D. OPERATING PROCEDURES FOR HYPOCHLORINATOR

Step 1. Insure that the hypochlorinator circuit breakers #8 and #10 in the "Breaker Panel" are "ON" and the chemical pump electrical cord is plugged into the wall receptacle labeled "automatic". This will automatically turn on the chemical pump each time the water pumps are run to fill the tank truck.

Step 2. Prepare the chlorine solution in 10 gallon (45.4 litre) batches for better quality. This amount should last approximately one month. Fill the chlorine mix tank with 10 gallons of water; by opening the cold water feedline valve tag No.3 during a truck filling operation; or by closing gate valve No. 1 on the mainline and operating the pump. Five gallon intervals are marked on the side of the tank. Then add 3 cups of the chlorine granules from the 100 lb. drum provided. Plug the chemical mixer into the manual receptacle and mix for several minutes or until disolved. Repeat the mixing operating once a week when the pump is not operating.

Note: A white sediment will settle to the bottom of the mix tank. Once it reaches a depth (approx. 3", 75 mm) that can enter the pump intake, it should be dumped out of the tank.

Step 3. Turn the dial setting on the chlorine pump to six. Operate the pump a few minutes before testing the chlorine level with the test kit provided.

The following method can be used to test for a chlorine residual level of .3 mg/ℓ (i.e. the colour of the sample will match the colour of the .3 mg/ℓ circle of the test kit.)

A) During a pumping operation, open sample tap and hose bib fitting located on cold water line one foot to the right of gate valve (No. 1) and allow some water to run, before filling the two glass sample tubes to the white lines on each tube.

B) Put the two glass tubes in the square holder with the colour coded circles; one in the center and one on the left hand side.

C) Fill the eye dropper to the white line with chemical from the bottle provided and empty this into the center glass tube.

D) Wait five minutes, then compare the colour of the center tube with the coloured circles for a chlorine residual level. The coloured circle with the same colour as the center tube indicates the mg/ℓ residual chlorine level.

E) If the colour in the center tube is darker than the circle colour at the .3 mg/ℓ, turn the dial on the chlorine pump to 5 and repeat the chlorine residual test.

Lower the dial number on the chlorine pump until the center tube colour appears similar to the colour of the .3 m/ℓ circle.

F) If the colour in the center tube is lighter than the colour of the circle colour at .3 mg/ℓ turn the dial on the chlorine pump to 7 and repeat the chlorine residual test.

Raise the dial number on the chlorine pump until the center tube colour appears similar to the colour of the .3 m/ℓ circle.

Step 4. Once the desired chlorine residual level .3 mg/ℓ has been established, the test should be made in the pump house once per day. Then adjust the dial setting on the chlorine pump as required.

NOTE: Once a week the chlorine residual should be tested at the point of delivery. Test a sample from the truck while delivering to a building, this will indicate accurately the chlorine residual level. Adjustments should then be made to the dial setting on the chlorine pump to obtain .2 mg/ℓ minimum.

The American Water Works Association and the Ontario Ministry of Environment both require a .2 mg/ℓ minimum free residual chlorine level after 10 min. of contact for a complete destruction of bacteria.

CHAPTER 6

SPECIAL PROCEDURES

A. SPECIAL PROCEDURES FOR REMOVING PUMP

Step 1. Make sure the electrical power to the pumps and the heat trace system has been turned off at the "Breaker" Panel "A".

Step 2. Unplug the heat trace cable and the pump electrical cable at the receptacles mounted on the pump house wall above the inclined shafts.

Step 3. Loosen the four nuts on the flange plate at the end of the shaft to permit the rubber seal to decompress. Do not remove the nuts since the bolts may drop out into the inclined shaft.

Step 4. Remove the six bolts around the flange plate and remove the plate and the rubber seal.

Step 5. Unhook the pump pull cable from the ring bolt in the pump house floor and attach it to the winch. Under some circumstances, it may be easier to pull the pump manually rather than use the winch.

Step 6. As the winch is cranked, the discharge pipe from the pump will start to come out of the shaft and should be directed through the pump house door as the removal progresses.

Note: The pump discharge piping is approximately 46 m (150 ft.) long.

Step 7. Once the pump has been withdrawn from the shaft the power cable should be unclamped, the pull cable disconnected and the flange connecting the pump undone to release the pump. To unclamp the pull cable, undo the stainless steel band clamps holding the cable to the discharge piping. Then undo the U-bolts above the swivle to disconnect the power cable. Remove black tape then unwind copper wire connections on each wire.

Note: For detailed instructions on the pump operation and maintenance, refer to Chapter 10-2.

SPECIAL PROCEDURES

A. SPECIAL PROCEDURES FOR REMOVING PUMP (cont'd)

Step 9. To reinstall the pump, reverse the above noted steps.

