

TOWN OF ST. GEORGE'S, NL

“HOW TO SUCCESSFULLY DEVELOP A DRILLED WELL WATER SUPPLY”



Presenters:

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Dribble Brook



The Town of St. George's main water supply was Dribble Brook.

It could easily fill the water demand of the Town.

Why didn't we continue with this?



Water Quality concerns, such as high colour and organic content along with **THM's**



Trihalomethanes are formed as a by-product predominantly when chlorine is used to disinfect water for drinking. They represent one group of chemicals generally referred to as disinfection by-products. They result from the reaction of chlorine and/or bromine with organic matter present in the water being treated.



Year	THMs Average
2006	219.18
2007	262.77
2008	255.00
2009	330.88

2010 8.94 (New Water)

**The guidelines for Canadian Drinking Water Quality Is
100 micrograms per litre for THM's in drinking water.**

The New Drilled Water was not the first attempt to provide good quality drinking water to the Town.

The Town was incorporated in 1965
Studies began in 1972







Quantity and Quality is needed

**The Quantity was high enough to supply the Town
but there was high dissolved chloride and sodium**

**that exceeded the
Total Dissolved Solids**

for

Guidelines for Canadian Drinking Water Quality



**When this was discovered the Town was
disconnected from these wells and reconnected to
Dribble Brook.**

DEVELOP A GAME PLAN

- Assemble the 'TEAM'
- Solicit pre-design funds
- Establish the Project Engineer/Project Lead
- Commence Hydro-Geological Investigation
- Drill Production Well(s)
- Interim Report
- Solicit More \$\$\$\$

Hockey SOURCE DRILL SHEET

LEGEND: ---> Passing ---| Stopping
 © - Coach ↖ Stickhandling → Shooting
 F - Forwards ||||| Cross-overs
 D - Defense → Forward Skating
 G - Goalie ↖ Backward Skating

Date: _____ Team: _____ Practice Time: _____

	<p>Drill Name <u>Swiss Middle, D-D Shoot</u> Description <u>F, Passes to D₁. D₂ Passes to D₁, F, Curls close to boards and receives a pass from D₁. F, Shoots. Same thing both sides.</u> Key points <u>Timing/Hard Crisp Passes.</u> Duration (min): _____ Running time (min) _____</p>
	<p>Drill Name <u>Screen 1 vs 1</u> Description <u>F passes to D on blue line, then goes to front of net for deflection. F receives pass from corner and plays 2-on-1 down ice. Both ends.</u> Key points <u>Hard low shot from D. Good screen in front.</u> Duration (min): _____ Running time (min) _____</p>
	<p>Drill Name <u>Three Shoot, 2 v 1</u> Description <u>F₁, F₂, D, skate from blue line & shoot. F receives pass from coach and plays out 2-on-1 on defensenman happens bothends.</u> Key points <u>D - Play for pass, don't screen G. F, be creative.</u> Duration (min): _____ Running time (min) _____</p>
	<p>Drill Name <u>Three Passes, Shoot</u> Description <u>X₁ leaves corner w/back and passes to X₂. X₁ & X₂ make Three Passes back and forth, Then X₁ Shoots on net.</u> Key points <u>Quick One touch Passing</u> Duration (min): _____ Running time (min) _____</p>

Game Plan cont'd

- Implement Water Conservation Strategies
- Design the Well Field
- Proceed with Construction
- Commission the Works
- Monitor the Long Term Performance of the new well field.

Assemble the Team

- Establish a 3 person committee to steer the project.
 - Owner
 - Engineer
 - Government
- Engage an Engineering Consultant
 - Engage a hydro-geologist



Funding for Phase 1

- In 2001/2002 \$360,000 funding was granted under the Canada / Newfoundland Infrastructure Program (CNIP) for Phase 1 of the New Water Supply
- Phase 1 covered the desktop analysis and field program required to determine if a drilled well water supply was a viable option and where the potential well field may be located. Monitoring wells were also drilled.

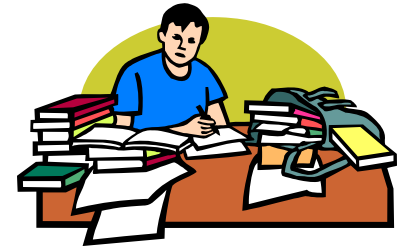
Establish Project Engineer / Project Lead

- It is time to select the Consultant who will design and activate the well field.
 - This stage is an opportunity to tweak the roster!
 - Do not go for proposals again unless there are issues with the original team members.



Commence the Hydro-geological Investigation

- Conduct desktop analysis of existing information
- Conduct an initial field program
- Conduct a monitoring well program
 - Monitoring wells
 - Step drawdown tests
 - Water quality
 - Geotechnical soils analysis
- Submit Report complete with well field development recommendations



Drill Production Well(s)



- Production Wells vs Monitoring Wells????
- Conduct Long Term Pump Test. (min 72hr)

Interim Hydro-Geological Report

- Provide summary of pump testing
- Provide water quality results
- Provide recommendations on:
 - Number of wells
 - Depth of wells
 - Pumping rates of each well
 - Depth to pumps
 - Any other 'site specific' recommendations



Funding for Phase 2

- \$300,000.00 low interest loan and \$210,000.00 GRANT provided under the Green Municipal Infrastructure Fund (GMIF) in 2003 due to the innovative nature of the project.
- The GMIF funding also topped up with a further \$150,315.00 GRANT to assist with the implementation of water conservation initiatives.
- \$1,500,000.00 was granted under the Municipal Capital Works program in 2004 for Phase 2.
- Phase 2 included additional well drilling and long term pump testing.

