



RESULTS OF ANALYSIS - Water

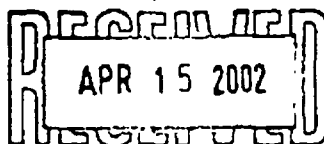
File No. G9174

		Red Bluff C.S. 97 02 10	<i>Summed</i> Nazko Bad Ofc Well 97 02 10	Nazko C.S. <i>weaver</i> 97 02 10
Physical Tests				
Colour	(CU)	<5	<5	<5
Conductivity	(umhos/cm)	665	527	507
Total Dissolved Solids		957	266	290
Hardness	CaCO3	958	290	250
pH		8.24	7.83	7.98
Turbidity	(NTU)	0.8	1.0	0.2
Dissolved Anions				
Alkalinity-Total	CaCO3	395	250	296
Chloride	Cl	1.1	3.3	0.8
Fluoride	F	0.30	0.04	0.21
Sulphate	SO4	6	50	4
Nutrients				
Nitrate Nitrogen	N	<0.005	<0.005	0.009
Nitrite Nitrogen	N	0.001	0.001	0.002
Total Metals				
Aluminium	T-Al	<0.2	<0.2	<0.2
Arsenic	T-As	0.0091	0.0013	0.0259
Barium	T-Ba	0.04	0.19	0.11
Boron	T-B	<0.1	<0.1	<0.1
Cadmium	T-Cd	<0.0002	<0.0002	<0.0002
Calcium	T-Ca	92.0	77.5	42.4
Chromium	T-Cr	<0.01	<0.01	<0.01
Copper	T-Cu	0.01	<0.01	0.01
Iron	T-Fe	0.04	0.15	<0.03
Lead	T-Pb	<0.001	<0.001	<0.001
Magnesium	T-Mg	67.5	23.4	34.9
Manganese	T-Mn	0.052	0.455	0.896
Mercury	T-Hg	<0.00005	<0.00005	<0.00005
Potassium	T-K	6	<2	5
Selenium	T-Se	<0.0005	<0.0005	<0.0005
Sodium	T-Na	14	5	18
Zinc	T-Zn	0.135	<0.005	<0.005

Remarks regarding the analyses appear at the beginning of this report.
 Results are expressed as milligrams per litre except for pH, Colour (CU),
 Conductivity (umhos/cm), and Turbidity (NTU).
 < = Less than the detection limit indicated.
 This result has been confirmed.



ANALYTICAL SERVICES

25-Mar-02
Page 1 of 11

Certificate of Analysis

8577 Commerce Court
Burnaby, B.C.
Canada V5A 4N5
Tel 604 444 4808
Fax 604 444 4511Reported To :

HEALTH CANADA

Client Code FC

220 - 177 VICTORIA STREET
PRINCE GEORGE, BC
V2L 5R8Phone : (250) 561-5384
FAX : (250) 564-3272Project Information :Project ID : NAZKO - HEALTH CLINIC
Submitted By: C VON SCHILLINGRequisition Forms :

Form 08099062 logged on 11-Mar-02 completed on 23-Mar-02

Remarks :

- + All organic data is blank corrected except for PCDD/F, Hi-res MS and CLP volatile analyses
- + 'MDL' = Method Detection Limit. '<' = Less than MDL. '---' = Not analyzed
- + 'CDWG' = Canadian Drinking Water Guidelines
- + Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- + Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- + All Groundwater samples except BTEX/VOC's or Purgeable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- + This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: James Teshima

for
Heaton Heath



ANALYTICAL SERVICES

25-Mar-02

Page 2 of 11

ANALYTICAL REPORT
Form 08099062

Client : HEALTH CANADA
Project : NAZKO - HEALTH CLINIC
Sampling site :
Submitted by : C VON SCHILLING

Philip ID : 12013374
Client ID : NAZKO

Sparcode	Parameter	Unit	MDL	CDWG	
PHYSICAL					
00041220	pH	pH units	0.1	6.5-8.5	7.8
00021300	Color True	Col.Unit	5	15	120
00111160	Specific Conductance	uS/cm	1	---	446
SCCASCALC	Computed Conductance	uS/cm		---	540
CCPDCALC	Conductance % Diff.	%		---	19.1
00081071	Residue Nonfilterable (TSS)	mg/L	4	---	7
007H1035	Residue Filterable 1.0u (TDS)	mg/L	10	500	292
CTDSCALC	Computed TDS	mg/L		---	262
TDSRCALC	TDS % Diff.	%		---	-10.6
00151140	Turbidity	NTU	0.10	1.0	14.2
0107CALC	Hardness Total -T	mg/L		500	255
GENERAL INORGANICS					
01011211	Alkalinity Phen. 8.3 as CaCO3	mg/L	1	---	< 1
01021210	Alkalinity Total as CaCO3	mg/L	1	---	270
CO3-CALC	Carbonate as CO3 =	mg/L		---	< 0.5
HCO3CALC	Bicarbonate as HCO3-	mg/L		---	329
OH--CALC	Hydroxide as OH-	mg/L		---	< 0.5
2105AAD4	Cyanide(SAD) + Thiocyanate	mg/L	0.0005	0.2	< 0.0005
0125LLHS	Sulfide Total	mg/L	0.005	0.05	< 0.005
ANIONS					
11041334	Chloride Dissolved	mg/L	0.3	< 250	0.9
11061341	Fluoride Dissolved	mg/L	0.01	1.5	0.19
IonBCALC	Ion Balance	%		---	4.8
AnnsCALC	Total Anions	meq/L		---	5.45
CnsCALC	Total Cations	meq/L		---	6.00
LangCALC	Langelier Index	pH units		---	0.4
pHSACALC	Saturation pH	pH units		---	7.4
CARBON					
01030912	Organic Carbon - Total	mg/L	0.5	---	11.1

Matrix : Water
Sampled on: 02/03/08 11:30

CONTINUED on page 3



ANALYTICAL SERVICES

25-Mar-02
Page 3 of 11ANALYTICAL REPORT
Form 08099062Client : HEALTH CANADA
Project : NAZKO - HEALTH CLINIC
Sampling site :
Submitted by : C VON SCHILLINGPhillp ID : 12013374
Client ID : NAZKO

Sparcode	Parameter	Unit	MDL	CDWG	
NITROGEN					
11081351	Ammonia Nitrogen (N)	mg/L	0.005	---	0.773
1110CALC	Nitrate Nitrogen Dissolved (N)	mg/L		10.0	0.02
11091350	Nitrate + Nitrite (N)	mg/L	0.02	10.0	0.05
11111354	Nitrite Nitrogen (N)	mg/L	0.005	1.0	0.027
SULFATE					
11211405	Sulfate	mg/L	0.5	< 500	0.6
METALS TOTAL					
Al-T0031	Aluminium	mg/L	0.02	---	< 0.02
Sb-TMS31	Antimony	mg/L	0.001	---	< 0.001
As-TMS31	Arsenic	mg/L	0.001	0.025	0.003
Ba-T0031	Barium	mg/L	0.001	1.0	0.034
B--T0031	Boron	mg/L	0.008	5.0	< 0.008
Cd-TMS31	Cadmium	mg/L	0.0001	0.005	< 0.0001
Ca-T0031	Calcium	mg/L	0.05	---	46.5
Cr-T0031	Chromium	mg/L	0.005	0.05	< 0.005
Co-T0031	Cobalt	mg/L	0.005	---	< 0.005
Cu-T0031	Copper	mg/L	0.005	1.0	0.013
Fe-T0031	Iron	mg/L	0.005	0.3	5.04
Pb-TMS31	Lead	mg/L	0.0005	0.01	0.0005
Mg-T0031	Magnesium	mg/L	0.05	---	33.7
Mn-T0031	Manganese	mg/L	0.001	0.05	0.880
Hg-T0310	Mercury	mg/L	0.00005	0.001	< 0.00005
Mo-T0031	Molybdenum	mg/L	0.005	---	< 0.005
Ni-T0031	Nickel	mg/L	0.008	---	0.011
K_T0031	Potassium	mg/L	1	---	7
Se-TMS31	Selenium	mg/L	0.001	0.01	< 0.001
Ag-T0031	Silver	mg/L	0.01	---	< 0.01
Na_T0031	Sodium	mg/L	0.05	200	11.5
U--TLLMS	Uranium	mg/L	0.00001	0.1	< 0.00001
V--T0031	Vanadium	mg/L	0.005	---	< 0.005
Zn-T0031	Zinc	mg/L	0.005	5.0	< 0.005

Matrix : Water
Sampled on: 02/03/08 11:30

CONTINUED on page 4



ANALYTICAL SERVICES

25-Mar-02
Page 4 of 11

ANALYTICAL REPORT
Form 08099062

Client : HEALTH CANADA
Project : NAZKO - HEALTH CLINIC
Sampling site :
Submitted by : C VON SCHILLING

Phillip ID : 12013374
Client ID : NAZKO

Sparcode	Parameter	Unit	MDL	CDWG
CHLORINATED PHENOLS				
EX9946Z7	Water Prep for CPs	date		02/03/12
MCP2CPWA	2-chlorophenol	mg/L	0.001	< 0.001
MCP3CPWA	3-chlorophenol	mg/L	0.001	< 0.001
MCP4CPWA	4-chlorophenol	mg/L	0.001	< 0.001
CPE1CPWA	2,3-Dichlorophenol	mg/L	0.0001	< 0.0001
CPH1CPWA	2,4 + 3,4-DiClPhenol	mg/L	0.0001	< 0.0001
CPH2CPWA	2,5-Dichlorophenol	mg/L	0.0001	< 0.0001
CP09CPWA	2,6-Dichlorophenol	mg/L	0.0001	< 0.0001
CPE3CPWA	3,5-Dichlorophenol	mg/L	0.0001	< 0.0001
CP03CPWA	2,3,4-Trichlorophenol	mg/L	0.0001	< 0.0001
CP04CPWA	2,3,5-Trichlorophenol	mg/L	0.0001	< 0.0001
CP05CPWA	2,3,6-Trichlorophenol	mg/L	0.0001	< 0.0001
CP06CPWA	2,4,5-Trichlorophenol	mg/L	0.0001	< 0.0001
CP07CPWA	2,4,6-Trichlorophenol	mg/L	0.0001	< 0.0001
CP44CPWA	3,4,5-Trichlorophenol	mg/L	0.0001	< 0.0001
CP02CPWA	2,3,4,5-Tetrachlorophenol	mg/L	0.0001	< 0.0001
CP01CPWA	2346 + 2356-TeClPhenol	mg/L	0.0001	< 0.0001
P022CPWA	Pentachlorophenol	mg/L	0.0001	< 0.0001
SURROGATE RECOVERY				
DC01SURR	CL2 Phenylaceticacid	%		89
BR3-CPWA	Tribromophenol	%	40	96
HERBICIDES				
EX995351	Prep for Glyphosate	date		02/03/12
A001P012	AMPA	mg/L	0.05	< 0.05
HYDROCARBONS				
H099PT11	VH C6-C10	mg/L	0.1	< 0.1
EX995172	Volat. Wat. Pre-Scr.	date		02/03/12
H097CALC	VPHw	mg/L		< 0.1