NOTE: The pump only needs to be removed in the event of a loss of water caused by a pump breakdown. No other service will be required.

SPECIAL PROCEDURES

B. SPECIAL PROCEDURES FOR BACKFLUSHING INTAKE SCREENS

Note: If filling the tank truck takes longer than the normal 12 minutes or the pressure in the discharge line drops below the normal 3 p.s.i. when the pump is running, the problem may be that the intake screen is partially plugged with floating debris. Backflushing of the screen is possible as explained in the following steps.

Step 1. Turn off the electrical power at the "Breakers Panel" for Pump No. 1.

Step 2. Close Gate Valve No. 1 and Gate Valve No. 2.

Step 3. Connect fire hose from an external source such as the water tank truck or fire pumper to the hose connection on the intake shaft, (Fitting No. 2 on the plan entitled 'Pump House Piping and Fittings' included in this Chapter).

Cautions:

1. The backflush pressure should never be allowed to exceed 30 p.s.i. as measured by a pressure gauge on the hose from the external water supply. Blockages not removed by backflushing to these pressures will require the services of a diver.

2. The intake is protected against floatation only for 10 percent of its volume as air. Any backflushing procedure which could result in more than 10 percent by volume of air in the intake will result in the intake pipe floating to the surface.

CHAPTER 7

WATER SUPPLY SYSTEM
FOR
HAMLET OF IGLOOLIK - N.W.T.

LUBRICATION AND MAINTENANCE SCHEDULES

Lubrication and maintenance requirements are provided in Chapter 10 in the amnufacturer's brochures for each component.

CHAPTER 8

WATER SUPPLY SYSTEM
FOR
HAMLET OF IGLOOLIK - N.W.T.

OPERATION AND MAINTENANCE RECORDS

The contents of this chapter will be prepared by the staff of the Department of Public Works, Government of the North-west Territories.

CHAPTER 9

TESTING & CERTIFICATION DATA

I N D E X

CHAPTER 9

TESTING & CERTIFICATION

Pressure Test by: John Griffiths and Forrest Krause
October 28, 1980

Procedure: Gate Valve 1 and Gate Valve 2 closed. Start pump, pressure built up to 600 KPa (87 PSI). Several leaks at the Victaulic couplings.

Leaks to be repaired and retested included on the deficiency list.

No leaks at 345 KPa 50 PSI and operating pressure is 6.9 KPa (1 PSI) to 20.7 KPA (3 PSI).

IGLOOLIK WATER SUPPLY SYSTEM

PROJECT 78-118

CONTRACT CT 79-30-316

DEFICIENCIES SEPTEMBER 4, 1980

1. South Lake Pumphouse

.1 No gravel pad

.2 Pipe bedding incomplete

.3 Site cleanup

.4 Piping connection at the pump discharge is unacceptable

2. Truck Fill Station

.1 Remote start/stop station

.01 Arrangement to be revised to include one key only.

.02 Remote counter incorrectly wired. Requires a 120 V circuit, approved wire and fittings. (See also 4.1)

.03 Enclosure is not weatherproof (CEMA 4)

.2 Pump Control cabinet

.01 Labelling required

.02 Should contain a duplicate set of controls, one set wired for use, the second set maintained as a spare.

.03 Schematic on door to be revised.

3. Intake Piping

.01 Sleeving detail at the wall not per specification.

.02 Colour code for pump cables change at splice.

.03 Heat trace sensor wiring requires mechanical protection.

.04 One sensor lead not approved wiring. (Possible splice in wet area) Sensor must be ordered with correct lead lengths and positioned below low water level.

..../2

.05 Require quick disconnects on sensor leads.

.06 Victaulic elbow welded to flange fitting not acceptable.

.07 If Victaulic connections are used in lieu of welded and flanged, additional supports and thrust bracing will be required.

.08 Backwash fittings and hose required.

.09 Replace flange bolts with bolts of correct length (nuts are used as spacers).

4. Chlorinator

.1 Require receptacle for both mixer and chlorinator. (chlorinator receptacle only to be switched from pump control cabinet). Split duplex acceptable.

.2 Label receptacles.

.3 Hose and wall hanger.

.4 Single control circuit for feed pump and water meter.

5. Other

.01 Truck turnaround area incomplete.

.02 Electric heater not installed.

.03 Space heater and chimney not installed.

.04 Combustion air intake not installed.

.05 Fire extinguisher not to specifications.

.06 Flexible hose required on overhead truck fill arm.

.07 Wiring for floor drain heat trace not to code. (Splice inside drain in steel floor is hazardous).
NOTE: Acceptance by Safety Division required.

..../3

.08 Oil storage tank mounted on steel and plywood. (Concrete specified).

.09 All pipes through wall to be sleeved as per typical detail specified.

