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# District of Lantzville

## REPORT TO CAO

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Special Council Meeting Agenda Item  
July 20, 2015

File No. 5600-08  
Q: Reports/2015/Wellfield Mgt Plan Stage 2

**AUTHOR:** Fred Spears, Director of Public Works

**SUBJECT:** Wellfield Management Plan Stage 2

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### Recommendation

THAT Council receives the Wellfield Management Plan Stage 2 report, for information.

### Purpose

To provide Council with results pertaining to Stage 2 of the Wellfield Management Plan.

### Background

A formal review of the District's Wellfield Management Plan and Water Quality Assessment was last completed in 2002. During the 2014 financial planning process, a Wellfield Management Plan project was approved by Council for 2014 with a total budget of \$65,000. The original project consisted of two stages as follows:

#### Stage 1 (estimated cost \$40,000)

##### Phase 1:

- Review existing data and reports
- Undertake a site visit to measure and record data
- Compile data and determine well yields and aquifer capacity
- Undertake pump tests to determine interference levels
- Identify potential improvement options

##### Phase 2:

- If warranted, based on findings in Phase 1, drilling of new test well within the existing wellfield.

#### Stage 2 (estimated cost \$25,000)

- Identify upgrades required to provide fire flows for existing and future growth and costs associated with same
- Identify whether new standards are warranted for connection capacity to the municipal water system
- Identify total storage capacity required to meet maximum daily demands if additional connections were added to the system

Council, at its regular meeting held June 23, 2014, awarded the contract for Phase 1 of Stage 1 of the project to Lowen Hydrogeology Consulting Ltd. in the amount of \$17,024, with findings to be presented to Council before proceeding with Stage 1-Phase 2 or Stage 2 of the project.

As identified in a previous report to Council, at its regular meeting held January 26, 2015, Phase 1 of Stage 1 was completed by Lowen Hydrogeology Consulting Ltd. The two main conclusions from the report that Lowen Hydrology submitted were:

1. Drilling additional well sites in the Harby Road wellfield is not advisable, and
2. Existing wells and pumping equipment should be reviewed with the objective of maximizing the wellfield production capacity as the existing wells and pumps cannot produce the ultimate potential yield.

The report also identified additional conclusions and recommendations as follows:

1. Well #6 intersects the smallest aquifer thickness (1.3m) and it is possible this well was not drilled deep enough.
2. We understand that the flow rate at Well #6 was reduced because the well produces sand when pumped at its rated capacity. The well screen design for this well may be faulty.
3. The District's dataloggers record well water levels to the nearest decameter. This accuracy should be increased to the nearest centimeter. Analyzing drawdown graphs would be greatly facilitated by the improved accuracy.
4. The District is keeping good records of cumulative production; this should be continued. Records of production from individual wells should also be maintained.
5. It appears that some wells may benefit from redevelopment work. This analysis should be refined in the next phase of wellfield work.
6. Considering previous well testing as compared to this study, several options are available to maximize the production capacity of the existing wellfield. Proposed actions to reach the long-term yield for each of the wells are as follows:
  - Well #4 May need a larger pump.
  - Well #6 Consider drilling new well.
  - Well #9 May need re-development and a larger pump.
  - Well #12 Lower the pump to top of the screen and may need a larger pump.
7. The District of Lantzville should initiate a program to evaluate and carry out the proposed strategies to maximize the production potential of the Harby Road Wellfield.

In addition to the above, Council, at its regular meeting held on January 26, 2015, directed staff to engage Lowen Hydrology Consulting Ltd. to develop a rehabilitation plan for the Harby Road Wellfield at a cost of \$6,200 plus GST and, have Koers and Associates carry out the works associated with Stage 2 at an estimated cost of \$27,500.

### **Discussion**

The Wellfield Management Plan Stage 2 has been completed. The attached study identifies numerous issues and provides recommendations to deal with those issues for the District's water supply and distribution system. A few of those recommendations are as follows:

- Adopt the system improvement projects listed in Table 31;
  1. Replace Well No. 6;
  2. Redevelopment of Wells No. 4, 9 and 12;
  3. Secure a Groundwater Licence for each well;
  4. Replace the Upper Pressure Zone (Aulds Road) Reservoir;
  5. Carry out various water main upgrades to increase fire flow.

- Expand the capture of water in the wellfield aquifer to the long-term safe yield of 2424 cubic metres per day by carrying out the Water Supply Capacity Improvements identified in Table 31;
- Monitor, test and evaluate the effectiveness of the wellfield improvements to confirm if target safe water yield is being delivered to the system;
- Monitor, test and evaluate the impacts of the new wellfield improvements on the aquifer to determine if aquifer levels are being maintained in a sustainable fashion;
- Review land use activities within the aquifer recharge zone to mitigate potential impacts;
- Increase the upper zone storage capacity and raise the top water level to 160 metres from the current 143.6 metres.
- Implement wellfield and storage improvements and storage upgrades, and confirm their effectiveness before considering any changes to the current system design standards.

Staff will bring forward a report in the fall identifying a laid out plan for Council's consideration to carry out the recommendations of the attached study.

**Financial Implications**

N/A

**Summary**

The Wellfield Management Plan and Water Quality Assessment project approved in 2014 has now been completed. Both the Wellfield Management Plan and the Water Quality Assessment has now been combined into one Water Supply and Distribution Study. This study contains recommendations on how to move forward, as it pertains to upgrades to the District's water system, that will provide the District with improved fire flows and potential room for growth.

Respectfully submitted



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**Fred Spears**  
**Director of Public Works**  
**District of Lantzville**

Reviewed By:

CAO		Dir. Fin Services		Dir. Corp. Adm.		Comm. Planner	
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