Matrix : Water
Sampled on: 02/03/08 11:30

CONTINUED on page 5



ANALYTICAL SERVICES

25-Mar-02
Page 5 of 11ANALYTICAL REPORT
Form 08099062Client : HEALTH CANADA
Project : NAZKO - HEALTH CLINIC
Sampling site :
Submitted by : C VON SCHILLINGPhilip ID : 12013374
Client ID : NAZKO

Sparcode	Parameter	Unit	MDL	CDWG	
POLYCYCLIC AROMATIC HYDROCARBONS					
EX9946Z4	PAH Extraction-Water	date			02/03/13
PA05MW02	Benzo(a)pyrene	mg/L	0.00001	0.00001	< 0.00001
VOLATILE ORGANICS-MAH					
B020MS11	Benzene	ug/L	0.5	5.0	< 0.5
V919MS11	Chlorobenzene	ug/L	0.5	80.0	< 0.5
V924MS11	1,2-Dichlorobenzene	ug/L	0.5	200.0	< 0.5
V925MS11	1,3-Dichlorobenzene	ug/L	0.3	---	< 0.3
V926MS11	1,4-Dichlorobenzene	ug/L	0.4	5.0	< 0.4
B021MS11	Ethylbenzene	ug/L	0.5	---	< 0.5
V921MS11	Styrene	ug/L	0.4	---	< 0.4
T001MS11	Toluene	ug/L	0.5	24.0	< 0.5
X_8842_5	Xylenes	ug/L	0.5	300.0	< 0.5
X003MS11	m,p - Xylene	ug/L	0.5	---	< 0.5
X002MS11	o - Xylene	ug/L	0.5	---	< 0.5
MTBEMS11	Methyl t-butyl ether	ug/L	5	---	< 5
VOLATILE ORGANICS-CHLORINATED ALIPHATIC					
V903MS11	Bromomethane	ug/L	3	---	< 3
C034MS11	Carbon tetrachloride	ug/L	1	---	< 1
V904MS11	Chloroethane	ug/L	4	---	< 4
V914MS11	2-chloroethylvinylether	ug/L	2	---	< 2
V901MS11	Chloromethane	ug/L	1	---	< 1
V909MS11	1,1-Dichloroethane	ug/L	0.7	---	< 0.7
V912MS11	1,2-Dichloroethane	ug/L	0.5	---	< 0.5
V906MS11	1,1-Dichloroethene	ug/L	0.4	---	< 0.4
V910MS11	cis-1,2-Dichloroethene	ug/L	0.4	---	< 0.4
V908MS11	trans-1,2-Dichloroethene	ug/L	0.7	---	< 0.7
V907MS11	Dichloromethane	ug/L	0.9	---	< 0.9
V913MS11	1,2-Dichloropropane	ug/L	0.5	---	< 0.5
V915MS11	cis-1,3-Dichloropropene	ug/L	0.4	---	< 0.4
V916MS11	trans-1,3-Dichloropropene	ug/L	0.3	---	< 0.3
V918MS11	1,2-Dibromoethane	ug/L	1	---	< 1
V923MS11	1,1,2,2-Tetrachloroethane	ug/L	0.5	---	< 0.5

Matrix : Water
Sampled on: 02/03/08 11:30

CONTINUED on page 6



ANALYTICAL SERVICES

25-Mar-02
Page 6 of 11

ANALYTICAL REPORT
Form 08099062

Client : HEALTH CANADA
Project : NAZKO - HEALTH CLINIC
Sampling site :
Submitted by : C VON SCHILLING

Philip ID : 12013374
Client ID : NAZKO

Sparcode	Parameter	Unit	MDL	CDWG	
T030MS11	Tetrachloroethene	ug/L	0.5	30.0	< 0.5
V911MS11	1,1,1-Trichloroethane	ug/L	0.7	---	< 0.7
V917MS11	1,1,2-Trichloroethane	ug/L	0.5	---	< 0.5
T029MS11	Trichloroethane	ug/L	0.6	50.0	< 0.6
V905MS11	Trichlorofluoromethane	ug/L	4	---	< 4
V902MS11	Vinyl Chloride	ug/L	1	2.0	< 1
VOLATILE ORGANICS-TRihalOMETHANES					
B012MS11	Bromodichloromethane	ug/L	0.5	100.0	< 0.5
B013MS11	Bromoform	ug/L	0.4	100.0	< 0.4
C032MS11	Chloroform	ug/L	0.6	100.0	< 0.6
C033MS11	Dibromochloromethane	ug/L	0.4	100.0	< 0.4
VOC SURROGATE RECOVERY					
VS01VSUR	Bromofluorobenzene	%	0	---	91
VS02VSUR	d4-1,2-dichloroethane	%	0	---	102
VS03VSUR	d8-Toluene	%	0	---	92

Matrix : Water
Sampled on: 02/03/08 11:30



ANALYTICAL SERVICES

25-Mar-02

Page 7 of 11

SPIKE SUMMARY
Form 08099062

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
pH	Blank Spike. Batch :	24400982	< 0.1	6.0	6	pH units	100
Specific Conductance	Blank Spike. Batch :	24400984	< 1	993	1010	uS/cm	98
Residue Nonfilterable (TSS)	Blank Spike. Batch :	24401016	< 4	197	200	mg/L	98
Residue Filterable 1.0u (TDS)	Blank Spike. Batch :	24400991	< 10	98	100	mg/L	90
Turbidity	Blank Spike. Batch :	24401004	< 0.10	1.99	2	NTU	95
Alkalinity Total as CaCO3	Blank Spike. Batch :	24401047	< 1	99	100	mg/L	99
Cyanide(SAD) + Thiocyanate	Blank Spike. Batch :	24100545	< 0.0005	0.0207	.02	mg/L	104
Sulfide Total	Blank Spike. Batch :	24100560	< 0.005	0.098	.1	mg/L	98
Chloride Dissolved	Blank Spike. Batch :	24100529	< 0.5	98.2	100	mg/L	98
Fluoride Dissolved	Blank Spike. Batch :	24100538	< 0.01	0.51	.5	mg/L	102
Organic Carbon - Total	Blank Spike. Batch :	24100528	< 0.5	11.3	10	mg/L	113
Ammonia Nitrogen (N)	Blank Spike. Batch :	24100552	< 0.005	0.175	.2	mg/L	88
Nitrate + Nitrite (N)	Blank Spike. Batch :	24100552	< 0.02	0.59	.6	mg/L	98
Nitrite Nitrogen (N)	Blank Spike. Batch :	24100552	< 0.005	0.194	.2	mg/L	97
Sulfate Dissolved	Blank Spike. Batch :	24100530	< 0.5	98.5	100	mg/L	98
Mercury	Blank Spike. Batch :	24200912	< 0.00005	0.00042	.0005	mg/L	84
Arsenic	Blank Spike. Batch :	24200884	< 0.001	0.020	.02	mg/L	100
Cadmium	Blank Spike. Batch :	24200884	< 0.0001	0.0202	.02	mg/L	101
Lead	Blank Spike. Batch :	24200884	< 0.0005	0.0216	.02	mg/L	108
Selenium	Blank Spike. Batch :	24200884	< 0.001	0.021	.02	mg/L	104
Pentachlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0024	.002	mg/L	119
2346 + 2356-TeClPhenol	Blank Spike. Batch :	24500486	< 0.0001	0.0047	.004	mg/L	117
4-chlorophenol	Blank Spike. Batch :	24500486	< 0.001	0.019	.02	mg/L	93
2,3,4,5-Tetrachlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0022	.002	mg/L	112
2,3,4-Trichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0023	.002	mg/L	113
2,3,5-Trichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0022	.002	mg/L	110
2,3,6-Trichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0023	.002	mg/L	114
2,4,5-Trichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0023	.002	mg/L	113
2,4,6-Trichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0023	.002	mg/L	117
3,4,5-Trichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0026	.002	mg/L	133
2,4 + 3,4-DiClPhenol	Blank Spike. Batch :	24500486	< 0.0001	0.0054	.004	mg/L	135
2,3-Dichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0027	.002	mg/L	136
2,5-Dichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0025	.002	mg/L	126
3,5-Dichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0026	.002	mg/L	128
2,6-Dichlorophenol	Blank Spike. Batch :	24500486	< 0.0001	0.0024	.002	mg/L	119
2-chlorophenol	Blank Spike. Batch :	24500486	< 0.001	0.022	.02	mg/L	108
3-chlorophenol	Blank Spike. Batch :	24500486	< 0.001	0.019	.02	mg/L	96
AMPA	Blank Spike. Batch :	25300122	< 0.05	0.94	1	mg/L	94



