



REGIONAL
DISTRICT
NORTH
OKANAGAN

STAFF REPORT

TO: Electoral Area Advisory Committee

File No: 22-0403-C-TA

FROM: Planning Department

Date: November 25, 2022

SUBJECT: Subdivision Servicing Amendment Bylaw No. 2930 – Feedback Received

RECOMMENDATION 1:

That it be recommended to the Board of Directors, the report titled Subdivision Servicing Bylaw Amendment No. 2930 – Feedback Received dated November 25, 2022 be received, and further;

That additional Community Works Funding be secured to include a review by Golder Associates Ltd. of the technical feedback received through the referral process for Subdivision Servicing Amendment Bylaw No. 2930; and further,

That further consideration of Bylaw 2930 be deferred until Golder Associates Ltd. has completed the review and has provided recommendations on how to address the feedback received through the referral process.

RECOMMENDATION 2:

That Golder Associates Ltd. be requested to continue and augment the groundwater monitoring program as recommended in the Keddleston Groundwater Study – Phase 2 report for at least one additional year; and further,

That Golder Associates Ltd. be requested to review the data collected through the extended groundwater monitoring program to determine if a numerical groundwater flow model can be developed to provide a technical basis to support decision making regarding the sustainability of additional development in the Keddleston study area.

BACKGROUND:

At the Regular Meeting of the Board of Directors held on February 19, 2020, the Board resolved that staff be directed to develop a work plan to undertake a comprehensive review of the water supply in Aquifers 350 and 351 in Electoral Area “C” of the RDNO. Golder Associates Ltd. (Golder) was retained to complete the two phase study and the final report titled *Keddleston Groundwater Study – Phase 2* (the Golder Report) was endorsed by the Board of Directors at the Regular Meeting held on July 20, 2022.

At the Regular Meeting held on July 20, 2022, the Board gave First Reading to Subdivision Servicing Amendment Bylaw No. 2930, 2022 which, as recommended by Golder, include the following changes to the proof of water requirements for subdivisions within Electoral Area “C” that are proposing to use groundwater sources:

- At least one year of continuous groundwater level monitoring be conducted and the results analyzed and interpreted by a Qualified Professional;
- Well pumping tests must be supervised by a Qualified Professional;
- 48-72 hour pumping tests at the current bylaw rate of 6,550 litres of water per day (1.0 Imperial Gallon per Minute) per parcel, depending on the aquifer type;
- Water level recovery must be monitored for the same period of time as the pumping test (48-72 hours) and achieve 90 to 95% recovery;
- At least one observation well must be monitored in the same aquifer and within the same fracture network, during the pumping test and recovery period;
- Pumping tests are to be conducted in the dry months of the year (August 1st –March 1st);
- Where an application to the RDNO includes more than one proposed lot, the pumping test must be conducted simultaneously at all wells proposed to service each lot;
- A Qualified Professional must submit a signed and stamped hydrogeological report and Schedule A: Qualified Professional - Proof of Water form confirming all requirements of the Bylaw have been met.

The Board further resolved to forward the Bylaw along with the *Keddleston Groundwater Study – Phase 2* report to internal and external agencies, stakeholders and the public. On July 29, 2022, staff sent a referral letter to provincial ministries, local governments, First Nations, other RDNO departments, Hydrogeologists, Surveyors, Electoral Area “C” Advisory Planning Commission members and all in stream land use and subdivision applicants. Additionally, staff created a webpage (<https://www.rdno.ca/keddleston>) to provide an opportunity for residents to access the Keddleston Groundwater Study, the Keddleston Groundwater Study – Phase 2 and Subdivision Servicing Amendment Bylaw No. 2930. The website was visible on the RDNO websites but no advertisements were placed or social media campaigns ran.

The RDNO accepted referral comments through email or through an online web form. 18 comments were received. Feedback received through the referral process sited a number of concerns regarding the feasibility of conducting well tests to the level recommended in the Phase 2 Report. As a result of some of the feedback comments requesting additional stakeholders be provided an opportunity to comment and more time to review the proposal, staff sent out additional referrals targeting well pump drillers and installers and extended the referral period until November 15, 2022. 4 additional responses were received for a total of 22. Feedback is provided as *Attachment A* and redacted in accordance with the *Freedom of Information and Protection of Privacy Act*.

