OPERATION AND MAINTENANCE MANUAL

FOR

WATER TRUCKFILL STATION

HAMLET OF PANGNITUNG

DEAPRTMENT OF COMMUNITY AND GOVERNMENT SERVICES

GOVERNMENT OF NUNAVUT

OPERATION AND MAINTENANCE MANUAL

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VOLUME I

FOR

WATER SUPPLY SYSTEM

AT

PANGNIRTUNG - N.W.T.

Year of Completion - 1987

Original Scope - Reservoir - Truck Fill Station

This manual has been updated to include:

DATE	DESCRIPTION OF CHANGE

PANGNIRTUNG WATER SUPPLY SYSTEM

D.P.W. Project Manager	Sukhi Cheema
D.P.W. Project Engineer	Reg Andres
D.P.W. Project Engineer	Tim Smyth
Prime Consultant	F.J. Reinders and Associates Limited Iqaluit, N.W.T.
Electrical Consultant	J.A.D. Engineering Ltd. Brampton, ON
Soil Consultant	Thurber Consultants Ltd. Calgary, AB
Liner Quality Control Consultant	Hanson Materials Engineering Edmonton, AB
Contractor	Tower Arctic Ltd. Montreal
Mechanical Sub-Contractor	Nortuk Ltd. Brampton, ON
Liner Sub-Contractor	Nilex Ltd. Edmonton, AB
Electrical Sub-Contractor	Albert Colaris Electric Scarborough, ON
Generator Supplier	Peel Engine Service Co. Ltd. Mississauga, ON

PANGNIRTUNG WATER SUPPLY SYSTEM

OPERATION AND MAINTENANCE MANUAL

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SECTION 10 MANUFACTURERS BROCHURES AND DATA

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- H.D.P.E. Piping
- Liner
- Fence
- Manhole
- Filter Cloth
- Insulation
- Culverts

MECHANICAL

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- Chlorine Equipment
- Dolphin Floating Suction
- 6" Gorman-Rupp Water Pump
- Grundfos Submersible Pumps
- Fuel Oil Tank Levelometer
- Reservoir Levelometer
- Fuel Oil Tank Level Sensor
- Flow Switch
- Tech Taylor Valve
- Flow Meter and Sensor
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- 8" Butterfly Valve

ELECTRICAL

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- Control Panel
- Dampers

APPENDIX REDUCED CONSTRUCTION DRAWINGS

VOLUME II

DIESEL GENERATOR MANUAL

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terrafix®
filter fabrics inc.