Prepared by,

J.L. Clegg,
Project Manager,
Project Management,
Engineering Division,
Department of Public Works.

c.c. O.M.M.
Ottawa & Igloolik

Back Bay Welding,
Yellowknife, N.W.T.

Hamlet of Igloolik,
Regional Engineer.

Local Government,
Yellowknife, N.W.T.

Frank Kelly,

NOTE:

1. Pump to be pulled on next inspection
2. Power to site by September 30.

Job: 78-1879

December 11, 1980

IGLOOLIK WATER SUPPLY SYSTEM

PROJECT 78-118

CONTRACT 79-30-316

DEFICIENCIES OCTOBER 27, 1980
REVISED DECEMBER 10, 1980

1. South Lake Pump House

   (a) No gravel pad for the building.

   (b) 150 m of pipe bedding. Not complete.

   (c) Site clean up.

   (d) Pump discharge connection not acceptable.

2. Truck Fill Station

   (a) Remote start-stop enclosure not CEMA 4

   (b) Lamacoid labels not on all switches, plugs, particularly capacitor box with reset buttons below box.

   (c) Mechanical piping not parallel to building.

   (d) Repair leaks in two victaulic couplings, retest to 670 KPA and slope all pipes to self drain.

   (e) Connection to water meter to be 76 mm to 50 mm with replacement spool of proper length.

   (f) Base tee and automatic thermostat to be installed on oil heater.

   (g) Locking gradient damper to be supplied for cold air intake.

   (h) Trim and paint insulation around 250 mm pipe at inside building wall.

   (i) Holes in wall where light removed to be caulked and sealed.

(j) Change threshold to metal.

(k) Replace homemade 'U' clamps.

(l) Truck fill turnaround gravel incomplete and culvert not installed.

(m) Operations and Maintenance Manual and the information.

(n) Protect creek crossing fill and tie fill line to hydro poles.

MATERIALS TO BE SUPPLIED

1. One 76 m gate valve.
2. Two thermistors and control.
3. One 100 amp fuse.
4. 25 ft. backwash hose with proper fittings.

NOTE: The FPE Model UH27 53-1 5 KW single phase heated is equivalent to the Chromalox BUH 51.

PREPARED BY: _____
John Griffiths, P. Eng.

JG:mw

GOVERNMENT OF THE NORTHWEST TERRITORIES
CANADA

CONTRACT CHANGE ORDER 508

X
- [ ] FORMAL – CONSTRUCTION
- [ ] INFORMAL – SERVICE

HA ORDER NO.	CONTRACT NO. 79-30-318	PROJECT NO. 78-118	DATE 9/1/80
CONTRACTOR Bay Welding Services Ltd.		LOCATION Yellowknife, N.W.T.	
ROJECT ~~Igloolik Water Supply~~			

he above contract is to be changed as follows:

1. Modify South Lake Pumphouse in preparation for reservoir fill-up - Add 2,175.00
2. Provide labour and materials for reservoir fill-up - Add 9,599.31
3. Charter for fusing machine - Add 2,124.28

Net Extra 13,898.59

See Attachments 118-1, 118-2, 118-3, 118-4 and 10509 and 118-5

GOVT OF N.W.T.
TREASURY BRANCH
Posted To Commitment
JAN 21 1980
Control

ntract amount to be Reduced/Increased by	Completion date was 20 December/79
XXXX $ 13,898.59	And is now August 30/80

IGINAL AMOUNT	TOTAL ADDITIONS	TOTAL DEDUCTIONS	REVISED CONTRACT
197,450.00	$ 13,898.59	$ –	$ 211,348.59

CEPTED
Janet Paul 14/1/80
CONTRACTOR DATE

ACCEPTED
Roy Anderson 14 Jan. 1980
PROJECT OFFICER DATE

CEPTED
DEPARTMENT DIRECTOR DATE

APPROVED ORIGINAL SIGNED
R. S. PILOT
COMMISSIONER OF THE N.W.T. JAN 16 1980
DATE

ANCIAL CODING
.609-203226-091-940

COMMITTED
AUTHORIZED TREASURY SIGNATURE DATE

6518 (10/70)

TRIBUTION: PINK – Regional Treas... GREEN – ...

CANADA

CONTRACT CHANGE ORDER

[X] FORMAL - CONSTRUCTION
[ ] INFORMAL - SERVICE

CHANGE ORDER NO.	CONTRACT NO.	PROJECT NO.	DATE
2	79-30-316	78-118	January 26,1981

CONTRACTOR	LOCATION
Back Bay Welding Services Ltd.	Site 17, Box 36 Yellowknife, N.W.T.