ANALYTICAL SERVICES

25-Mar-02
Page 8 of 11SPIKE SUMMARY
Form 08099062

Parameter	Client ID	Philip ID	Sample Conc.	Sample & Spike Conc.	Spike Amount	Unit	Percent Recovery
Benzo(a)pyrene	Blank Spike. Batch :	24500454	< 0.00001	0.0023	.0025	mg/L	93
cis-1,2-Dichloroethene	Blank Spike. Batch :	25201361	< 0.4	9.5	10	ug/L	95
Chloroform	Blank Spike. Batch :	25201361	< 0.6	10	10	ug/L	100
1,1,1-Trichloroethane	Blank Spike. Batch :	25201361	< 0.7	9.7	10	ug/L	97
1,2-Dichloroethane	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	100
Carbon tetrachloride	Blank Spike. Batch :	25201361	< 1	9	10	ug/L	95
Benzene	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	102
1,2-Dichloropropane	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	101
Trichloroethene	Blank Spike. Batch :	25201361	< 0.6	10	10	ug/L	100
Bromodichloromethane	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	101
cis-1,3-Dichloropropene	Blank Spike. Batch :	25201361	< 0.4	9.5	10	ug/L	95
trans-1,3-Dichloropropene	Blank Spike. Batch :	25201361	< 0.3	11	10	ug/L	106
Toluene	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	104
1,1,2-Trichloroethane	Blank Spike. Batch :	25201361	< 0.5	11	10	ug/L	105
Dibromochloromethane	Blank Spike. Batch :	25201361	< 0.4	11	10	ug/L	105
1,2-Dibromoethane	Blank Spike. Batch :	25201361	< 1	10	10	ug/L	104
Tetrachloroethene	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	102
Chlorobenzene	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	100
Ethylbenzene	Blank Spike. Batch :	25201361	< 0.5	11	10	ug/L	106
m,p - Xylene	Blank Spike. Batch :	25201361	< 0.5	22	20	ug/L	108
Bromoform	Blank Spike. Batch :	25201361	< 0.4	8.8	10	ug/L	88
Styrene	Blank Spike. Batch :	25201361	< 0.4	11	10	ug/L	107
o - Xylene	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	103
1,1,1,2-Tetrachloroethane	Blank Spike. Batch :	25201361	< 0.5	10	10	ug/L	103
1,2-Dichlorobenzene	Blank Spike. Batch :	25201361	< 0.5	9.8	10	ug/L	98
1,3-Dichlorobenzene	Blank Spike. Batch :	25201361	< 0.3	9.8	10	ug/L	98
1,4-Dichlorobenzene	Blank Spike. Batch :	25201361	< 0.4	9.6	10	ug/L	96



ANALYTICAL SERVICES

25-Mar-02
Page 9 of 11ANALYSIS DATES
Form 08099062

Philip ID:		12013374
Client ID:		NAZKO
00041220	pH	13-MAR-2002
00021300	Color True	13-MAR-2002
00111160	Specific Conductance	13-MAR-2002
00081071	Residue Nonfilterable (TSS)	15-MAR-2002
007H1035	Residue Filterable 1.0u (TDS)	13-MAR-2002
00151140	Turbidity	15-MAR-2002
01011211	Alkalinity Phen. 8.3 as CaCO3	19-MAR-2002
01021210	Alkalinity Total as CaCO3	19-MAR-2002
2105AA04	Cyanide(SAD) + Thiocyanate	13-MAR-2002
0125LLHS	Sulfide Total	15-MAR-2002
11041334	Chloride Dissolved	12-MAR-2002
11061341	Fluoride Dissolved	12-MAR-2002
TOC-W	15004 Sparg/Ox-Mem Color	12-MAR-2002
11081351	Ammonia Nitrogen (N)	14-MAR-2002
11091350	Nitrate + Nitrite (N)	14-MAR-2002
11111354	Nitrite Nitrogen (N)	14-MAR-2002
11211405	Sulfate	12-MAR-2002
Hg-T0310	Mercury	15-MAR-2002
MET-DWS	Public Metals ICP/HGA	13-MAR-2002
CPWAGCMS	GOLDCPS	22-MAR-2002
DC01SURR	CL2 Phenylaceticacid	22-MAR-2002
A001P012	AMPA	13-MAR-2002
H099PT11	VH C6-C10	13-MAR-2002
PA05MW02	Benzo(a)pyrene	14-MAR-2002
VOC-W1	VOC's P&T GC/MS	13-MAR-2002
VOC-SR	Surrogate Recovery	13-MAR-2002
Matrix:		Water
Sampled on:		8-MAR-2002



ANALYTICAL SERVICES

25-Mar-02
Page 10 of 11

BATCH NUMBERS
Form 08099062

Philip ID:		12013374
Client ID:		NAZKO
<hr/>		
00041220	pH	24400982
00021300	Color True	24100544
00111160	Specific Conductance	24400984
00081071	Residue Nonfilterable (TSS)	24401016
007H1035	Residue Filterable 1.0u (TDS)	24400991
00151140	Turbidity	24401004
01011211	Alkalinity Phen. 8.3 as CaCO3	24401049
01021210	Alkalinity Total as CaCO3	24401047
2105AA04	Cyanide(SAD) + Thiocyanate	24100545
0125LLHS	Sulfide Total	24100560
11041334	Chloride Dissolved	24100529
11061341	Fluoride Dissolved	24100538
TOC-W	15004 Sparg/Ox-Mem Color	24100528
11081351	Ammonia Nitrogen (N)	24100552
11091350	Nitrate + Nitrite (N)	24100552
11111354	Nitrite Nitrogen (N)	24100552
11211405	Sulfate	24100530
Hg-T0310	Mercury	24200912
MET-DWS	Public Metals ICP/HGA	24200884
CPWAGCMS	GOLDCPS	24500486
DC01SURR	CL2 Phenylaceticacid	24500487
A001P012	AMPA	25300122
H099PT11	VH C6-C10	25201362
PA05MW02	Benzo(a)pyrene	24500454
VOC-W1	VOC's P&T GC/MS	25201361
VOC-SR	Surrogate Recovery	25201361
Matrix:		Water
Sampled on:		8-MAR-2002



ANALYTICAL SERVICES

25-Mar-02

Page 11 of 11

BLANK SUMMARY
Form 08099062

All method blanks were less than MDL



PSC ANALYTICAL SERVICES

8577 Commerce Court
Burnaby, B.C. V5A 4N5

Phone: (604) 444-4808
Fax: (604) 444-4511
Toll Free: 1-800-440-4808

ANALYSIS REQUEST 8099062

COMPANY NAME: *Health Canada*

PH. #: *250 561 5378*
FAX #: *250 561 3272*

COMPANY ADDRESS:
*220-177 Victoria St.
Prince George BC
V2L 5R8*

CLIENT PROJECT ID: (R)
*(357) Nazko -
Health Clinic*

SAMPLER NAME (PRINT):
C van Schilling

PROJECT MANAGER:
Susan Kessler

FIELD SAMPLE ID	PSC LAB # (Lab Use Only)	MATRIX				# CONTAINERS	SAMPLING		HEADSPACE VAPOUR	Metals	Sulphide	Benzene-precursor	Chlorinated Phenols	Physically Active Ingredients	Cyanide	VOC	VOC	AMPRA
		GROUND WATER	SURFACE WATER	SOIL	OTHER		DATE	TIME										
<i>1 Nazko 1x250ml</i>	<i>13374</i>	<input checked="" type="checkbox"/>				<i>1</i>	<i>Mar 8/02</i>	<i>11:30</i>		<input checked="" type="checkbox"/>								
<i>2 Nazko 1x250ml</i>		<input checked="" type="checkbox"/>				<i>1</i>	<i>Mar 8/02</i>	<i>11:30</i>			<input checked="" type="checkbox"/>							
<i>3 Nazko 1x500 Ag</i>		<input checked="" type="checkbox"/>				<i>1</i>	<i>Mar 8/02</i>	<i>11:25</i>			<input checked="" type="checkbox"/>							
<i>4 Nazko 1x16 Ag</i>		<input checked="" type="checkbox"/>				<i>1</i>	<i>Mar 8/02</i>	<i>11:25</i>			<input checked="" type="checkbox"/>							
<i>5 Nazko 3x1L</i>		<input checked="" type="checkbox"/>				<i>3</i>	<i>Mar 8/02</i>	<i>11:15</i>				<input checked="" type="checkbox"/>						
<i>6 Nazko 1x250ml</i>		<input checked="" type="checkbox"/>				<i>1</i>	<i>Mar 8/02</i>	<i>11:30</i>						<input checked="" type="checkbox"/>				
<i>7 Nazko 1x250ml</i>		<input checked="" type="checkbox"/>				<i>1</i>	<i>Mar 8/02</i>	<i>11:30</i>							<input checked="" type="checkbox"/>			
<i>8 Nazko 3x40ml</i>		<input checked="" type="checkbox"/>				<i>3</i>	<i>Mar 8/02</i>	<i>11:55</i>								<input checked="" type="checkbox"/>		
<i>9 Nazko 1x1L Ag</i>		<input checked="" type="checkbox"/>				<i>1</i>	<i>Mar 8/02</i>	<i>11:25</i>									<input checked="" type="checkbox"/>	

TAT (Turnaround Time)
 <5 DAY TAT MUST HAVE PRIOR APPROVAL
 * some exceptions apply please contact lab
 STANDARD 10 BUSINESS DAYS
 STANDARD 5 BUSINESS DAYS
 RUSH 2 BUSINESS DAYS
 URGENT 1 BUSINESS DAY
 OTHER BUSINESS DAYS

P.O. NUMBER / QUOTE NUMBER:
357028 - Mar 8/02

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE
N/A

CCME
 CSR
 ALBERTA ITER 1
 OTHER
 # JARS USED

LAB USE ONLY
 ARRIVAL TEMPERATURE °C
 LAB INFORMATION
1°C
Mar 18/02
DW

ACCOUNTING CONTACT:
 RELINQUISHED BY SAMPLER: *ASchilling*
 RELINQUISHED BY:
 RELINQUISHED BY:

SPECIAL REPORTING OR BILLING INSTRUCTIONS
 DATE *Mar 8/02* TIME *3:00 PM*
 DATE *Mar 11/02* TIME *11:35*

RECEIVED BY:
 RECEIVED BY:
 RECEIVED BY LABORATORY: *JK*

CUSTODY REC. D

ORIGINAL - PSC YELLOW - PSC PINK - CLIENT

PAGE 17 HEALTH CANADA EHS 250-564-3272 08/19/2002 13:48

SAMPLE INTEGRITY RECORD - The following bottles were received for the below project:

Client Health Canada Date Mar 11/02 Initial [Signature] C of C # 8099062

150ML CLEAR GLASS	
150ML CLEAR GLASS	
200ML AMBER GLASS	
1L CLEAR GLASS	
100ML PLASTIC	
500ML AMBER GLASS	
1000ML PLASTIC	
1500ML PLASTIC	
1500ML PLASTIC FILTERED	
1500ML PLASTIC HN03	
1500ML PLASTIC HNO3 HILTECH/05	
1500ML PLASTIC H2SO4	
150 ML PLASTIC FILTERED/H2SO4	
150 ML PLASTIC N2H4	
150ML PLASTIC NaOH/ZnAc	
Microbiology Bottle	
1000ML AMBER GLASS K2Cr2O7/H2SO4	
40ML AMBER VIALS	
PLASTIC BAG	
AIR SAMPLE	
OTHER	
✓ PRESERVATIVE CHECK	