DISCUSSION:

Staff are proposing that additional Community Works Funding be secured to include a review by Golder of the feedback received on technical challenges identified in the proposed bylaw requirements prior to additional consideration of Subdivision Servicing Amendment Bylaw No. 2930. Additionally, staff recommend that Golder continue to monitor the observation wells outlined in the Phase 2 study for at least one additional year.

Feedback Received

Verbatim feedback is provided in *Attachment A* and included the following summary of supportive comments:

- Supportive of the alignment with provincial standards;
- Suggestions of a moratorium on any further development until existing properties have sufficient water;
- Commend the RDNO for taking protective measures for development proposing to use groundwater sources;
- Amendments align with provincial interests; aquifers require protection and water quantity is a limiting factor;
- Suggestions to apply proof of water requirements at Building Permit stage to capture subdivisions approved before the Bylaw is Adopted;
- Cautious approach is warranted based on the Aquifer characteristics and the aspects Golder revised between the Phase 1 study and the Phase 2 study.

The following is a summary of the concerns received:

- No technical justification for one year of monitoring and pumping tests
- Add to upfront costs without addressing the uncertainty of the bedrock aquifer groundwater supplies where some properties can be developed and have a reliable well while other nearby properties do not have sufficient groundwater available
- Concerns with the Bylaw applying to areas outside of Keddleston
- Concerns that the RDNO only sought industry feedback from two Hydrogeological Consultants and no Well Drillers or Pump Installers (initially)
- Concerns that insurance underwriters for Qualified Professional Hydrogeological Consultants will not approve the standardized certification documents
- How many wells can be feasibly tested simultaneously? Subdivisions will be limited in lot count in accordance with this number. Simultaneous well pumping is without precedent and operationally next to impossible
- Availability of testing hardware to conduct this testing. (Testing pumps, generators) Well pump installers do not possess the resources for undertaking multiple simultaneous tests. A single well requires not only a pump, but the pipe, electrical controls, generators, flow meters and the personnel to carry it out.
- The bar for proof of water is being raised to a point where it is no longer going to be possible, from logistical, technical and cost standpoints, for additional subdivisions to occur. A moratorium in disguise.
- Majority of the aquifers in this area in bedrock, with the recharge area and recharge times not modelled to assess what one year's data would provide value to and how the data would be connected to pumping and other influences in the hydrologic cycle
- Length of pumping required (48-72 hours) does not reflect daily residential water use
- Concerns regarding the observation well: What is the objective for monitoring? If it is to assess, aquifer impacts, then yes this is a good idea but if it is to assess potential well interference to/from neighbouring properties, then it would be better to monitor neighbouring wells.
- The requirement to verify an observation well is in the same fracture network as a pumping well may be difficult to achieve owing to the largely unpredictable nature of fractured bedrock aquifers
- Spacing requirements between new and existing wells are established by a professional to reflect the topography and makeup of the alluvial aquifer as opposed to a "one format fits all". ie 100 m

Additionally, suggestions received through the feedback process included proposing that the RDNO consider a community water system or allow cisterns be used in the area that homeowners could fill through another source.

Alternate Recommendations

Staff provide the following Alternate Recommendations for consideration and direction by the Board:

1. The Board of Directors could choose to gather additional public feedback at this time prior to Golder reviewing the technical concerns raised. Bylaw 2930 could be referred, either through a public hearing process or staff collecting written submissions, with notice requirements posted in accordance with the Public Notice Bylaw and advertised through the newspaper, the RDNO website and social media.
2. The Board of Directors could resolve to defer further consideration of Bylaw 2930 until one additional year of monitoring data is collected and reviewed by Golder (instead of bringing back Bylaw 2930 for further consideration after the technical review of feedback).
3. The Board of Directors could give Bylaw 2930 Second and Third Readings and Adoption to require new applicants to meet the threshold proposed by Bylaw 2930 immediately. The Bylaw could be amended once a technical review is completed if the Board chooses.