PROJECT: IGLOOLIK WATER SUPPLY SYSTEM

The above contract is to be changed as follows:

1.	Dewatering		24,778.79
	.1 Pumping	5,075.00	
	.2 Siphon	4,656.22	
	.3 Supply Pump	15,047.57	
		24,778.79	
2.	Additional fill material at Pumphouse & Ramp		15,696.00
3.	Additional Pipe (Intake Line)		775.00
4.	Additional Pipe (Fill Line)		2,647.40
5.	Butt Fusion Machine Rental		3,616.36
	Total Change Order		$47,513.55

Contract amount to be ~~Reduced~~ / Increased by $ 47,513.55

Completion date was August 30/80
And is now October 27/80

ORIGINAL AMOUNT	TOTAL ADDITIONS	TOTAL DEDUCTIONS	REVISED CONTRACT
$ 197,450.00	$ 61,412.14	$ NIL	$ 258,862.14

ACCEPTED _____ CONTRACTOR — Jan. 27/81 DATE

ACCEPTED _____ PROJECT OFFICER — 81.01.26 DATE

ACCEPTED _____ DEPARTMENT DIRECTOR — DATE

APPROVED _____ COMMISSIONER OF THE N.W.T. — DATE

CIAL CODING: Project 78-118

COMMITTED _____ AUTHORIZED TREASURY SIGNATURE — DATE

.W.T. 6518 (10/70)

DISTRIBUTION: BLUE - Program Manager; PINK - Regional Treasury; WHITE - Contractor; GREEN - Commitment Control

CHAPTER 10

MANUFACTURERS BROCHURES

I N D E X

CHAPTER 10

HAMLET OF IGLOOLIK - N.W.T.

MANUFACTURERS BROCHURES

NO.	DESCRIPTION	MANUFACTURER	SUPPLIER
1	Pump House Building	Bally Refrigeration Canada Limited	Bally Refrigeration Brockville, Ontario
2	Submersible Pumps	Jacuzzi Canada Ltd.	Jacuzzi Canada Ltd. 330 Humberline Drive Rexdale, Ontario M9W 1R5 (416) 675-3333
3	Water Meter	Neptune Meters Limited	Neptune Meters Ltd., 12455 Rue April Pointe-Aux-Trembles, Que. 514-351-1844
4	Chlorinator	Wallace & Tiernan	Wallace & Tiernan 925 Warden Ave., Scarborough, Ontario M1L 4C5 416-751-7561
5	Remote Totalizer	Helcon	Neptune Meters Ltd., 12455 Rue April Pointe-Aux-Trembles, Que. 514-351-1844
6	Heat Trace Control	Elkon Electric Ltd. 1961 55th Avenue Dorval, Quebec 636-0510	Dupont Canada BP 660 Succ. "A" Montreal, Quebec 514-861-3861
7	Heat Trace Cable	Thermon	Thermon Canada Ltd., 431 Newbold St., London, Ontario
8	Oil Heater Chimney	Coleman, Rexdale, Ontario Selkirk Metalbestos Brockville, Ontario	Westburne Limited 4590 Henri-Bourassa Blvd. Montreal, Quebec (514) 332-5331
9	Electric Heater	Federal Pioneer Ltd.	Westburn Alberta Electric Supply Ltd. 13155-149 St. Edmonton, Alberta
10	Winch	Fulton	International Winch Inc. 2615 Le Corbusier Laval, Quebec 514-687-9220

HAMLET OF IGLOOLIK - N.W.T.

MANUFACTURERS BROCHURES

NO.	DESCRIPTION	MANUFACTURER	SUPPLIER
11	Gate Valves	Crane	Westburne Limited, 4590 Henri-Bourassa Blvd. Montreal, Quebec 514-332-5331
12	Electrical Panel Pump Control Panel	Hammond Allan West	Westburne Alberta Electric Supply Ltd., 13155-149 St. Edmonton, Alberta 452-2131
13	Warning Light	Crouse-Hinds	N.R. Electric Limited, 131 St. Charles, Ste. Therese, Quebec 514-430-3838
14	Low Pressure Swivel Joint	Avcor Swivel Joint	I.T.T. Grinnel 11340 - 120th Street Edmonton, Alberta. 403 - 452-9841
15	Thermometer Pressure Gauge and Pressure Gauge	Tel-Tru Mfg. Ashcroft	Westburne Limited 4590 Henri-Bourassa Blvd., Montreal, Quebec (514) 332-5331
16	South Lake Pump House Engine	Ford	Wilron Equipment 12606-125 Street Edmonton, Alberta (403) 452-4490
17	Power Take-Off Clutch	Rockford	Wilron Equipment 12606-125 Street Edmonton, Alberta (403) 452-4490
18	South Lake Pump House Pump	Monarch 889 Erin St., Winnipeg, Man. P.O. Box 429	Wilron Equipment 12606-125 Street Edmonton, Alberta (403) 452-4490