✓ Poured off for anions

COMMENTS: - one broken 40 ml vial (frozen) in transit
- one liter plastics frozen

Sample Substudy for Compliance List

Item No.	
1	Initial C of C intact
2	Temp > 10 degrees C
3	✓ Broken Bottle in Transit
4	by C of C
5	of C information incomplete
6	of C not signified by consultant
7	of C not on C of C
8	of C not in shipment
9	Bottles in shipment, but not listed on C of C
10	Analysis Requirements identified clear
11	Labeling issue (missing number incorrect)
12	Samples received > 3 days after sampling
13	Samples received after hold time
14	Wrong bottle(s) used
15	Incorrect Preservation or Headspace present
16	Inefficient # of bottles (no Bag by consultant if inefficient sample was available in field)
17	Incorrect Lab Order (to provided to the lab)
18	Atmosphere
19	Inefficient Sample

(Item numbers checked off indicate non-compliance)

THE ANALYTICAL SERVICE

SRC ANALYTICAL

Health Canada E.H.S. Pacific

Apr-05-2002

SAMPLE	CLIENT DESCRIPTION
4509	3/18/02 BABINE LAKE NATION - BAND OFFICE *WATER*
4510	3/10/02 CANIM LAKE EAST - GILBERT RES #223 *WATER*
4511	3/18/02 NAZKO - HEALTH CLINIC *WATER*

ANALYTE	UNITS	4509	4510	4511
---------	-------	------	------	------

RADIO CHEMISTRY				
Gross alpha	Bq/L	<0.08	<0.18	<0.15
Gross beta	Bq/L	0.08±0.02	0.14±0.03	0.26±0.04

SAMPLE	CLIENT DESCRIPTION
4512	3/6/02 FT. NELSON *WATER*
4513	3/18/02 WET'SUWET'EN @ BROMAN - DUNCAN LAKE GAS STATION *WATER*
4514	3/8/02 LHOOSKU'Z - HEALTH CLINIC *WATER*

ANALYTE	UNITS	4512	4513	4514
---------	-------	------	------	------

RADIO CHEMISTRY				
Gross alpha	Bq/L	<0.16	0.17±0.08	<0.04
Gross beta	Bq/L	<0.10	0.09±0.02	0.07±0.01

"<": not detected at level stated above



Health Canada / Santé Canada

T. K. Thien
VAN 4380-720
S.N.

Environmental Health Services
First Nations and Inuit Health
Health Canada
220 - 177 Victoria Street
Prince George BC V2L 5R8

November 6th 2000
Your life / votre référence

Our life / Notre référence

Mr T K Thien P.Eng
District Engineer
Real Property Services PWGSC
Suite 450
1550 Alberni Street
Vancouver BC V6G 3C5

NOV 7 11:45

Dear TK,

Re: Nazko IR 20 - Community Water Supply

We discussed suggestions that would see the Nazko water system source revert to the original community well source while bench testing/pilot studies are being carried out on PW-1. This will confirm Environmental Health Services' view that such an initiative is imprudent and potentially in conflict with sound public health principles of safeguarding the public's health.

PW - 1 water, on analysis shows exceedences of aesthetic parameters only [iron and manganese]; analysis of the "old" village well demonstrates exceedence of the health parametized pentavalent arsenic which was the raison d'être for establishing an alternate well water source. Arsenic levels for PW-1 have been determined to be 0.0035 mg/L or roughly an order of magnitude less than the IMAC of 0.025 mg/L. Engineering advice (KWL - 559.003 March 2, 2000) states

"In the light of new research demonstrating cancer risks associated with arsenic in drinking water, the criteria for selecting a new water source should be based on finding a new raw water with the lowest possible concentration so there is little or no need to rely on treatment of the water to minimize health risks"

As a *ged* PW-1 satisfies those criteria.

Therefore, EHS recommends proceeding with a decommissioning of the "old" well to an approved pattern.

Sincerely,

I Baird
Senior Environmental Health Officer

E4380-720
FGelinas KF

Environmental Health Services
First Nations and Inuit Health
Health Canada
220 - 177 Victoria Street
Prince George BC V2L 5R8

November 3, 2000
Your file / Votre référence

Our file / Notre référence

7 8 7 9 '00 NOV -9 15

Mr F Gelinas
Capital Programs Specialist
Indian and Northern Affairs Canada
440 - 1550 Alberni Street
Vancouver, BC V6G 3C5

Dear Frank,

Re: Well No. PW-1 Nazko IR 20 - Community Water Supply

This will confirm our telephone discussion today, (Nov 3, 2000 : 0820) wherein we evaluated the initiative that would allow placing Well No PW-1 into production as a source of domestic water for the Nazko First Nation community.

Please recall that water quality for Well PW-1 fails to meet *Guidelines for Canadian Drinking Water Quality* standards for *turbidity*, (health considerations), *iron* and *manganese* (limited for aesthetic reasons). Current information (Piteau Associates Engineering - October 10, 2000) suggests turbidity levels are a function of precipitable iron. Consequently a treatment regime is necessary for iron removal and manganese attenuation. A successful treatment would allow confidence that domestic water is potable if sourced at PW-1.

As an interim measure we wish to confirm that Health Canada requires:

- Water derived from PW-1 be designated for ablutionary use only
- Bottled water or suitable potable water be made available for drinking and culinary purposes.

We understand bench testing will begin immediately with prospects that a treatment program can be developed in the very near future. Hopefully disinfection needs will be addressed concurrently as needed.

Sincerely,

I Baird
Senior Environmental Health Officer



Health Canada Santé Canada

The Times
1999-720 WJ

Environmental Health Services
First Nations & Inuit Health
220-177 Victoria Street
Prince George, B.C.
V5L 5R8

3988 99 AUG 16 15:16

Your file Votre référence

August 9, 1999

Our file Notre référence

150-5-12

Nazko

Chief Councillor Doreen Patrick
Nazko Band
3574 Hilborn Street
Quesnel, B.C.
V2J 2P7

Dear Doreen,

The following samples, collected from Nazko were tested in our Prince George lab. Results are as follows:

DATE COLLECTED: 3rd August 1999

Sample Location/Source	General Bacteria	Total Coliform	Fecal Coliform
	4	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	132	0	0
	2	0	0
	tntc	0	0


s.19(1)

Canada

REMARKS The community system water lines should be flushed and disinfected. Please resample after this has been completed.

If you need an interpretation guide or if you have any questions please feel free to call our office at 561-5389.

Yours truly,


Kerrilyn Street
Environmental Health Officer

cc: Jack Sebastian, Band Manager
Lena Hjorth, CHR
Williams Lake Health Centre, CHN
IVAC, Vancouver



Health Canada Santé Canada

E4380-720
T.K. Thien

Environmental Health Services
First Nations & Inuit Health
220-177 Victoria Street
Prince George, B.C.
V5L 5R8

0966 99 JUN 29 -8:59

Your file Votre référence

June 15, 1999

Our file Notre référence
150-5-12
Nazko

Chief Councillor Doreen Patrick
Nazko Band
3574 Hilborn Street
Quesnel, B.C.
V2J 2P7

Dear Doreen,

The following samples, collected from Nazko were tested in our Prince George lab. Results are as follows:

DATE COLLECTED: June 10, 1999

Samples submitted by K.B and V.A

Sample/Location Source	General Bacteria	Total Coliform	Fecal Coliform
CS=Community System OT=Outside Tap			
Community GW Well	0	0	0
[Redacted]	0	0	0
[Redacted]	0	0	0
[Redacted]	0	0	0

s.19(1)

REMARKS Samples are satisfactory.

If you need an interpretation guide or if you have any questions please feel free to call our office at 561-5389.

Yours truly,


Kerrilyn Street
Environmental Health Officer

cc: Jack Sebastian, Band Manager
Lena Hjorth, CHR
Holly Lynn Nelson, NIC
INAC, Vancouver

Canada

E 4390-720 T.K. THIRN



Environmental Health Services
First Nations & Inuit Health
220-177 Victoria Street
Prince George, B.C. V5L 5R8

Your file # (none reference)

June 9, 1998

9505-5-12 (none reference)

Nazko

Chief Councillor Doreen Patrick
Nazko Band
1954 Hilborn Street
Quesnel, B.C.
V2J 2P7

00 20 12 12 12 12

Dear Doreen,

The following samples, collected from Nazko were tested in our Prince George lab. Results are as follows:

DATE COLLECTED: 3rd June 1998

<u>Sample Location - Source</u>	<u>General Bacterial Population</u>	<u>Total Coliform</u>	<u>Fecal Coliform</u>
CS = GW Well, Post Super Chlorination	-	tntc	tntc
s.19(1) [Redacted]	0	0	0
Control, CS	30	2	2

REMARKS Boiling required for comm. system.

If you need an interpretation guide or if you have any questions please feel free to call our office at 561-5384.

Yours truly,

J. Henham
for Paul Broda
Environmental Health Officer

cc: Craig Buchan, Band Manager
Lena Hjorth, CHR
Williams Lake Health Centre, CHN
DNAC, Vancouver

Canada

Environmental Health Services
North East District
#317 - 280 Victoria Street
Prince George, BC
V2L 4X3

Your file Votre référence

Our file Notre référence

March 10th 1998



150-5-12
Nazko

Chief Councillor Doreen Patrick
Nazko Band
1954 Hilborn Street
Quesnel, B.C.
V2J 2P7

Dear Doreen,

The following samples, collected from Nazko were tested in our Prince George lab. Results are as follows:

DATE COLLECTED: 4th March 1998

<u>Sample Location - Source</u>	<u>General Bacterial Population</u>	<u>Total Coliform</u>	<u>Fecal Coliform</u>
School, Community GW Well, untreated	0	0	0
	2	0	0
	0	0	0

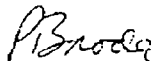
s.19(1)

REMARKS Samples are satisfactory for bacteria.

Canada

If you need an interpretation guide or if you have any questions
please feel free to call our office at 561-5384.

Yours truly,



Paul Broda
Environmental Health Officer

cc: Craig Buchan, Band Manager
Lena Hjorth, CHC
Williams Lake Health Centre, CHC
INAC, Vancouver

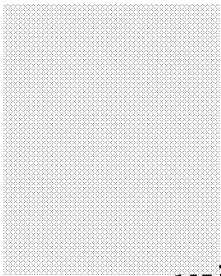
Circulation Record

ACRS - Asset Condition Reporting System 1997-8

Water, Wastewater & Roads

Reference: Nazko **BNU:** 720

Name: **Date-in:** **Date-out:** **Initials:**



s.19(1)

*ENTRY
DONE
10-2-98*

Please review the attached reports, add comments in pencil, and return to me ASAP.