Phase 2 Funding cont'd

- \$1,500,000.00 was granted under the Municipal Capital Works program in 2004 for Phase 2 construction.
- In addition to the design and construction of the well field, Phase 2 included additional well drilling and long term pump testing.
- Pre-design work indicated that construction costs may approach the \$2,000,000.00 mark.
- Additional \$575,000.00 granted in 2008 under the MCW program.

Implement Water Conservation Strategies

- Grant Money / FREE MONEY!!!!!!
- \$360,315.00
- -Low Flow Shower Heads
- -Insulate Water Pipes
- -Water Meters for 10% of Homes
- -Detailed Water Protection Study



Design the Well Field

- Follow the Hydro-Geological Report
- Select Disinfection type
- Is Water Treatment required??
- SCADA is a must!
- Install on-line monitoring equipment
- Install level and pressure transmitters, flow meters, conductivity meters and so on
- Variable Frequency Drives (VFD's)
- Contact Tanks
- Storage
- Common Disinfection Building



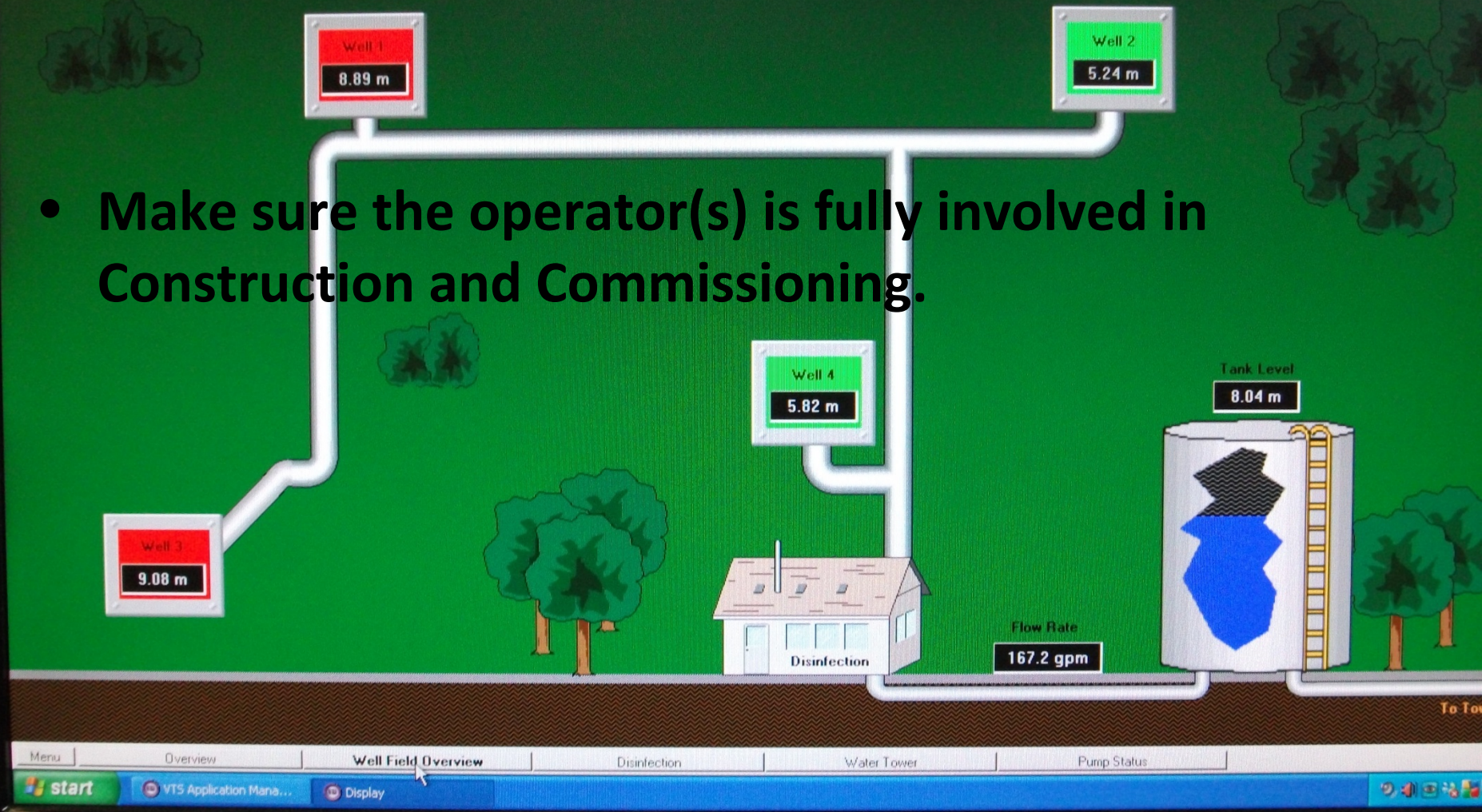
Proceed with Construction



- Insist on top quality work with full time inspection

Commission the Works

- Make sure the operator(s) is fully involved in Construction and Commissioning.



Monitor the Long Term Performance of the Well Field

- SCADA is a power tool, use it to its full extent!
 - Monitor well water levels
 - Monitor recovery rates
 - Monitor flow rates
 - Monitor water quality
- Forward long term SCADA info to the Hydro-Geologist
- Use the VFD's to tweak the flow from each well
- Use the transmitters to tweak the safe draw down of each well