LEGAL/STATUTORY AUTHORITY/REQUIREMENTS:

In accordance with Section 506(1)(c) of the *Local Government Act*, a local government may, by Bylaw, regulate and require the provision of works and services in respect to the subdivision of land, and for that purpose may, by Bylaw, require that, within a subdivision, a water distribution system, a fire hydrant system, a sewage collection system, a sewage disposal system, a drainage collection system or a drainage disposal system be provided, located and constructed in accordance with the standards established in the Bylaw.

Further, in accordance with Section 506, a Subdivision Servicing Bylaw is permitted to have separate thresholds for different areas with different circumstances and if there is no community water system, may require that each parcel to be created have a source of potable water having a flow capacity at a rate established by bylaw.

For any existing subdivision applications that have already been submitted, Section 511 of the *Local Government Act* states the Bylaw has no effect with respect to that subdivision for a period of 12 months after the Bylaw is adopted. There are approximately seven subdivision applications within Electoral Area “C” at the time of writing this report that will have a one year period of time once the bylaw is adopted to advance under the existing regulations.

A public hearing is not a requirement when amending or adopting a Subdivision Servicing Bylaw in accordance with the Local Government Act. However, the Board of Directors could resolve to hold a public hearing to gather further public input.

Attachments

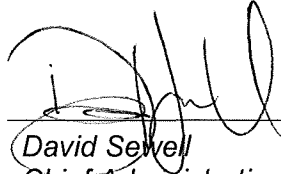
Attachment A – Feedback received through the referral process for Bylaw 2930

Submitted by:



*Rob Smailes, MCIP, RPP
General Manger, Planning and Building*

Approved for Inclusion:



*David Sewell
Chief Administrative Officer*

1. [REDACTED]

I fully endorse the proposed amendment to align with provincial standards. Area "C" along with the rest of the North Okanagan, is only going to see greater and greater development pressures (residential or agricultural) with water being the foremost of importance. I am pleased to see the RDNO take this leadership approach to ensuring water access for the future.

2. [REDACTED] – Hydrogeologist

As a former resident of Keddleston Road (2004 to 2013) and a local hydrogeologist, I read the proposed Bylaw amendments and could not help but come to the conclusion that RDNO instead should simply no longer allow subdivisions in Electoral Area "C" although passage of the bylaw will likely have the same affect (except, perhaps, with the occasional 1-lot subdivision from a larger parcel). One year of water level monitoring and simultaneous pumping tests (for which there is no technical justification available in the literature) merely add to developer's upfront costs without significantly addressing the uncertainty of bedrock aquifer groundwater supplies where some properties can be developed and have a reliable well while other nearby properties do not have sufficient groundwater available.

3. [REDACTED]

- Why haven't I heard ANYTHING about this Before hand.
- Why wasn't I contacted in any way.. about this issue.
- Why was the first reading read with out notification
- Why wasn't the report made available to residents before the first reading
- Is there a hidden addenda... it sure seems like it.
- Who PAYS for these costs .. this is not cheap. Multiple tests per year.
- It shouldn't be come by law untill. AFTER a trial period of tests. If the tests are in conclusive after a few years then this needs to be dropped.. but a trial period HAS TO BE INCORPORATED.. ONE STUDY IS NOT ENOUGH.
- are the costs on the home owners or city.

NONE of the above has been brought to my attention.. EVER...

I suggest you contact me urgently

4. [REDACTED]

The proposed by-law notes the Keddleston area but is proposing to affect all of Electoral Area C. This has not been made clear to those living outside of the Keddleston area. Everyone in area C needs to informed clearly of the proposals. I think the proposal comments time frame should be extended and a seperate notification be re-issued with a clearer headline and description.

5. [REDACTED]

Fully support proposed amendments

6. [REDACTED]

Why not allow water holding tanks like many other districts. That way if water becomes an issue for the homeowner they just fill up the tank from another water source. Many places up north operate this way, with no well, only holding tanks. Dawson Creek area as an example.