Thanks,

Sid

*DIAND WATER AND SEWERAGE
INSPECTION SUMMARY*

RESERVE NAME: NAZCO 20

SITE NO.: 08296

BAND NAME: NAZKO

BAND NO.: 720

**ASSET CONDITION REPORTING SYSTEM
PHOTO**

Page of

BUILDINGS ROADS BRIDGES WATER WASTEWATER SOLID WASTE _____

Region name BC			Site no. 0 8 2 9 6			Site name (Reserve) NAZCO 20		
Band no. 7 2 0			Band name NAZKO					
Asset no. 4 0 1 0 0 1			Ext. No. B 1 B			Asset name WATER SYSTEM MAINS		
Inspected by M. MAYFIELD								
Inspection date Y Y M M D D 9 7 0 9 1 2			Year of construction 1 9 8 6			Est. Remaining life (yrs) 2 0		
						(*1) General condition rating (0-10) 0 7		
						*1-General condition rating Closed Poor Fair Good New		

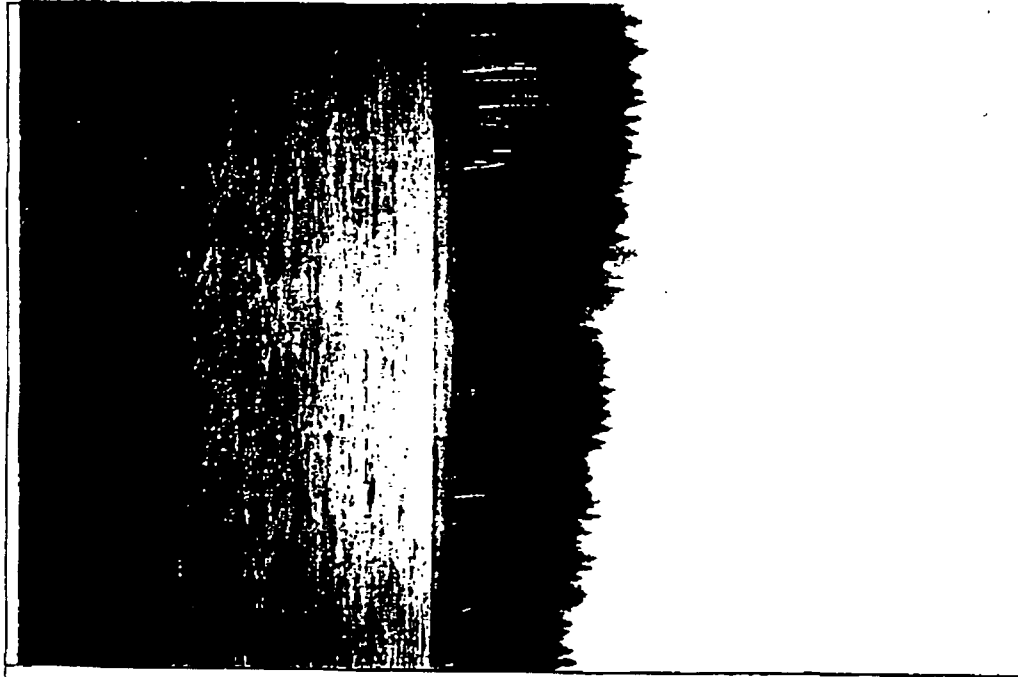


PHOTO No: 1
DESCRIPTION:
WATER MAIN
ALIGNMENT FROM
RESERVOIR



PHOTO No: 2
DESCRIPTION:
HYDRANT WITH
A TYPICAL FIRE
HOSE CABINET
- NO HOSES

ASSET CONDITION REPORTING SYSTEM PHOTO

Page of

BUILDINGS
 ROADS
 BRIDGES
 WATER
 WASTEWATER
 SOLID WASTE

Region name: BC Site no: 0 8 2 9 6 Site name (Reserve): NAZCO 20

Band no: 7 2 0 Band name: NAZKO

Asset no: 4 0 2 0 0 Ext. No.: 0 Asset code: B E Asset name: WATER RESERVOIR Inspected by: M. MAYFIELD

Inspection date: 9 7 0 9 1 2 Year of construction: 1 9 8 7 Est. Remaining life (yrs): 1 8 (*1) General condition rating (0-10): 0 7

0	1	2	3	4	5	6	7	8	9	10
X	X	X	X	X	X	X	X	X	X	X
Closed	Poor	Fair	Good	New						



PHOTO No: 3
 DESCRIPTION:
 WATER RESERVOIR



PHOTO No: 4
 DESCRIPTION:
 RESERVOIR OVERFLOW PIPE OUTLET

ASSET CONDITION REPORTING SYSTEM NEEDS IDENTIFICATION

BUILDINGS
 ROADS
 BRIDGES
 WATER
 WASTEWATER
 SOLID WASTE

Region name: BC
 Site no.: 08296
 Site name (Reserve): NAZCO 20

Band no.: 720
 Band name: NAZKO

Asset no.: A03001
 Ext. no.: B11A
 Asset code: WATERSUPPLYWELL
 Inspected by: M. MAYFIELD

Inspection date: 8/7/09 (Y M M D O)
 Year of construction: 1987
 Est. remaining life (yrs): 110
 (*1) General condition rating (0-10): 0.6
 *1 - General condition rating: 0 (0-10)

Closed Poor Fair Good New

Asset/ Component Code No.	Description of Needs	*2-Group	*3-Category	*4-Type	*5-Urgency	Amount (\$)	Needs No.
5.10	Pumphouse does not have a door handle or a lock	1	1	2	0	200	✓
NOTED ON REPORT FOR ASA-0040-01 PUMPHOUSE							

- | | | | |
|---|--|--|---|
| *2-Group
1. O&M
2. Maintenance project
3. Other | *3-Category
1. O&M/Minor Repairs
2. Major Repairs
3. Component Replacement/Reconstruction
4. Study
5. Asset Replacement/Reconstruction
6. Upgrade | *4-Type
1. Healthy/Safety
2. Restore Utility
3. Arrest Deterioration
4. Operational
5. Conform to Code
6. Other | *5-Urgency
0. Immediate
1. CY+1
2. CY+2
3. CY+3
4. CY+4
<small>*CY = Current fiscal year</small> |
|---|--|--|---|



Health Canada Santé Canada

E4380-720
FGelinas KF

Environmental Health Services
First Nations and Inuit Health
Health Canada
220 - 177 Victoria Street
Prince George BC V2L 5R8

November 3, 2000
Your file Votre référence

Our file Notre référence

Mr F Gelinas
Capital Programs Specialist
Indian and Northern Affairs Canada
440 - 1550 Alberni Street
Vancouver, BC V6G 3C5

7 8 7 9 00 NOV - 9 15

Dear Frank,

Re: Well No. PW-1 Nazko IR 20 - Community Water Supply

This will confirm our telephone discussion today, (Nov 3, 2000 : 0820) wherein we evaluated the initiative that would allow placing Well No PW-1 into production as a source of domestic water for the Nazko First Nation community.

Please recall that water quality for Well PW-1 fails to meet *Guidelines for Canadian Drinking Water Quality* standards for *turbidity*, (health considerations), *iron* and *manganese* (limited for aesthetic reasons). Current information (Piteau Associates Engineering - October 10, 2000) suggests turbidity levels are a function of precipitable iron. Consequently a treatment regime is necessary for *iron removal* and *manganese attenuation*. A successful treatment would allow confidence that domestic water is potable if sourced at PW-1.

As an interim measure we wish to confirm that Health Canada requires:

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Sincerely,

I Baird
Senior Environmental Health Officer



Health Canada Santé Canada

T. K. Thien
VANE 4380-720
S.N.

Environmental Health Services
First Nations and Inuit Health
Health Canada
220 - 177 Victoria Street
Prince George BC V2L 5R8

November 6th 2000
Your life Votre référence

Our No Notre référence

Mr T K Thien P.Eng
District Engineer
Real Property Services PWGSC
Suite 450
1550 Alberni Street
Vancouver BC V6G 3C5

Dear TK,

Re. Nazko IR 20 - Community Water Supply

We discussed suggestions that would see the Nazko water system source revert to the original community well source while bench testing/pilot studies are being carried out on PW-1. This will confirm Environmental Health Services' view that such an initiative is imprudent and potentially in conflict with sound public health principles of safeguarding the public's health.

PW - 1 water, on analysis shows exceedences of aesthetic parameters only [iron and manganese]; analysis of the "old" village well demonstrates exceedence of the health parametized pentavalent arsenic which was the raison d'être for establishing an alternate well water source. Arsenic levels for PW-1 have been determined to be 0.0035 mg/L or roughly an order of magnitude less than the IMAC of 0.025 mg/L. Engineering advice (KWL - 559.003 March 2, 2000) states

"In the light of new research demonstrating cancer risks associated with arsenic in drinking water, the criteria for selecting a new water source should be based on finding a new raw water with the lowest possible concentration so there is little or no need to rely on treatment of the water to minimize health risks"

As a *qed* PW-1 satisfies those criteria.

Therefore, EHS recommends proceeding with a decommissioning of the "old" well to an approved pattern.