69 Westmore Drive, Unit 3, Rexdale, Ontario M9V 3Y7 Telephone (416) 745-7290 Telex 06989136

Invoice No. Nº 0525

Tower Arctic Ltd.,
1350 Sherbrooke S t. W.,
Suite 920,
Montreal, Quebec.
H3G 1J1

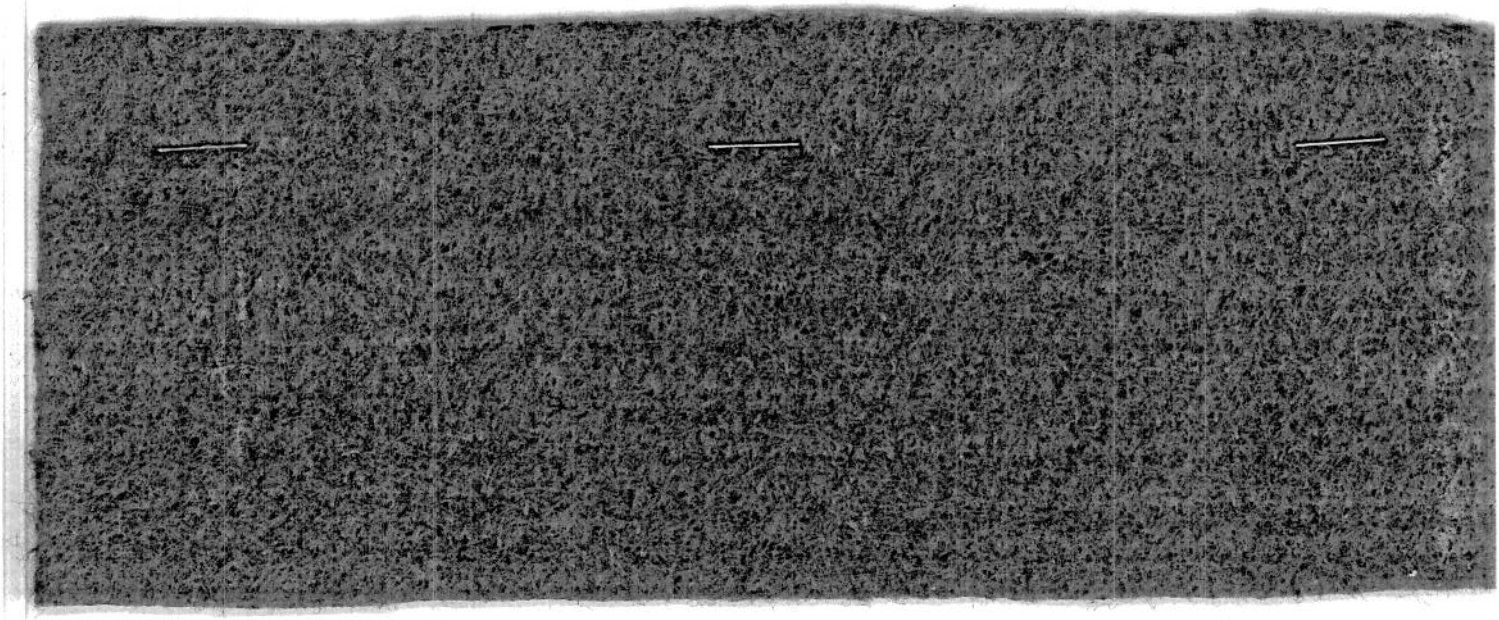
Date July 19, 1985

Your Order No.2655

Terms Net 30 days

Our Job No. 85-296

	POLYFELT T.S.700		



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DIESEL GENERATOR MANUAL

PANGNIRTUNG WATER SUPPLY

TABLE OF COMPONENT FUNCTIONS

NO.	ITEM	LOCATION	FUNCTION PERFORMED	REMARKS
1	Intake Screen	At end of intake line in reservoir.	Screens coarse particles.	Slopes at 5:1.
2	Well Pump	Intake line in reservoir.	Pumps water to truck.	Submerged. Approx. 1 m off bottom.
3	Backwash Nipple	On intake line.	Backwashing of intake screen.	
4	Butterfly Valve	In pump discharge line.	Allows for pump removal.	
5	Tech Taylor Valve	Junction of pump discharge lines.	Controls direction of flow.	
6	Gate Valve	On backwash hose connection.	Shuts off backwash hose line.	
7	Backwash Hose Connection	Off discharge line.	For backwashing of intake screen.	
8	Thermometer	On discharge line.	Measures water temperature in line.	
9	Pressure Gauge	On discharge line.	Measures line pressure.	
10	Chlorinator Water Supply Line	Off discharge line.	Filling of chlorinator tanks.	
11	Gate Valve	On chlorinator water supply line.	Shuts off chlorinator filling line.	
12	Butterfly Valve	On discharge line.	To be shut off when backwashing the intake lines.	

NO.	ITEM	LOCATION	FUNCTION PERFORMED	REMARKS
13	Flow Sensor	On discharge line.	Sensor for flow meter.	
14	Chlorine Injector	On discharge line.	Injects chlorine solution into water.	
15	Spare Injector Connection	On discharge line.	Spare connection point.	
16	Flow Switch	On discharge line.	Activates chlorinator.	
17	Arm Extension	On discharge arm.	To reduce length of freehanging hose.	
18	Quick Connect Adaptor	On arm extension.	For connecting discharge hose.	

PANGNIRTUNG WATER SUPPLY

TABLE OF COMPONENT DETAILS

NO.	NAME/MAKE/MODEL/SIZE	DATA	SETTINGS	REMARKS
1	Stainless Steel Intake Screen	AISI Type 304 S.S. 500 mm dia. slot 3 mm 250 mm ASA flange.		Tilsonburg Pipe Supply Tilsonburg, ON
2	Submersible Turbine Pump. Grund Foss Model SP45-2	16.6 L/S @ 172 kPa Motor 208 V, 3 Ø, 60 Hz, 5.0 HP.		Lenpar Corp. Thornhill, ON 416-731-7850
3	Backwash Nipple			
4	100 mm Butterfly Valve Victaulic Series 700	Lever Operated Iron Body, Bronze Disc, Grade 'E' Seal		Emco Supply Co. Toronto, ON 416-742-6220
5	100 mm Tech Taylor Check Valve. Technequip Limited Model T2V4R-A15 CRS			Technequip Ltd. Weston, ON 416-749-3991
6	65 mm Gate Valve			Emco Supply Co. Toronto, ON
8	125 mm Dial Thermometer. Trerice Model No. 1385404	-50°C to 120°C 13 mm Threaded Male Connection.		H.O. Trerice Co. Mississauga, ON 416-762-2340
9	113 mm Dial Pressure Gauge Trerice Model No. 500X	0 to 1200 kPa		H.O. Trerice Co. Mississauga, ON
11	13 mm Gate Valve			Emco Supply Co. Toronto, ON
12	100 mm Butterfly Valve Victaulic Series 700			Emco Supply Co. Toronto, ON 416-749-3991