7. **Nodding Hill Developments Ltd**

We are recently in receipt of the enclosed RDNO Planning Department's letter dated July 29, 2022 which seeks feedback to Subdivision Servicing Amendment Bylaw No. 2930 – Proof of Water Requirements in Electoral Area "C" and we duly note that although the proposed changes specifically affect Qualified Well Drillers, Qualified Well Pump Installers, and Qualified Professional Hydrogeologists; it would appear that the RDNO has only sought industry feedback from two Qualified Professional Hydrogeological Consultants and has not provided direct referral to any Qualified Well Drillers or Qualified Well Pump Installers.

Upon review of the proposed changes to the Subdivision Servicing Bylaw we have concerns relating to feasibility, financial hardship, and the potential for a de facto moratorium on development in Electoral Area "C".

Accordingly, we raise the following questions and concerns:

- 1) Has the RDNO consulted with other Qualified Professional Hydrogeological Consultants in the Okanagan, apart from Golder Associates, to determine which consultants, if any, are prepared to conduct and certify testing to the proposed standards? Specifically, will Applicants seeking to pursue a subdivision actually be able to find and hire a consultant to perform the work necessary to satisfy the proposed new standards?
- 2) Has the RDNO prepared a list of Qualified Professional Hydrogeological Consultants who have confirmed that they will conduct and certify the scope of work prescribed under the proposed new standards?
- 3) Has the RDNO confirmed that insurance underwriters for Qualified Professional Hydrogeological Consultants are satisfied with the proposed standardized form letter and that Qualified Professional Hydrogeological Consultants are prepared to complete and affix their Professional seal to the proposed standardized form letter.
- 4) Is Golder Associates, the author of the Keddleston Groundwater Study – Phase 2, prepared to conduct and certify the scope of work prescribed under the proposed

new standards for Private sector clients, be it for a 2 lot, 10 lot, or +20 lot subdivision.

- 5) How many wells can be feasibly tested simultaneously?
 - 6) Should changes to the Subdivision Servicing Bylaw be adopted, subdivisions which propose the use of Drilled Wells as a source of potable water will be limited in lot count to the maximum number of wells that can be feasibly tested simultaneously. What is this maximum number?
 - 7) What is the availability of the testing hardware necessary to conduct pump testing? Has the RDNO investigated how many testing pumps Qualified Well Pump Installers have readily available and how many suitably sized generators are available for rent from local Equipment Rental companies?
 - 8) Cost Analysis – what is the estimated financial impact of the proposed new standards on an incremental cost per well.
- Costs include:
- i. Lease and installation of 1 pump and 1 generator per well.
 - ii. Purchase and installation of non-reusable 1-1/4" PVC pipe to conduct the 48/72 hour pump test (in our experience a typical well requires on averages 300ft per well although more is often required).
 - iii. Purchase of 1 water level monitor (transducer) per well and billable time for the Qualified Professional Hydrogeological Consultant to setup and quarterly retrieve water level data for a period of one year.
 - iv. Analysis and reporting costs to retain the services of a Qualified Professional Hydrogeological Consultant.
 - v. Landowner carrying costs attributed to the additional time required to conduct 1 year groundwater level monitoring before a subdivision can be completed.

As many of the above issues relate to the direct feasibility of satisfying the proposed Bylaw requirements, we request a written reply to the following items:

- 1) Has the RDNO conducted a feasibility assessment to review the practical application and financial implication of the proposed bylaw changes? If yes, we request that a copy be provided.
 - 2) A list of Qualified Professional Hydrogeological Consultants, available for hire from the Public sector, who have confirmed that they are prepared to conduct and certify the scope of work prescribed under the proposed new standards.
 - 3) Confirmation that Golder and Associates is prepared to conduct the necessary testing, reporting, and certification for Private sector clients to the standards proposed; be it for a 2 lot, 10 lot, or +20 lot subdivision.
 - 4) What is maximum number of wells that can be feasibly tested simultaneously?
 - 5) What is the forecasted increase to new housing costs upon implementation of the proposed bylaw amendment?
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8. [REDACTED]

Hello, I am the owner of a property mentioned in this report that must truck water. The drilled wells on my property are dry. I suggest a complete moratorium on any further development until such a time when all existing properties are supplied with sufficient water. This could be from a community well supplied by the aquifers in this study, or working with the City of Vernon to add the Foothills PZ865 reservoir that would also service the Keddelston area (as outlined in the Foothills Neighbourhood Plan on City of Vernon website:

<https://www.vernon.ca/homes-building/neighbourhood-planning/supplementary-plans>

I have investigated digging a shallow well on an easement with an old cattle watering dug out, but the Water Sustainability Act of 2016 and environmental rules have made it impossible. A dug well needs to be in a water producing area and those areas are now classified as wetlands thus protected from ground disturbance. Again, I suggest a moratorium until all existing homes have adequate water, then the amended Bylaw No. 2600 implementation.

9. [REDACTED] – Well Pump Installer

I am a certified and registered well pump installer that specializes in performing pumping tests to determine well yield. I am also the contractor that Golder used to collect the data for their study of the Keddelston area. I have an intimate knowledge of the groundwater challenges, having worked on a number of the wells in that entire area. My company (Monashee Aquifer Testing) even drilled a number of the wells over the years.

I am absolutely in favour of proper stewardship of groundwater, and a robust legislative framework for assuring proper allocation, but this bylaw amendment has a number of areas of concern.

Firstly, the notion of simultaneous well pumping is without precedent, and is operationally next to impossible. As a contractor, I do pumping tests all the time, and a single well requires not only a pump, but the pipe, electrical controls, generators, flow meters and the personnel to carry it out.

I can tell you, that we do not possess the resources for undertaking multiple simultaneous tests, nor would it be remotely economically feasible to do so. This proposal is functionally untenable.

As a pump installer contractor, I must navigate an obfuscated and apparently arbitrary set of criteria for minimum required well yields, with area requirements differing (Why should a Silver Star resident require more water than a Cherryville resident?) . Furthermore, I have regularly encountered building permit office staff that are completely unaware of the existing requirements for minimum well yields. Customers are being given

contradictory information when exercising due diligence in meeting the existing statutory requirements for well yields, forcing the question, Why make it more complicated?

As someone with an academic background in health sciences, I am apt to place a great deal of importance upon solid evidence when researching best practices; while I do not possess the academic credentials to question the methodology or the science behind this bylaw, I note the dearth of scientific references in support of the conclusions upon which this bylaw is being based.

I would implore you to directly solicit input from the geoscientific community and from the pumping contractors before creating requirements that will be impossible to meet.

10. 

- 1) ensure that this amendment applies to dug wells as well as drilled wells
 - 2) ensure that spacing requirements between new dug wells and pre existing neighbouring dug wells are established by a professional hydrologist to reflect the topography and makeup of the alluvial aquifer as opposed to a “one format fits all” ..ie 100 m.
 - 3) ensure that all residents in area C be notified by email or Canada Post of any and all water supply related issues . That would include notification to all residents of any proposed development and the aquifer that it would tap into.
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11. **Dan Gare Drilling**

I don't like the proposed changes and don't think they will be a benefit to Area C. Area C does have some challenges with water in some places. Keddleston Rd is a bit hit and miss, Jackpine Rd, Aspen Rd almost no water at all there. There is many more areas that have abundant water, even artesian flows and some sand and gravel aquifers are present. Proposing that water levels be monitored for a year adds tremendous cost and isn't really possible/helpful for subdivisions that would include an active well. Proposing all the wells be pumped at once is very difficult/impractical if the subdivision was large and doesn't allow to see potential well interference between wells. Maybe a simpler solutions with less detrimental effects would be to keep current policies in place and raise the minimum water requirement to 2 lmp gpm (13,100 litres per day) to help stop development in areas with marginal water supplies. Thanks for considering!

12. **Interior Health Authority**

We commend the Regional District of North Okanagan for taking these additional protective measures for land use development proposals proposing to use groundwater sources. We would additionally offer that the Regional District may want to consider including reference to the Guidance Document for Determining Groundwater At Risk of Containing Pathogens (GARP) within the amended bylaw.

13. [REDACTED] – Hydrogeologist

Hello, I am a hydrogeologist with Western Water based in Vernon and have reviewed the proposed amendments to the RDNO subdivision servicing Bylaw in Electoral Area C. My partner Doug Geller previously provided technical comments on the proposed changes that I am in agreement with. I won't repeat those here in detail but in brief, those included issues with testing wells in the dry part of the year and expecting full recovery when recharge is not occurring, and complications with assessing well interference when running multiple wells at the same time.

Under the proposed changes to the Bylaw, I think the bar for proof of water is being raised to a point where it is no longer going to be possible, from logistical, technical and cost standpoints, for additional subdivisions to occur, other than perhaps the occasional one or two lot subdivision. I would estimate the cost of completing a subdivision proof of water study for say a three lot subdivision would triple or more from the current costs incurred by a proponent. There are several issues with the proposed change requiring all wells to be pumped simultaneously. As mentioned, it will be nearly impossible to adequately discern and characterize well interference effects. In the case of monitoring offsite wells in the area, if interference effects are observed, we could not determine whether the interference was a result of pumping all the wells or just one of the wells. Further, it is logistically challenging to pump more than three wells at the same time. Well pump contractors are not set up for that. In my career, I have not been involved in a project where more than two wells have been purposely pumped simultaneously for a controlled pumping test.

Lastly, I have issues with the proposed certification document. This particular certification stops short of requiring me to certify with my seal that a given well will meet the Bylaw quantity requirement in perpetuity (which I have seen in other local government bylaws and which I will not sign). I provided this proposed RDNO document to our insurance provider for comment. It was recommended to me that I not sign certification documents like this until our insurance underwriter was given opportunity to review and approve.

As a professional of record, it is unlikely I could design and execute a proof water program that would fully satisfy the proposed Bylaw requirements for anything more than a two lot subdivision. Rather than take on a project I knew I would not be able to adequately complete, I would likely decline future opportunities in this area.

14. [REDACTED]

When we purchased our property on Keddleston Road, over 20 years ago, our plan was to one day subdivide and build a 2nd dwelling for our daughter. Creating a family homestead was our goal. I believe many people in the Keddleston neighbourhood have similar goals and values. The requirement to prove high-producing wells in order to rezone or subdivide, and test for a full year, represents an impossible barrier. I say high producing, since 1 gallon per minute is high in comparison to what previously drilled wells

in the area have produced - on average, 0.5 gallons per minute (according to the well logs presented in the study).

Our home functions very well with a low producing well. Our solution is a 3000 gallon cistern and we regularly tank in water. We estimated that when we were a family of 3, with 3 horses, and other critters too, we tanked in 3000 gallons of water every 4 - 6 weeks at the height of the dry season and at other times of the year, we filled the cistern about every 8 - 10 weeks. This is a far cry from 1 gallon per minute which equates to 1,440 gallons per day! And, there is no guarantee a well that produces 1 gallon a minute today, will produce that amount 2 years from now.

I believe RDNO could better support rezoning and subdividing in Area C by including installations of clean, approved/regulated cisterns within this bylaw. Well water can be pumped into a cistern and stored for use and additional water requirements can be addressed by water delivery. Currently, we have 2 water suppliers in our area. I would also suggest that water become a regulated utility. By permitting the use of cisterns, we open the area to families who are taking care of their families. With the housing shortage impacting so many families, the limitations of this bylaw may continue to fuel that situation, not to mention drilling a costly well and the amount of testing that will be required. Having an option to install cisterns and utilize the water delivery services would be an efficient and economic solution for the Keddleston area water situation.

15. [REDACTED]

I've taken the time to contact professionals that are trained and work in the drinking water industry which includes testing wells. I was surprised to learn that the ones are contacted were not aware of this proposed amendment.

After sharing the document, I was not surprised at the comments made to me: primarily, that this was outrageous, not well thought out and near impossible to adhere to. This proposed amendment is a moratorium in disguise.

With reference to the Water Sustainability Act

This Act is current to August 24, 2022

See the Tables of Legislative Changes for this Act's legislative history, including any changes

not in force.

Water Sustainability Act

[SBC 2014] CHAPTER 15

(8) Despite subsections (1) to (6), a person to whom section 6 (4) [use of water — excluded

groundwater users] applies is deemed to have rights that have precedence under those subsections, as if the deemed rights were granted under an authorization that

(a) sets out as the date of precedence the date of first use of the water, and

(b) authorizes the use of the greater of

(i) 2 000 litres of water per day for each private dwelling on a parcel, or

(439.93 imp. gallons)

(ii) the amount of water the engineer is satisfied the person has been using for domestic purposes.

16. Splatsin

Splatsin asserts Aboriginal rights and title in Secwepemculucw. As the Project falls within this area, any potential impact arising from the Project or cumulative impacts resulting from the Project on Splatsin's Aboriginal rights and title will trigger the duty to consult and accommodate Splatsin.

Given the extent of cumulative impacts in Splatsin's traditional territory, even a small project may have serious consequences for the exercise of our constitutionally-protected rights and title and may therefore require deep consultation and accommodation. Further, Splatsin asserts Aboriginal and other common law rights to the lands and water resources within, under, and adjacent to our reserve lands, and Splatsin has the right to govern those lands and water resources. To the extent the Project potentially impacts Splatsin's reserve land and/or water resources and/or Splatsin's ability and authority to govern our reserve lands and water resources, the duty to consult is engaged at the higher level, including the requirement to obtain Splatsin's consent.

Splatsin did not have the capacity to respond to this referral during the engagement period. Please notify us of any decisions that were made on this file and forward any monitoring reports, if applicable.

17. Township of Spallumcheen

- These regulations seem quite demanding; however considering that the aquifers require protection from contamination and that water quantity is a limiting factor, the proof of water requirements would be warranted.
 - The proposed requirements align with Provincial interests.
 - It is noted that the Golder report did not consider the portion of Provincially mapped aquifer #351 within Township boundaries. In future, collaboration between adjacent communities should be considered when commissioning a report of this nature in order to ensure that the overlapping community interests of groundwater supply are taken into account.
 - The Township would be interested in having Golder present the findings of this report to our Council as our municipality is adjacent to Area C, and several Township properties lie above aquifer #351.
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18. [REDACTED]

I don't think the groundwater study on Keddleston Rd covers enough area to make changes to all of area C.

19. [REDACTED]

I am writing to request some clarification re: Subdivision Servicing Amendment Bylaw No. 2930 – Proof of Water Requirements in Electoral Area “C”. Would this only apply to new wells? Or existing wells? In June 2022, RDNO approved a subdivision which draws from three new wells which draw from the same water source as properties located on Jordashe Rd. I would request that before building permits are issued on Lots 1-5 and R20, the proof of water requirements would apply. Last year, our wells (Jordashe residents) were dry from July to October. I'm pretty certain any additional stress placed on this aquifer would result in future water shortages.

20. **Advisory Planning Commission Minutes**

- Unreasonable requirements in the report.
 - No one is set up in the valley to test to the volume required.
 - Need to look at community development / community water system.
 - Need to protect people already in the area.
 - We are adding a hardship to prove water.
 - Would like to see more consultation with people in the industry and the referrals for the report should have been sent to more people.
 - Do not want to put a moratorium on the area.
 - Feel that this study would be the same as a moratorium and that maybe a moratorium should be placed in areas.
 - Stricter testing should be in place.
 - Need more time to provide feedback.
 - Have people provide input through planning @rdno.ca.
 - Email APC members not in attendance at meeting to provide feedback.
 - Would like this report to come back to a future APC meeting for further discussion.
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21. [REDACTED]

Overall, the proposed amendments are not supportive of developing the area. If it is RDNO's goal to reduce development of the area, then the proposed amendments should help with that goal.

Comments for the specific bullets are as follows:

-At least one year of continuous groundwater level monitoring be conducted, and the results analyzed and interpreted by a Qualified Professional;

What is the RDNO expecting to assess from one year's data? Impacts to the aquifer from residential pumping? Majority of the aquifers in this area in bedrock, with the recharge area and recharge times not modelled to assess what one year's data would provide value to and how the data would be connected to pumping and other influences in the hydrologic cycle.

-Well pumping tests must be supervised by a Qualified Professional;

Yes, pumping tests should be overseen by a QP registered with EGBC.

-48-72 hour pumping tests at the current bylaw rate of 6,550 litres of water per day (1.0 Imperial Gallon per Minute) per parcel, depending on the aquifer type;

What will stipulate whether a 48 hour or 72 hour pumping test should be completed? Is 6,550 litres per day over a 12-hour or 24-hour period? Why would a 48 hour pumping test be needed instead of a 24 hour pumping test? How does this length of pumping show impacts that may be similar to daily residential water use? I believe the objective of the Bylaw is to understand whether residential water use will be supported by the aquifer and testing should also reflect the objective for residential water use.

-Water level recovery must be monitored for the same period of time as the pumping test (48-72 hours) and achieve 90 to 95% recovery;

Yes, agreed.

-At least one observation well must be monitored in the same aquifer and within the same fracture network during the pumping test and recovery period;

What is the objective for monitoring? If it is to assess, aquifer impacts, then yes this is a good idea but if it is to assess potential well interference to/from neighbouring properties, then it would be better to monitor neighbouring wells.

-Pumping tests are to be conducted in the dry months of the year (August 1 –March 1) or as identified by the one year monitoring period;

Again, majority of producing aquifers in the area are in bedrock. Recharge does not only occur during wet months and impacts from dry month pumping will likely not add additional stress to the bedrock aquifer.

-Where an application to the RDNO includes more than one proposed lot, the pumping test must be conducted simultaneously at all wells proposed to service each lot;

This adds a lot of complicated analysis that will not result in telling whether there is well interference to/from neighbouring properties. It will also put extreme stress on the aquifer that will not represent residential water use.

-A Qualified Professional must submit a signed and stamped hydrogeological report and

Schedule A: Qualified Professional - Proof of Water form confirming all requirements of the Bylaw have been met.

A QP registered with EGBC should authenticate the hydrogeological report and include the completed Schedule A as part of the report. As a professional, I would not authenticate Schedule A because the authenticated page can be inserted to any other report for any other well or property. This is a liability risk. There is no need to authenticate the information twice. The authenticated report will cover the context in Schedule.

22. David Thompson, Hydrogeologist, MoF

I have reviewed the proposed bylaw amendments and the Golder report upon which they are based (<https://www.rdno.ca/keddleston>). While there are well-known historical and ongoing concerns regarding groundwater availability in the Study Area identified in Golder's Phase 2 Report, the Province of British Columbia regulates only non-domestic groundwater use through the Water Sustainability Act. It does not presently consider local groundwater availability for new domestic wells, although the Groundwater Protection Regulation does address well construction, siting and well owner requirements.

It is understood that the professional report and related recommendations, including the proposed bylaws, are intended to support sustainable development in the Keddleston area.

The professional report is substantive in scope, and as such increases confidence in the assessment of groundwater availability, and the measures suggested to ensure sustainable use.

Technical aspects of the revised proof-of-water requirements comprising the bylaw are more comprehensive than in the past. The fact that Golder revised aspects of their Phase 1 (2020) availability study downward based on new data indicates a cautious approach is warranted. On balance, the level of effort required in the proposed bylaws appear scaled to the level of concern currently indicated by the study.

I would note that the requirement to verify an observation well is in the same fracture network as a pumping well may be difficult to achieve owing to the largely unpredictable nature of fractured bedrock aquifers. Golder were able to determine that variations in groundwater quality data may differentiate shallow and deeper fracture networks.

In the event the bylaws are passed, consideration should be given to ensuring professional reports generated because of the bylaw are readily available to future QPs working toward satisfying the proof-of-water requirements. Future reports can (and should) reference and incorporate previously submitted professional reports and data.