Sincerely,

J Baird
Senior Environmental Health Officer

BN #720

Community :: NAZKO

Sampling Year :: 1999

DATE	LOCATION	GB	TC	FC
05/13/99	Village Main	40	0	0
05/13/99	Trout Lake Subdiv	0	0	0
05/13/99	Alec Subdiv	0	0	0
06/10/99	Community Well - Main	0	0	0
06/10/99		0	0	0
06/10/99		0	0	0
06/10/99		0	0	0
08/03/99		4	0	0
08/03/99		0	0	0
08/03/99	s.19(1)	0	0	0
08/03/99		0	0	0
08/03/99		0	0	0
08/03/99		132	0	0
08/03/99		2	0	0
08/03/99		3000	0	0
08/18/99		2	0	0
08/18/99		0	0	0
08/18/99		0	0	0
08/18/99		6	0	0

Community :: NAZKO

Sampling Year :: 2000

DATE	LOCATION	GB	TC	FC
01/17/00		18	0	0
01/17/00		0	0	0
01/17/00		8	0	0
01/17/00		0	0	0
01/17/00		0	0	0
01/17/00		16	0	0
01/17/00		0	0	0
01/17/00		0	0	0
01/17/00		6	0	0
01/17/00		22	0	0
03/02/00		13186	0	0
04/06/00	s.19(1)	0	0	0
04/06/00		8	0	0
04/06/00		0	0	0
05/22/00		4	0	0
05/22/00		2	0	0
05/22/00		4	0	0
05/22/00		142	14	2
05/22/00		0	2	0
05/22/00		0	0	0
05/22/00		0	0	0
05/22/00		0	58	2
05/22/00		0	0	0
05/22/00		0	0	0

05/22/00		16	0	0
05/22/00		0	0	0
05/22/00		0	0	0
05/22/00		74	24	4
05/22/00		.	3000	16
05/22/00		0	0	0
05/22/00		0	0	0
05/22/00		0	2	0
05/22/00		0	0	0
05/22/00		0	0	0
05/22/00	s.19(1)	0	0	0
05/22/00		1044	500	8
05/22/00		.	3000	40
05/29/00		0	0	0
05/29/00		0	0	0
05/29/00		8	0	0
05/29/00		0	0	0
05/29/00		0	0	0
05/29/00		0	0	0
05/29/00		0	0	0
05/29/00		0	0	0
05/29/00		32	0	0
05/29/00		8	0	0
05/29/00		0	0	0
07/05/00		3000	60	0
07/05/00		.	3000	74
07/05/00		12	0	0
07/05/00		0	0	0
07/05/00		2948	0	0

07/05/00		0	0	0
07/05/00		.	3000	0
07/05/00		0	0	0
07/05/00		3000	1447	4
07/05/00		214	0	0
07/05/00	s.19(1)	0	0	0
07/05/00		.	3000	10
07/05/00		0	0	0
07/05/00		0	0	0
07/13/00		0	0	0
08/16/00	Spring Water	24	8	0
10/30/00		0	0	0
10/30/00		0	0	0
10/30/00		0	0	0
10/30/00		0	0	0
10/30/00		0	0	0
10/30/00		446	0	0
10/30/00		18	24	0
10/30/00	s.19(1)	3000	122	0
10/30/00		0	0	0
10/30/00		0	0	0
10/30/00		4824	0	0
10/30/00		0	0	0
12/10/00		0	0	0
12/10/00		0	0	0
12/10/00		0	0	0
12/10/00		0	0	0
12/10/00		0	0	0

Community :: NAZKO

Sampling Year :: 2001

DATE	LOCATION	GB	TC	FC
01/07/01		880	0	0
01/07/01		524	0	0
01/07/01		28	0	0
01/07/01		456	0	0
01/07/01		0	0	0
01/07/01		4	0	0
01/07/01		0	0	0
01/07/01		106	0	0
01/07/01		4	32	0
01/07/01	s.19(1)	0	0	0
01/07/01		6	0	0
01/07/01		3000	0	0
01/07/01		0	0	0
01/07/01		3000	0	0
03/04/01		0	0	0
03/04/01		0	0	0
03/04/01		3000	2	0
03/04/01		0	0	0
03/04/01		3000	66	0
03/04/01		2	0	0
03/04/01		2412	0	0
03/04/01		0	0	0
03/04/01		1286	0	0
03/04/01		0	0	0

reel. Vancouver, BC Canada V5L 1K5

analytical
service
laboratories
Ltd.

(604) 253-6700 TEL: (604) 253-4188



CHEMICAL ANALYSIS REPORT

Date: June 8, 2000

ASL File No. L7308

Report On: 2136 Water Analysis

Report To: Piteau Assoc. Engineering Ltd.
215 - 260 West Esplanade
North Vancouver, BC
V7M 3G7

Attention: Mr. David Tiplady, Senior Hydrogeologist

Received: May 25, 2000

ASL ANALYTICAL SERVICE LABORATORIES LTD.
per:

Scott P. Hockstra
Scott P. Hockstra, B.Sc. - Project Chemist

Sarena McHugh
Sarena McHugh, B.Sc. - Project Chemist



RESULTS OF ANALYSIS - Water

File No. L7308

Sample ID PW#2

Physical Tests

Colour	(CU)	9
Conductivity	(umhos/cm)	497
Total Dissolved Solids		299
Hardness	CaCO3	224
pH		7.94
Turbidity	(NTU)	44.8

Dissolved Anions

Alkalinity-Total		CaCO3	286
Chloride	Cl		0.7
Fluoride	F		0.18
Sulphate	SO4		<1

Nutrients

Nitrate Nitrogen		N	<0.1
Nitrite Nitrogen		N	<0.1

Bacteriological Tests

Coliform Bacteria - Fecal		2
Coliform Bacteria - Total		4

Total Metals

Aluminum	T-Al	<0.005
Arsenic	T-As	0.0037
Barium	T-Ba	0.030
Boron	T-B	<0.05
Cadmium	T-Cd	<0.0002
Calcium	T-Ca	39.9
Chromium	T-Cr	<0.001
Copper	T-Cu	<0.001
Iron	T-Fe	5.70
Lead	T-Pb	<0.001
Magnesium	T-Mg	30.3
Manganese	T-Mn	0.462
Mercury	T-Hg	<0.00005
Potassium	T-K	6.25
Selenium	T-Se	<0.001
Sodium	T-Na	11.3
Uranium	T-U	0.00001
Zinc	T-Zn	0.014

Remarks regarding the analyses appear at the beginning of this report.
 < = Less than the detection limit indicated.
 Results are expressed as milligrams per litre except where noted.
 Coliform results are expressed as Most Probable Number (MPN) per 100 mL.



RESULTS OF ANALYSIS - Water

File No. L70

Sample ID	PW #1	PW #1
Sample Date	00 05 16	00 05 16

Total Metals

Aluminum	T-Al	<0.005	-
Antimony	T-Sb	<0.0001	-
Arsenic	T-As	0.0029	0.0022
Barium	T-Ba	0.030	-
Beryllium	T-Be	<0.001	-
Boron	T-B	<0.05	-
Cadmium	T-Cd	<0.0002	-
Calcium	T-Ca	48.3	-
Chromium	T-Cr	0.001	-
Copper	T-Cu	<0.001	-
Iron	T-Fe	8.50	-
Lead	T-Pb	<0.001	-
Magnesium	T-Mg	32.2	-
Manganese	T-Mn	0.519	-
Mercury	T-Hg	<0.00005	-
Nickel	T-Ni	<0.001	-
Potassium	T-K	7.71	-
Selenium	T-Se	<0.001	-
Sodium	T-Na	11.5	-
Thallium	T-Tl	<0.001	-
Uranium	T-U	<0.00001	-
Zinc	T-Zn	0.012	-

Dissolved Metals

Iron	D-Fe	0.04	-
Manganese	D-Mn	0.489	-

Remarks regarding the analyses appear at the beginning of this report.
 < = Less than the detection limit indicated.
 Results are expressed as milligrams per litre except where noted.
 Coliform results are expressed as Most Probable Number (MPN) per 100 mL.

APPENDICES

720-007

RECEIVED SEP 08 2000



PHILIP ANALYTICAL
08-Sep-00
PAGE 1 OF 7

8577 Commerce Court
Burnaby, B.C.
Canada V5A 4N5
Tel 604 444 4808
Fax 604 444 4511
1 800 440 4808
Ext 232

Certificate of Analysis

Reported To :

RADLOFF ENGINEERING INC.

Client Code OK

#350-6TH AVENUE
PRINCE GEORGE

Attention : RICK SENGER
Phone : (250) 562-6861
FAX : (250) 562-6826

RADLOFF ENGINEERING INC.

72 Horn
7687

Project Information :

Project ID : NAZKO WELL
Submitted By: ANDREW WIENS

Requisition Forms :

Form 08057219 logged on 31-Aug-00 completed on 08-Sep-00

Remarks :

- ☞ All organic data is blank corrected except for PCDD/F, Hl-res MS and CLP volatile analyses
- ☞ 'MDL' = Method Detection Limit, '<' = Less than MDL, '-' = Not analyzed
- ☞ Solids results are based on dry weight except Biota Analyses & Special Waste Oil & Grease
- ☞ Organic analyses are not corrected for extraction recovery standards except for Isotope Dilution methods, (i.e. CARB 429 PAH, all PCDD/F and DBD/DBF analyses)
- ☞ All Groundwater samples except BTEX/VOC's or Purgable Hydrocarbons are decanted and/or filtered prior to analysis unless otherwise mandated by regulatory agency
- ☞ This report shall not be reproduced except in full, without the written approval of the laboratory

Methods used by Philip are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 20th Edition, published by the American Public Health Association, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the appropriate regulatory agency. Methodology briefs are available by written request.

All work recorded herein has been done in accordance with normal professional standards using accepted testing methodologies, quality assurance and quality control procedures except where otherwise agreed to by the client and testing company in writing. Liability for any and all use of these test results shall be limited to the actual cost of the pertinent analysis done. There is no other warranty expressed or implied. Your samples will be retained at Philip for a period of 30 days from receipt of data or as per contract.