NO.	NAME/MAKE/MODEL/SIZE	DATA	SETTINGS	REMARKS
13	Paddle Wheel Flow Sensor. Signet Model MK515-PO	Mounted with Saddle Model IR8S040 for 100 mm Galvanized Pipe.		Brian Engineering Toronto, ON 416-890-5880
16	Flow Switch McDonnell & Mille No. FS4-3DS	N.P.T. Male Thread for a 25 mm Threadolet		E.H. Young Weston, ON 416-749-9146
17	100 mm Aluminum Arm Extension Piece Female Thread 1 Side. Male Thread Other Side.	Removeable Arm Extension		
18	Female N.P.T. Adaptor O.P.W. 633 A.			Emco Supply Co. Toronto

TRUCK FILL CONTROL PANEL

The outside control panel allows the operation of the pumps without entering the station. The layout of the panel is as follows:

			"A" Stop Button (Red)
A	B	C	'B' 2nd Duty Pilot Light (White)
			'C' 2nd Duty Selector Switch
			'D' Start Button (Green)
D	E	F	'E' "Pumping" Pilot Light (Red)
			'F' "Wait" Pilot Light (Amber)

Under normal operation, the truck driver will push the green button to start the pump and the red button to stop. The red pilot light will be on when the pump is running.

When the pump is stopped, the water in the piping system will drain back to the reservoir. This will cause the pump to turn backwards and starting the pump during this period will damage the pump. A timer was, therefore, installed in the control panel to prevent the starting of the pump during this period. The amber "Wait" light will be on during this time.

If for any reason the duty pump does not start, the second duty pump can be selected by turning the selector switch. The second duty pump can then be used as per the instructions described above. The white pilot light will be on to indicate that the second duty pump is operating. By selecting the second duty pump, an alarm light will be activated inside the pumping station. It is impossible to switch back to the first duty pump until the pumping station operator turns it back on inside the pumping station.

CHLORINATOR EQUIPMENT

CAUTION Wear the rubber gloves, apron and goggles when working with the chlorination equipment.

CHLORINE SOLUTION

NOTE Do not run the pump for filling the chlorinator tanks only. Fill the tank while a truck is being filled.

Fill the upper tank up to the mark with water (100 litres).

Fill the measuring cup up to the mark with chlorine powder and add to the water in the tank (.75 kg).

Mix thoroughly for 2 minutes.

Top up the lower solution tank regularly from the upper tank.

Never let the solution in the lower tank go below half full.

OPERATION OF CHLORINATOR

The chlorine mixture is a 0.5% chlorine solution. With the chlorinator operating at the factory set speed, the chlorine content of the water discharged to the truck should be approximately 0.8 part per million. Some chlorine will be used up (oxidized) while in the truck and the content when delivered to the homes should be approximately 0.5 part per million.

Testing of the water should be done after the water has been in the truck a minimum of 15 minutes. If the test shows the chlorine content to be higher than 0.5 p.p.m., the solution strength should be reduced until the desired chlorine content is reached.

Should the test show considerably less than 0.5 p.p.m., increase the chlorine powder content of the solution.

Oct. 1987

PANGNIRTUNG CHLORINE MIX

Chlorinator maximum capacity 65 U.S.G.P.D. (0.171 litres/min)

Truck fill rate 1000 litres/minute

Desired chlorination rate 0.5 to 1 p.p.m

Free chlorine in powder 65%

Drum capacity 114 litres, say 100 litres/mixing batch.

Required solution strength

1 p.p.m: 1 - 1,000,000 - (0.171 - 1000) X 100 = 0.59% chlorine

0.5 p.p.m: 0.5 - 1,000,000 - (0.171 - 1000) X 100 = 0.29% chlorine

For initial start up, use 0.5% chlorine solution.

Therefore, chlorine dosing $1 \times \frac{.50}{.59} = 0.85$ p.p.m.

0.5% chlorine solution:

100 litres (100 kg) requires .5 kg chlorine.

65% free chlorine:

$.5 \times \frac{100}{65} = .77$ kg chlorine powder/100 litre solution

If chlorine content from truck discharge too high or too low, adjust mixture until free chlorine in truck discharge is approximately .5 p.p.m.

Check label of chlorine powder for each shipment. If percentage of free chlorine differs, adjust chlorine mix accordingly.

SYSTEM BACKWASHING

Once a month the pump intakes should be backwashed. The following procedure should be followed.

Set the duty pump on the main panel to pump No. 1. Connect the hose to the hose connection (No. 7) on the discharge line and open valve (No. 6).

Connect the other end to the nipple (No. 3) on the intake casing of pump No. 2.

Close the valve (No. 12) on the discharge line. Turn on pump No. 1 and run for 2 minutes.

Shut off pump No. 1.

Change duty pump setting on main panel to pump No. 2.

Disconnect hose from the No. 2 pump intake casing and connect to the No. 1 pump casing.

Turn on pump No. 2 and run for 2 minutes. Shut off pump No. 2.

Disconnect hose from the intake casing. Close valve and disconnect the from the hose connection (No. 7). Open up main valve (No. 12).