
**REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, 18 APRIL 2007**

SUBJECT REPLACEMENT OF CELLULAR TELEMTRY AND SATELLITE PHONES WITH UHF
RADIOS AT HYDRO-METEOROLOGICAL STATIONS

PURPOSE

To advise that UHF radios were purchased to replace dated analog cellular phones at hydro-meteorological stations in the Capital Regional District (CRD) watershed.

BACKGROUND

There are 14 hydro-met stations within the CRD and Leech River watersheds, which collect data on precipitation, air temperature, wind speed and direction, water level, solar radiation, turbidity and snow depth. This data is used by the Engineering and Planning Division to monitor the water supply system and by the Watershed Protection Division to calculate the forest fire hazard and for use during wildfire suppression activities. The data from 9 of these stations is downloaded by telephone (6 by cellular and 3 by Globalstar satellite telemetry) to the Operations Centre twice per day. Data from the remaining stations (5) is downloaded manually about every 2 weeks by visiting each site.

The cellular provider, Rogers, has notified us that they will no longer support the analog cellular service at 6 of the hydro-met sites as of May 31, 2007, as they will convert all operations to digital technology. The existing analog modems are not compatible with the new digital technology. Telus was contacted to check if we could change carriers however, Telus stated that their analog technology is not compatible with the existing modems and furthermore, they too will be eliminating analog service in 2008. If another means of communication is not utilized, each site would have to be visited daily to download data.

ALTERNATIVES

1. Do not replace the analog modems.
2. Replace 6 analog modems with Globalstar satellite phones.
3. Replace 6 analog modems with GOES satellite phones and retain Globalstar satellite phones at 3 of the sites.
4. Replace analog modems with UHF radios, install a UHF radio at the CRD Water Services office and retain the 3 existing Globalstar satellite phones.
5. Replace 6 analog modems and 3 satellite phones with UHF radios and install a UHF radio at the CRD Water Services office.

FINANCIAL IMPLICATIONS

Alternative 1. Do not replace the analog modems.

The fire index based on data collected at the fire weather stations is calculated daily during fire season and is used to determine the state of the watershed and to schedule work, e.g. under extreme fire hazard, work must cease by 1 pm. The data is also used to monitor the water supply system on a daily basis.

If the analog modems were not replaced with another type of telemetry, the sites would have to be visited once per day to download data. It would take 1 staff member about half a day to visit sites and download data on a daily basis. During adverse weather conditions staff may not be able to access all sites. During fire suppression it would not be prudent to have staff remain at the nearest station to monitor and report on conditions.

Annual Cost for staff to manually download data daily:

\$35,000

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Alternative 2. Replace 6 analog modems with Globalstar satellite phones.

Currently, Globalstar satellite phones are used at 3 of the sites. However, Globalstar satellite phones are not always reliable and there is a monthly fee of about \$100 per site. Furthermore, the dataloggers at the 6 analog modem sites are not compatible with the satellite phones and would have to be upgraded.

| | |
|--|-----------------|
| Cost of 6 satellite Globalstar phones | \$25,000 |
| Cost of dataloggers | \$24,000 |
| Installation cost | <u>\$ 1,700</u> |
| Total Cost (incl. taxes) | \$50,700 |
| Annual Air Time Fees for 9 satellite phones | \$12,000 |

Alternative 3. Replace 6 analog modems with GOES satellite phones and retain Globalstar satellite phones at 3 of the sites.

The disadvantage with GOES satellite phones are that the hydro-met station cannot be called from the office. GOES phones download at a specified time. If staff wanted to obtain current conditions, they would have to wait until the designated download time. This could be a disadvantage during a fire or under flood conditions. GOES phones are reliable however, in order to obtain these phones, a sponsor such as Water Survey Canada is required and it is not known if a sponsor could be found. Also, the dataloggers at the 6 analog modem sites are not compatible with the satellite phones and would have to be upgraded. There are no air time fees for GOES phones.

| | |
|----------------------------|-----------------|
| Cost of 6 GOES phones | \$28,500 |
| Cost of dataloggers | \$24,000 |
| Installation Cost | <u>\$ 1,700</u> |
| Total (incl. taxes) | \$54,200 |

Alternative 4. Replace 6 analog modems with UHF radios, install a UHF radio at the CRD Water Services office and retain the 3 existing Globalstar satellite phones.

Globalstar satellite phones are not always reliable and there would be a monthly air time fee for the satellite phones.

Cost of 7 radios and ancillary equipment is as follows:

| | |
|--|-----------------|
| Radios & ancillary works (Exact cost not known until cable lengths confirmed) | \$37,000 |
| Installation | \$ 9,000 |
| Repeater station (if necessary) | <u>\$11,000</u> |
| Total (incl. taxes) | \$57,000 |
| Annual air time fees for 3 satellite phones | \$ 4,000 |

The high installation cost is due to antenna installation on existing towers.

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Alternative 5. Replace 6 analog modems and 3 satellite phones with UHF radios and install 1 UHF radio at the CRD Water Services office.

The existing satellite phones will be kept in service until the end of fire season (October 31) in the event there are start up problems with the radios, or it is found that a repeater station is necessary. The need for a repeater station will not be known until the proposed radio system is installed however, preliminary testing indicates that a repeater station will not be required. Globalstar satellite phones are located at the most important fire weather stations. The satellite phones can also be set up to temporarily act as a hub, i.e., the satellite phones could temporarily collect data from radios where there might be a communication problem with the radio system.

Cost of 10 radios and ancillary equipment is as follows:

| | |
|--|-----------------|
| Radios & ancillary works (Exact cost not known until cable lengths confirmed) | \$51,000 |
| Installation | \$13,000 |
| Repeater station (if necessary) | <u>\$11,000</u> |
| Total (incl. taxes) | \$75,000 |

Installation costs are high due to antenna installation on existing towers.

SUMMARY

Alternative 5 was chosen as the preferred option. Initial starts up costs are slightly higher than the other options however, the annual operating costs are minimal and, as such, less expensive over the long term. It should be noted that Alternative 3 does not have an annual operating cost however, the access to the data is severely restricted and, as such, would not meet CRD Water Services requirements.

As we were only recently notified that cellular analog service would be discontinued May 31, 2007, the costs were not included in the 2007 Capital Budget. In addition, immediate selection of the preferred alternative was also required since there was a 6 week order delay for the required UHF radio equipment.

The UHF radios being purchased are fully compatible with all equipment at the hydro-met sites. The Ministry of Forests and Range also use these radios for many of their fire weather stations throughout the province and highly recommend them. These radios are ruggedized and meant to withstand adverse conditions, such as 100% humidity and cold weather operation. The UHF radios use the latest technology and will improve the communication system currently in place as well as the telemetry coverage in the watershed.

The work will be funded from the Capital Budget.

RECOMMENDATION

That the Regional Water Supply Commission receive the staff report for information.

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