PHILIP Project Manager: Sarena McHugh

Sarena McHugh 206



PHILIP ANALYTICAL

ANALYTICAL REPORT

01-Sep-00
Page 3 of 7

Client : RADLOFF ENGINEERING INC.
Project : NAZKO WELL

Philip ID : 10055138
Client ID : NAZKO #2

Spaccode	Parameter	Unit	MDL	
Tc-T0042	Tellurium	mg/L	0.05	< 0.05
Tl-TMS42	Thallium	mg/L	0.0001	< 0.0001
Sr-T0042	Tin	mg/L	0.02	< 0.02
Ti-T0042	Titanium	mg/L	0.003	< 0.005
V-T0042	Vanadium	mg/L	0.005	< 0.005
Zn-T0042	Zinc	mg/L	0.005	0.006
Zr-T0042	Zirconium	mg/L	0.005	< 0.005
METALS DISSOLVED				
Al-D0031	Aluminum Dissolved	mg/L	0.02	< 0.02
Sb-D0031	Antimony Dissolved	mg/L	0.05	< 0.05
As-DM331	Arsenic Dissolved	mg/L	0.001	0.003
Ba-D0031	Barium Dissolved	mg/L	0.001	0.029
Be-D0031	Beryllium Dissolved	mg/L	0.0002	< 0.0002
Bi-D0031	Bismuth Dissolved	mg/L	0.05	< 0.05
B-D0031	Boron Dissolved	mg/L	0.008	< 0.008
Cd-DM331	Cadmium Dissolved	mg/L	0.0001	< 0.0001
Ca-D0031	Calcium Dissolved	mg/L	0.05	33.3 ✓
Cr-D0031	Chromium Dissolved	mg/L	0.005	< 0.005
Co-D0031	Cobalt Dissolved	mg/L	0.005	< 0.005
Cu-D0031	Copper Dissolved	mg/L	0.005	< 0.005 ✓
Fe-D0031	Iron Dissolved	mg/L	0.005	9.25 ✓
Pb-DM331	Lead Dissolved	mg/L	0.001	< 0.001 ✓
Mg-D0031	Magnesium Dissolved	mg/L	0.05	38.6 ✓
Mn-D0031	Manganese Dissolved	mg/L	0.001	0.540 ✓
Hg-D0310	Mercury Dissolved	mg/L	0.00005	< 0.00005
Mo-D0031	Molybdenum Dissolved	mg/L	0.005	< 0.005
Ni-D0031	Nickel Dissolved	mg/L	0.008	< 0.008
P-D0031	Phosphorus Dissolved	mg/L	0.1	0.3 ✓
K-D0031	Potassium Dissolved	mg/L	1	1
Se-DM331	Selenium Dissolved	mg/L	0.001	< 0.001
Ag-DM331	Silver Dissolved	mg/L	0.0001	< 0.0001 ✓
Na-D0031	Sodium Dissolved	mg/L	0.05	12.6 ✓
Sr-D0031	Strontium Dissolved	mg/L	0.001	0.301 ✓
S-D0031	Sulfur Dissolved	mg/L	0.1	< 0.1
Tc-D0031	Tellurium Dissolved	mg/L	0.05	< 0.05
Tl-DM331	Thallium Dissolved	mg/L	0.0001	< 0.0001
Sr-D0031	Tin Dissolved	mg/L	0.02	< 0.02
Ti-D0031	Titanium Dissolved	mg/L	0.003	< 0.005

Matrix : Water
Sampled on: 00/08/00 16:00

CONTINUED on page 4

Aug 30 @ 4:00 PM

PHILIP: 72 Hour TEST



44-193

PHILIP ANALYTICAL

08-Sep-00
Page 2 of 7

ANALYTICAL REPORT

Client : RADLOFF ENGINEERING INC.
Project : NAZKO WELL

PhilSp ID : 10055138
Client ID : NAZKO #2

Spacoda	Parameter	Unit	MDL	
PHYSICAL				
00081071	Residue Nonfiltrable (TSS)	mg/L	4	18 ✓
00091050	Residue Fixed Nfil.	mg/L	1	14
0010CALC	Residue Vol-Nonfil.	mg/L		4
00151140	Turbidity	NTU	0.10	71.9 ✓
0107CALC	Hardness Total -T	mg/L		278 *
1107CALC	Hardness Total -D	mg/L		292 *
CARBON				
01030912	Organic Carbon - Total	mg/L	1.0	9.2 ✓
METALS TOTAL				
Al-T0042	Aluminum	mg/L	0.02	< 0.02
Sb-T0042	Antimony	mg/L	0.05	< 0.05
As-TMS42	Arsenic	mg/L	0.001	0.003
Ba-T0042	Barium	mg/L	0.001	0.029 ✓
Be-T0042	Beryllium	mg/L	0.0002	< 0.0002
Bi-T0042	Bismuth	mg/L	0.05	< 0.05
B-T0042	Boron	mg/L	0.01	< 0.01
Cd-TMS42	Cadmium	ug/L	0.0001	< 0.0001
Ca-T0042	Calcium	mg/L	0.05	30.5 (1) ✓
Cr-T0042	Chromium	mg/L	0.005	< 0.005
Co-T0042	Cobalt	mg/L	0.005	< 0.005
Cu-T0042	Copper	mg/L	0.005	< 0.005
Fe-T0042	Iron	mg/L	0.005	8.93 (1) *
Pb-TMS42	Lead	mg/L	0.001	< 0.001
Mg-T0042	Magnesium	mg/L	0.05	36.8 (1) ✓
Mn-T0042	Manganese	mg/L	0.001	0.514 (1) ✓
Hg-T0310	Mercury	ug/L	0.00005	< 0.00005
Mo-T0042	Molybdenum	ug/L	0.005	< 0.005
Ni-T0042	Nickel	mg/L	0.01	< 0.01 ?
P-T0042	Phosphorus	ug/L	0.1	0.2
K-T0042	Potassium	mg/L	1	8 (1) ✓
Se-TMS42	Selenium	ug/L	0.001	< 0.001
Ag-TMS42	Silver	ug/L	0.0001	< 0.0001
Na-T0042	Sodium	mg/L	0.1	11.8 (1) ✓
Sr-T0042	Strontium	ug/L	0.001	0.293 (1) ✓
S-T0042	Sulfur	mg/L	0.1	0.1

Matrix :
Sampled on: 08/08/00 16:00

CONTINUED on page 3

Aug 30 @ 4:00 PM



PHILIP ANALYTICAL

ANALYTICAL REPORT

08-Sep-00
Page 4 of 7

Client : RADLOFF ENGINEERING INC.
Project : NAZKO WELL

Philip ID : 10055133
Client ID : NAZKO #2

Speccode	Parameter	Unit	MDL	
V-D0031	Vanadium Dissolved	mg/L	0.005	< 0.005
Zr-D0031	Zinc Dissolved	mg/L	0.005	< 0.005
Zr-D0031	Zirconium Dissolved	mg/L	0.005	< 0.005

Matrix : Water
Sampled on: 00/08/30 16:00

Result comments and/or test results :

(1) Diss > Total, within precision of analytical method.



PHILIP ANALYTICAL

09-Sep-00
Page 5 of 7

ANALYSIS DATES

Philip ID: 10055158
Client ID: NAZKO #2

00081071	Residue Nonfilterable (TSS)	01-SEP-2000
00091050	Residue Fixed Nfilt.	05-SEP-2000
00151140	Turbidity	05-SEP-2000
TOC-W	15004 Sparg/Ox-Mem Color	05-SEP-2000
Hg-T0310	Mercury	05-SEP-2000
ICPMSTOT	Water: Total Metals ICPMS	07-SEP-2000
ICP-TOT	Water: Total Metals ICP	07-SEP-2000
Hg-D0310	Mercury Dissolved	05-SEP-2000
ICP-DIS	Water: Dissolved Metals ICP	06-SEP-2000
ICPMSDIS	Water: Dissolved Metals ICPMS	01-SEP-2000

Matrix: Water
Sampled on: 30-AUG-2000



PHILIP ANALYTICAL

01-Sep-00
Page 6 of 7

BATCH NUMBERS

Philip ID: 10055138
Client ID: NAZKO #2

00081071	Residue Nonfilterable (TSS)	04403278
00091050	Residue Fixed Nfilt.	04403281
00151140	Turbidity	04403291
TOC-W	15004 Spong/Ox-Mem Color	04101734
Hg-T0310	Mercury	04202789
ICPMS TOT	Water: Total Metals ICPMS	04202811
ICP-TOT	Water: Total Metals ICP	04202813
Hg-D0310	Mercury Dissolved	04202789
ICP-DIS	Water: Dissolved Metals ICP	04202825
ICPMS DIS	Water: Dissolved Metals ICPMS	04202783

Matrix: Water
Sampled on: 30-AUG-2000



PHILIP ANALYTICAL

BLANK SUMMARY

08-Sep-00
Page 7 of 7

All method blanks were less than MDL, except the following:

Parameter	Batch	Spacode	Blank Conc.	MDL	Unit
Calcium	04202813	Ca-T0042	0.09	0.05	mg/L



PHILIP ANALYTICAL SERVICES
 8577 Commaica Court Phone: (604) 444-4808
 Burnaby, B.C. V5A 4N5 Fax: (604) 444-4511
 Toll Free: 1-800-440-4808

COMPANY NAME: Radloff Engineering Inc.		PH. #: (250) 562-6861 562-6861		ANALYSIS REQUEST 8057219										
COMPANY ADDRESS: #350 - 6th Avenue Prince George		CLIENT PROJECT ID: (P) Nazko Well												
SAMPLER NAME (PRINT): Andrew Wiens		PROJECT MANAGER Rick Senger												
FIELD SAMPLE ID	PHILIP LAD # (Lab Use Only)	MATRIX				# CONTAINERS	SAMPLING		HEADSPACE VAPOUR	Metals - Dissolved (by MS)	Metals - Total (by MS)	VSS	TOC	Turbidity
		GROUND WATER	SURFACE WATER	SOIL	OTHER		DATE	TIME						
Nazko #2-A	55138	✓				1	Aug 30/00	6:00 pm		✓				
Nazko #2-B		✓				1	Aug 30/00	6:00 pm		✓				
Nazko #2-C		✓				1	Aug 20/00	6:00 pm			✓			
Nazko #2-D		✓				1	Aug 20/00	6:00 pm				✓		
Nazko #2-E		✓				1	Aug 30/00	6:00 pm					✓	

CUSTODY RECORD TAT 100 West <input type="checkbox"/> 050 West <input checked="" type="checkbox"/> 48 Hours <input type="checkbox"/> 24 Hours <input type="checkbox"/> Other _____	PO. NUMBER / QUOTE NUMBER: BC00-161	SPECIAL DETECTION LIMITS / CONTAMINANT TYPE Metals (Dissolved and Total) by Mass Spec.	LAB USE ONLY LAB INFORMATION
	ACCOUNTING CONTACT:	SPECIAL REPORTING OR BILLING INSTRUCTIONS EDT <input type="checkbox"/>	2 Sep 08/00 DW
	RELINQUISHED BY SAMPLER: Andrew Wiens	DATE Aug 20/00	TIME 6:30 pm
RELINQUISHED BY:	DATE 80/08/31	TIME 3:50	RECEIVED BY: lw

