City of Saskatoon
Communications & Public Engagement

ENGAGE

Options for Groundwater Protection

Final Comprehensive Engagement Report
December 1, 2021

Engagement Summary

The City of Saskatoon is developing methods to protect groundwater and groundwater users within its jurisdiction, since the installation and operation of private groundwater wells for domestic purposes is not addressed by current bylaws. Therefore, City Administration is putting forward a proposal to regulate or prohibit private groundwater wells for domestic purposes within City limits. This would be conducted through the development of a new bylaw and methods to encourage or require the decommissioning of monitoring and non-active groundwater wells on City and private properties within City limits.

Administration engaged stakeholders on relevant components of the Options for Groundwater Protection through two phases:

Phase 1: Options Identification

- The engagement goals for this phase were to develop options based on stakeholder feedback and ensure concerns/priorities were understood.

Phase 2: Close the Loop

- This phase included sharing considerations for the options with stakeholders to obtain feedback and provide the opportunity to identify red flags.

This engagement summary includes the activities and results that informed the engagement goals for the project. A total of 85 participants took part in the engagement activities, including stakeholder meetings and public surveys, from August 2021 – October 2021.

Engagement goals, intended audience, activities, dates, participation rates and detailed engagement results are provided in the Options for Groundwater Protection Comprehensive Engagement Report that follows this summary, as well as the Phase 1 What We Heard Report on the project Engage Page.

Engagement results from all activities that informed each goal are summarized below.

Importance of Groundwater Protection

When asked how important it is for the City to protect groundwater quality in Saskatoon, most participants felt it was either important (37%) or very important (54%). Similar results were found for protecting groundwater from depletion in Saskatoon, which most participants felt was either important (24%) or strongly important (54%). The following themes emerged from the comments that were provided by participants:

Contamination: is a major concern for many participants; contamination has the potential to limit the use of local aquifers by a variety of users and not protecting it now could greatly impact its future potability

Importance: many respondents feel water security and scarcity will become larger issues in the near future, therefore protecting groundwater reserves is vitally important

Jurisdictional responsibility: some respondents identified that regulating/protecting groundwater is the responsibility of the Water Security Agency and the City should not be involved

Safety: centrally treated, regulated, and distributed source water is significantly safer than unregulated supplies which require homeowners to protect and maintain the source, as well as monitor and treat the water to ensure safety standards are met.

Ranking Options for Groundwater Protection

In the first stakeholder survey, most respondents supported prohibiting domestic wells (50%), with some respondents supporting regulating domestic wells (37%) or implementing no changes (13%). When asked for their level of support with the inclusion of domestic wells for irrigation-only as a fourth option, prohibiting new domestic-purpose pumping wells received the strongest support (65%) by participants. Allowing new domestic purpose pumping wells for irrigation-only received an equal amount of support and opposition, while allowing new domestic-purpose pumping wells for all domestic users and not regulating domestic-purpose pumping wells were not supported overall.

Out of the comments provided by respondents for their reasoning, the following themes emerged:

Costs and funding: how will the regulation and enforcement of wells be resourced and funded

Health risks: centrally treated, regulated, and distributed source water is significantly safer than unregulated supplies that require the homeowner to maintain the source and monitor/treat the water to ensure safe drinking conditions

Monitoring needed: it was suggested that water wells, their installation, and water withdrawal should be regulated and monitored if domestic wells are to be allowed; there should be sound rules to follow, or else domestic-use wells should not be allowed

Source water protection: proper source water protection, maintenance, monitoring, and treatment is a large responsibility to place on the average private well owner; ineffective well management can result in numerous risks to human health and the potential for groundwater contamination

Using groundwater for irrigation: many respondents indicated that water quality from Saskatchewan aquifers is rarely good for irrigation purposes.

When asked whether prohibiting or regulating domestic wells within Saskatoon would impact their work, most respondents stated it would not (51%), followed by those stating it would (36%). Furthermore, 32% felt it would positively or somewhat positively effect their work, while 24% stated it would negatively or somewhat negatively effect their work.

Decommissioning of Non-Active Groundwater Wells

The majority of participants either supported or strongly supported the proposed actions for decommissioning non-active groundwater wells on City properties (83%), on private properties for large-scale development (78%), and on single property lots (75%). Participants were asked to rank the proposed options for well maintenance and decommissioning, which resulted in the following ranking:

1. Create an administrative policy for monitoring wells on City land
2. Create a bylaw with a city-wide standard applicable to all monitoring wells
3. Amend the development standards for large-scale development
4. Promote voluntary use of the guidelines for wells on private land

Many respondents provided suggestions for the proper decommissioning and maintenance of groundwater wells, including:

- Using pre-treated water for all drilling purposes
- Following more modern standards and best practises for decommissioning
- