/06/93	04/06/93	KAW
NITRATE-N	0.10		mg/l	EPA 353.2/300.0	10 maximum		04/07/93	LIH
SELENIUM	0.005	U	mg/l	ASTM D3859/EPA 270.2	0.01 maximum	04/07/93	04/08/93	BMW
SILVER	0.0010	U	mg/l	EPA 272.2	0.05 maximum	04/06/93	04/07/93	KAW
TURBIDITY	0.40		NTU	EPA 180.1	1.0 maximum		04/02/93	MCE

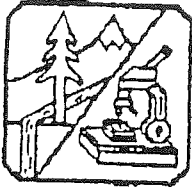
* See Special Instructions Above
** See Sample Remarks Above
U - Undetected, Reported value is the practical quantification limit.
D - Secondary dilution.

UA - Unavailable
NA - Not Analyzed
LT - Less Than
GT - Greater Than

D-4



Member of the SGS Group (Société Générale de Surveillance)



NORTHERN TESTING LABORATORIES, INC.

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(907) 277-8378 • FAX 274-8846

Yukon Kuskokwim Health Corporation
P.O. Box 528
Bethel AK 99559

Report Date: 11/25/91

Date Arrived: 11/14/91
Date Sampled: 11/12/91
Time Sampled: 1510
Collected By: WW

Attn: Wally Wallace

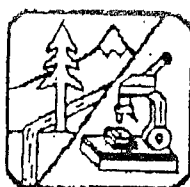
Definitions
MDL = Method Detection
Limit
B = Below Regulatory Min.
H = Above Regulatory Max.
E = Below Detection Limit
Estimated Value

Our Lab #: A115285
Location/Project: Tuntutuliak
Your Sample ID: Well Sample
Sample Matrix: Water
Comments: WASHIETERIA

Lab Number	Method	Parameter	Units	Result	Flag	Date MDL Analyzed
A115285	EPA 200.7	Barium	mg/l	0.319		0.002 11/18/91
A115285	EPA 206.2	Arsenic	mg/l	0.005		0.001 11/18/91
A115285	EPA 212.2	Cadmium	mg/l	<MDL		0.0001 11/18/91
A115285	EPA 218.2	Chromium	mg/l	<MDL		0.001 11/19/91
A115285	EPA 239.2	Lead	mg/l	<MDL		0.001 11/20/91
A115285	EPA 245.1	Mercury	mg/l	<MDL		0.0002 11/20/91
A115285	EPA 270.2	Selenium	mg/l	<MDL		0.002 11/21/91
A115285	EPA 272.2	Silver	mg/l	0.0007		0.0002 11/18/91
A115285	EPA 340.2	Fluoride	mg/l	<MDL		0.5 11/19/91
A115285	EPA 353.3	Nitrate-N	mg/l	<MDL		0.1 11/18/91
A115285	EPA 502.2	Benzene	ug/l	<MDL		0.2 11/18/91
		Bromobenzene	ug/l	<MDL		0.3
		Bromochloromethane	ug/l	<MDL		0.3
		Bromodichloromethane	ug/l	<MDL		0.2
		Bromoform	ug/l	<MDL		1.0
		Bromomethane	ug/l	<MDL		2.0
		n-Butylbenzene	ug/l	<MDL		0.3
		sec-Butylbenzene	ug/l	<MDL		0.3
		tert-Butylbenzene	ug/l	<MDL		0.5
		Carbon Tetrachloride	ug/l	<MDL		0.2
		Chlorobenzene	ug/l	<MDL		0.2

William E. Buchan

Reported By: William E. Buchan
Page Operations Manager



NORTHERN TESTING LABORATORIES, INC.

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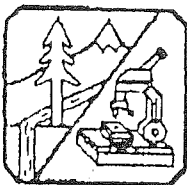
FAIRBANKS, ALASKA 99701
ANCHORAGE, ALASKA 99503

(907) 456-3118 • FAX 456-3125
(907) 277-6378 • FAX 274-6848

Lab Number Method	Parameter	Units	Result Flag	Date MDL Analyzed
A115285 EPA 502.2	Dibromochloromethane	ug/l	<MDL	0.4 11/18/91
	Chloroethane	ug/l	<MDL	2.0
	Chloroform	ug/l	<MDL	0.2
	Chloromethane	ug/l	<MDL	2.0
	o-Chlorotoluene	ug/l	<MDL	0.3
	p-Chlorotoluene	ug/l	<MDL	0.2
	1,2-Dibromo-3-Chloropropane	ug/l	<MDL	2.0
	Dibromomethane	ug/l	<MDL	0.4
	1,4-Dichlorobenzene	ug/l	<MDL	0.2
	m-Dichlorobenzene	ug/l	<MDL	0.2
	o-Dichlorobenzene	ug/l	<MDL	0.2
	Dichlorodifluoromethane	ug/l	<MDL	2.0
	1,1-Dichloroethane	ug/l	<MDL	0.2
	1,2-Dichloroethane	ug/l	<MDL	0.2
	1,1-Dichloroethylene	ug/l	<MDL	1.0
	cis-1,2-Dichloroethylene	ug/l	<MDL	0.2
	trans-1,2-Dichloroethylene	ug/l	<MDL	0.2
	Methylene Chloride	ug/l	<MDL	1.0
	1,2-Dichloropropane	ug/l	<MDL	0.2
	1,3-Dichloropropane	ug/l	<MDL	0.2
	2,2-Dichloropropane	ug/l	<MDL	1.0
	1,1-Dichloropropene	ug/l	<MDL	0.5
	1,3-Dichloropropene	ug/l	<MDL	0.2
	Ethylbenzene	ug/l	<MDL	0.2
	1,2-Dibromoethane	ug/l	<MDL	1.0
	Trichlorofluoromethane	ug/l	<MDL	0.5
	Hexachlorobutadiene	ug/l	<MDL	0.3
	Isopropylbenzene	ug/l	<MDL	0.3
	p-Isopropyltoluene	ug/l	<MDL	0.3
	Naphthalene	ug/l	<MDL	0.3
	n-Propylbenzene	ug/l	<MDL	0.3

William E. Buchanan

Reported By: William E. Buchanan
Anchorage Operations Manager



NORTHERN TESTING LABORATORIES, INC.

3330 INDUSTRIAL AVENUE
2505 FAIRBANKS STREET

FAIRBANKS, ALASKA 99701
ANCHORAGE, ALASKA 99503

(907) 456-3115 • FAX 456-3125
(907) 877-8378 • FAX 274-0645

Lab	Number	Method	Parameter	Units	Result Flag	Date
						MDL Analyzed
A115285	EPA	502.2	Styrene	ug/l	<MDL	0.2 11/18/91
			1,1,1,2-Tetrachloroethane	ug/l	<MDL	0.2
			1,1,2,2-Tetrachloroethane	ug/l	<MDL	0.3
			Tetrachloroethylene	ug/l	<MDL	0.2
			Total Trihalomethane	ug/l	<MDL	2
			Toluene	ug/l	<MDL	0.3
			1,2,3-Trichlorobenzene	ug/l	<MDL	0.3
			1,2,4-Trichlorobenzene	ug/l	<MDL	0.3
			1,1,1-Trichloroethane	ug/l	<MDL	0.2
			1,1,2-Trichloroethane	ug/l	<MDL	0.4
			Trichloroethylene	ug/l	<MDL	0.2
			1,2,3-Trichloropropane	ug/l	<MDL	0.3
			1,2,4-Trimethylbenzene	ug/l	<MDL	0.2
			1,3,5-Trimethylbenzene	ug/l	<MDL	0.2
			Vinyl Chloride	ug/l	<MDL	2.0
			m,p-Xylenes	ug/l	<MDL	0.4
			o-Xylene	ug/l	<MDL	0.2
			Surrogate Spike (Recovery)	%	115.0	

William E. Buchan
Reported By: William E. Buchan
Anchorage Operations Manager



GEOLOGICAL LABORATORY OF ALASKA, INC.

P.O. BOX 4-1276

ANCHORAGE, ALASKA 99509

5633 "B" STREET

TELEPHONE
(907) 275-50

ANALYTICAL REPORT

CUSTOMER Alaska Area Native Health Service SAMPLE LOCATION: Tuntuliak, Alaska

DATE COLLECTED 2-28-79 TIME COLLECTED: ----

COLLECTED BY ---- SOURCE Water Well

MARKS -----

FOR LAB USE ONLY
REC'D BY RY LAB # 9851-1

DATE RECEIVED 3-5-79

DATE COMPLETED 3-8-79

DATE REPORTED 3-8-79

SIGNED Archie L. Huen

mg/l		mg/l		mg/l	
Ag, Silver	<0.05	[] P, Phosphorous	1.7	[] Cyanide	
Al, Aluminum	0.3	[] Pb, Lead	<0.05	[] Sulfate	<1
As, Arsenic	0.2	[] Pt, Platinum	<0.1	[] Phenol	
Au, Gold	<0.1	[] Sb, Antimony	<0.1	[] Total Dissolved Solids	.250
B, Boron	<0.1	[] Se, Selenium	<0.1	[] Total Volatile Solids	
Ba, Barium	0.6	[] Si, Silicon	17	[] Suspended Solids	
Bi, Bismuth	<0.1	[] Sn, Tin	0.7	[] Volatile Suspended Solids	
Ca, Calcium	51	[] Sr, Strontium	0.3	[] Hardness as CaCO ₃	270
Cd, Cadmium	<0.01	[] Ti, Titanium	<0.1	[] Alkalinity as CaCO ₃	240
Co, Cobalt	<0.05	[] W, Tungsten	<0.1	[]	
Cr, Chromium	<0.05	[] V, Vanadium	<0.1	[]	
Cu, Copper	<0.1	[] Zn, Zinc	0.1	[]	
Fe, Iron	50	[] Zr, Zirconium	<0.1	[]	
Hg, Mercury	<0.1	[] Ammonia		[] mmhos Conductivity	390
K, Potassium	1	[] Nitrogen-N (Kjedahl)		[] pH Units	6.7
Mg, Magnesium	9.9	[] Nitrogen-N (Nitrate-N)		[] Turbidity NTU	
Mn, Manganese	0.53	[] Nitrite-N		[] Color Units	
Mo, Molybdenum	<0.05	[] Phosphorus (Ortho)-P		[] T. Coliform/100ml	
Na, Sodium	7	[] Chloride	12	[]	
Ni, Nickel	<0.1	[] Fluoride		[]	

CHEMICAL & GEOLOGICAL LABORATORIES OF ALASKA, INC.

TELEPHONE
(207) 270-4014

P.O. BOX 4-1276

ANCHORAGE, ALASKA 99509

5633 "B" STREET

ANALYTICAL REPORT

FOR Alaska Area Native Health Service SAMPLE LOCATION: Tuntutuliak, Alaska

COLLECTED ---- TIME COLLECTED: ----

ED BY S. St. Anthony SOURCE Well #7-23-79

ERS ----

FOR LAB USE ONLY	
RECVD. BY SE	LAB #1170
DATE RECEIVED	8-2-79
DATE COMPLETED	8-3-79
DATE REPORTED	8-6-79
SIGNED <i>Archie L. Green</i>	

	mg/l		mg/l		mg/l
Ag, Silver	<0.05	[] P, Phosphorous	0.6	[] Cyanide	
Al, Aluminum	<0.05	[] Pb, Lead	<0.05	[] Sulfate	<3
As, Arsenic	<0.1	[] Pt, Platinum	<0.1	[] Phenol	
Au, Gold	<0.01	[] Sb, Antimony	<0.01	[] Total Dissolved Solids	205
B, Boron	0.02	[] Se, Selenium	<0.1	[] Total Volatile Solids	
Ba, Barium	0.3	[] Si, Silicon	14	[] Suspended Solids	
Bi, Bismuth	<0.05	[] Sn, Tin	<0.1	[] Volatile Suspended Solids	
Ca, Calcium	41	[] Sr, Strontium	0.2	[] Hardness as CaCO ₃	168
Cd, Cadmium	<0.01	[] Ti, Titanium	<0.05	[] Alkalinity as CaCO ₃	188
Co, Cobalt	<0.05	[] W, Tungsten	<0.05	[]	
Cr, Chromium	<0.05	[] V, Vanadium	<0.05	[]	
Cu, Copper	<0.05	[] Zn, Zinc	0.11	[]	
Fe, Iron	2.4	[] Zr, Zirconium	<0.05	[]	
Hg, Mercury	<0.1	[] Ammonia Nitrogen-N		[] mmhos Conductivity	360
K, Potassium	1.1	[] Kjeldahl Nitrogen-N		[] pH Units	6.7
Mg, Magnesium	15	[] Nitrate-N		[] Turbidity NTU	
Mn, Manganese	0.05	[] Nitrite-N		[] Color Units	
Mo, Molybdenum	<0.05	[] Phosphorus (Ortho)-P		[] T. Coliform/100ml	
Na, Sodium	7.5	[] Chloride	10	[]	
Ni, Nickel	<0.05	[] Fluoride		[]	D-16