Sample Date:		Mar 05 2001			Feb 01 2001		Dec 01 2000		May 24 2000	GCDWO
Sample ID		PW-1	PW-1 A/F	PW-1 A/F	PW-1	PW-1 F	PW-1	PW-1 F	PW-1	
Total Metals (mg/L)										
Aluminum	Al	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	< 0.005	-
Arsenic	As	0.0033	0.0019	0.0022	0.0035	0.0034	0.0038	-	0.0029	0.025
Barium	Ba	0.027	0.019	0.019	0.027	0.028	0.030	-	0.03	1.0
Boron	B	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	5.0
Cadmium	Cd	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-	< 0.0002	0.005
Calcium	Ca	52.2	50.4	50.9	43.9	44.6	50.9	-	48.3	-
Chromium	Cr	< 0.005	< 0.005	< 0.005	< 0.001	< 0.001	0.001	-	0.001	0.05
Copper	Cu	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	< 0.001	1.0
Iron (a - lab/sample error)	Fe	7.8	4.8	2.16	8.2 \ 8.79	8.2	< 0.03 (a)	-	8.5	0.3
Lead	Pb	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	< 0.001	0.01
Magnesium	Mg	32.3	31.9	32.1	32.4	33.6	37.2	-	32.2	-
Manganese	Mn	0.526	0.508	0.507	0.447 \ 0.445	0.455	0.546	-	0.519	0.05
Mercury	Hg	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	-	< 0.00005	0.001
Potassium	K	8.65	8.61	8.54	7.66	7.96	8.13	-	7.71	-
Selenium	Se	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	< 0.001	0.01
Sodium	Na	11.4	11.2	10.3	11.1	11.5	10.9	-	11.5	200
Uranium	U	< 0.00001	< 0.00001	< 0.00001	0.00004	< 0.00001	< 0.00001	-	< 0.00001	0.10
Zinc	Zn	0.019	0.010	0.009	0.005	< 0.005	0.005	-	0.012	5.0
Dissolved Metals (mg/L)										
Aluminum	Al	< 0.005	0.010	< 0.005	< 0.005	< 0.005	-	< 0.005	-	-
Arsenic	As	0.0031	0.0021	0.0021	0.0036	0.0037	-	0.0038	-	0.025
Barium	Ba	0.027	0.019	0.019	0.028	0.028	-	0.030	-	1.0
Boron	B	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05	-	5.0
Cadmium	Cd	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	-	< 0.0002	-	0.005
Calcium	Ca	50.6	51.5	51.2	44.8	45.4	-	51.3	-	-
Chromium	Cr	< 0.005	< 0.005	< 0.005	< 0.001	< 0.001	-	0.001	-	0.05
Copper	Cu	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	< 0.001	-	1.0
Iron (a - lab/sample error)	Fe	7.8	1.6	2.06	8.3	8.1 \ 8.69	-	< 0.03 (a)	0.04	0.3
Lead	Pb	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	0.002	-	0.01
Magnesium	Mg	32.5	32.4	31.8	33.7	33.7	-	37.3	-	-
Manganese	Mn	0.511	0.521	0.502	0.455	0.473 \ 0.449	-	0.550	0.489	0.05
Mercury	Hg	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	-	< 0.00005	-	0.001
Potassium	K	8.57	8.68	8.58	8.02	8.21	-	8.23	-	-
Selenium	Se	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	-	< 0.001	-	0.01
Sodium	Na	11.1	10.4	10.4	11.3	11.4	-	10.0	-	200
Uranium	U	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.00001	-	< 0.00001	-	0.10
Zinc	Zn	0.020	0.016	0.008	0.005	< 0.005	-	0.005	-	5.0

Notes: Entries with duplicate result/analysis are separated by \
F - Filtered, A/F - Aerated/Filtered, All filtering in field with 0.45 micron filter.

P:\0500-0599\559-009\data-calcs\chem analysis.xls]Sheet1

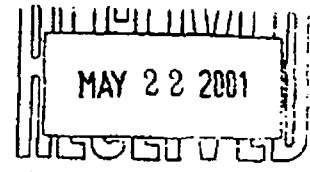


PITEAU ASSOCIATES
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May 17, 2001



File 559 009

Kerr Wood Leidal Associates Ltd.
139 West 16th Street
North Vancouver, B.C.
V7M 1T3

Attention: Mr. D.J. Sanders, A.Sc.T.

Dear Sirs:

Re: Hydrogeological Assessment - Nazko I.R. 20, Nazko, B.C.

Piteau Associates Engineering Ltd. (Piteau) was retained by Kerr Wood Leidal Associates Ltd. (KWL) to review groundwater conditions and water quality in the vicinity of Nazko I.R. 20, and to address the potential for variation in water quality parameters during long-term pumping from two new wells constructed on the Reserve in 2000. We were also asked to consider the potential for regional variations in groundwater quality, and the possibility of locating a groundwater source requiring less treatment than groundwater from PW-1 and PW-2.

Piteau has previously conducted groundwater investigations at Nazko, and was involved with construction of PW-1 and PW-2. The results of this groundwater supply development program are summarized in a June 2000 report to the Nazko Band Government entitled "Groundwater Supply Investigation for Nazko I.R. 20, Nazko, B.C."

GROUNDWATER QUALITY

The attached Table I summarizes all available groundwater analysis data for PW-1 and PW-2 compiled from previous work by Piteau, and subsequent sampling and analysis by KWL. Concentrations of iron and manganese exceed allowable limits, as do turbidity and other parameters such as the total trihalomethane formation potential and gross alpha radiation. The total organic carbon (TOC) concentration in groundwater from PW-1 is also relatively high, and levels in groundwater from PW-2 are also expected to be high. Although there is no maximum allowable limit for TOC, this is a concern due to the potential for organic carbon to complex with dissolved iron and complicate water treatment processes, and due to the potential for forming undesirable byproducts if chlorine disinfection is used. For this reason, a TOC concentration of less than 2.5 mg/L is desirable.

Although the arsenic concentrations in groundwaters from PW-1 and PW-2 are below the maximum allowable concentration (MAC) of (0.025 mg/L) specified in the Canadian Drinking Water Guideline (CDWG), this parameter is of general concern, given that the arsenic concentration in the deeper well formerly used to supply the village (New Well) exceeds the MAC. We believe that the relatively high concentration in the lower aquifer may result from its proximity to volcanic bedrock, which may be the source of the high arsenic levels.

Parameter	Units	Guidelines (1)	Observed Range
Turbidity	NTU	< 5	47.9 - 94.1
Iron	mg/L	0.3	7.8 - 8.79
Manganese	mg/L	0.05	0.445 - 0.546
TOC (THM precursors)	mg/L	-	7.5 - 8.2
THMFP	mg/L	0.100	0.406
Gross Alpha	Bq/L	0.1	< 0.18 - 0.35

(1) Guidelines for Canadian Drinking Water Quality, 1996

In the field, it was observed that the water samples from PW-1 were always clear at the time taken, yet turbidity results were consistently much higher when analyzed the next day at the laboratory. Additional acidified samples taken indicated that most of the turbidity was likely the result of the dissolved iron precipitating as colloidal iron. This would be due to exposure to air during the sampling program.

Piteau Associates have evaluated the raw water quality and groundwater conditions for wells PW-1 and PW-2. For reference, their letter report dated May 17, 2001 is appended to this document.

DISCUSSION OF TREATABILITY

Based on the work completed to date, several technical issues must be addressed to determine the most suitable direction to proceed further. These are outlined as follows:

- complexity of treatment
- testing for radionuclides
- operational requirements
- project schedule
- project cost

Complexity of Treatment

The requirements for treating the water from PW-1 and PW-2 can be separated into two distinct paths as follows:

- Path 1; address all of the stated parameters of concern, except Gross Alpha
- Path 2; address all parameters including potential radionuclides (Gross Alpha).

In both cases, the level of total organic carbon adds a complicating factor since these include precursors for disinfection byproduct formation (THM's), and they significantly complicate the treatment process required for removal of iron and manganese. Given the complex chemistry of

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the raw water, any proposed treatment of the wells PW-1 and PW-2 will likely require piloting before a treatment process can be finalized.

Path 1

Addressing all of the parameters of concern, except Gross Alpha, requires a process train that would include several stages of treatment including chemicals such as oxidants, a coagulant, polymers and possibly pH adjustment. Adsorption with granular activated carbon may also be required to further reduce the total organic carbon level in the finished water. A "package plant" type of process available from different suppliers will be the best candidate for treating this water.

Path 2

Including Gross Alpha as a treatment parameter provides additional complexity because of treatment process issues and dealing with a radioactive waste stream. The best available technology for removing gross alpha (excluding radon and uranium) is reverse osmosis. However, the reverse osmosis process would also require extensive pre-treatment to be effective and provide for a reasonable membrane life. Testing of individual radionuclides that make up Gross Alpha will be needed to better define the treatment process.

As mentioned, regardless of the treatment process, extensive piloting will be a necessity. Process, selection of chemicals and dosages for correct operation of a new treatment system remain to be confirmed.

Testing for Radionuclides

Should treatment of PW-1 and PW-2 proceed, testing for individual radionuclides would be required. This would be costly and time consuming. Currently samples are sent to the Saskatchewan Research Council, as there are no testing facilities for these parameters in British Columbia. As noted, the treatment process required for addressing radionuclides, if applicable, may not be suitable for a small remote community because of operational and special waste handling issues.

Operational Requirements

The treatment process selected for PW-1 and PW-2 will require a certified operator to care for the daily operation of a treatment plant. Similar to most other small water systems, this community initially will likely not have the staff with the qualifications and experience to operate a system that would be required to treat groundwater from PW-1 and PW-2.

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7. CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

Based on the findings of this report, it is concluded that:

1. The groundwater from wells PW-1 and PW-2 is high in iron, manganese, organic carbon and possibly radionuclides.
2. Several processes are available for treatment of groundwater from wells PW-1 and PW-2. Treatment of this water is very difficult and will require additional water sampling and pilot testing to verify a process.
3. Groundwater from wells PW-1 and PW-2 cannot be assured as a suitable source of supply for the community.
4. Any treatment of groundwater from PW-1 and PW-2 requires a highly trained certified operator, which may preclude the implementation of the identified treatment process.
5. If the level of radionuclides are confirmed to be above the guidelines, an additional step of reverse osmosis is considered the best available technology. However, the difficulty associated with disposal of a special waste may preclude the implementation of this option.
6. The PCI Membrane System option has a lower capital cost if used to treat Stump Lake water instead of the groundwater from PW-1 and PW-2. It is possible to have a PCI Membrane plant for Stump Lake completed by the end of 2001.
7. A new groundwater source that has acceptable raw water quality or is easy to treat will have the lowest life cycle cost. However, the probability of finding a suitable groundwater source is low.

7.2 RECOMMENDATIONS

Based on the above conclusions, it is recommended that:

1. The Band adopt the recommendations of this report.
2. The Band proceed with preliminary design of water supply from Stump Lake with treatment by the PCI Membrane system.
3. As requested by INAC, the Band continue with the search for a suitable groundwater source that would require a simple treatment system.