ANALYTICAL REPORT

Water Analysis(Facility) B.I.A. Water Well at Tuntatuliak

Date Collected: 4-21-72 Time Collected: —

Source of Sample: Well drilled 12/64 by B.I.A. By: August Alexie

Physical Observations, Remarks: clear when collected

☐ <u>—</u> mg/l Aluminum	☐ <u>452</u> mmhos Conductivity	☐ <u>189</u> mg/l Hardness as CaCO ₃
☐ <u>—</u> mg/l Arsenic	☐ <u>7.2</u> units pH	☐ <u>212</u> mg/l Alkalinity as CaCO ₃
☐ <u>—</u> mg/l Barium	☐ <u>—</u> mg/l Ammonia Nitrogen-N	☐ <u>—</u> mg/l Acidity-T as CaCO ₃
☐ <u>—</u> mg/l Boron	☐ <u>—</u> mg/l Kjeldahl Nitrogen-N	☐ <u>—</u> mg/l Acidity Free as CaCO ₃
☐ <u>—</u> mg/l Cadmium	☐ <u>—</u> mg/l Organic Nitrogen-N	☐ <u>—</u> /100ml Coliform-T
☐ <u>46.</u> mg/l Calcium	☐ <u>.4</u> mg/l Nitrate(N)	☐ <u>—</u> /100ml Coliform-F
☐ <u>—</u> mg/l Copper	☐ <u>—</u> mg/l Nitrite(N)	☐ <u>—</u> /100ml Strep-F
☐ <u>—</u> mg/l Chromium-Total	☐ <u>—</u> mg/l Phosphorus (Ortho)-P	☐ <u>—</u> units Color
☐ <u>—</u> mg/l Chromium-Tri	☐ <u>—</u> mg/l Phosphorus (Total)-P	☐ <u>—</u> <u>—</u> <u>—</u>
☐ <u>—</u> mg/l Chromium-Hex	☐ <u>7.0</u> mg/l Chloride	☐ <u>—</u> <u>—</u> <u>—</u>
☐ <u>17.</u> mg/l Iron-Total	☐ <u>.2</u> mg/l Fluoride	
☐ <u>—</u> mg/l Iron-Dissolved	☐ <u>—</u> mg/l Cyanide	
☐ <u>—</u> mg/l Lead	☐ <u>.8</u> mg/l Sulfate	
☐ <u>18.</u> mg/l Magnesium	☐ <u>—</u> mg/l Phenol	
☐ <u>.46</u> mg/l Manganese	☐ <u>—</u> mg/l MBSA	
☐ <u>—</u> mg/l Mercury	☐ <u>—</u> mg/l BOD	
☐ <u>—</u> mg/l Nickel	☐ <u>—</u> mg/l COD	
☐ <u>2.4</u> mg/l Potassium	☐ <u>247</u> mg/l TD Solids	
☐ <u>13</u> mg/l Selenium	☐ <u>—</u> mg/l TV Solids	
☐ <u>—</u> mg/l Sodium	☐ <u>—</u> mg/l Suspended Solids	
☐ <u>—</u> mg/l Silver	☐ <u>—</u> mg/l SV Solids	
☐ <u>—</u> mg/l Zinc	☐ <u>—</u> JTU Turbidity	

Transported by: —
Received by: —
Transported by: —
Received by: —

FOR LAB USE ONLY
Lab# — Rec'd by: —
Date sample rec'd: —
Date analysis completed: —
Date results reported: —
Signed: —
Date: — D-17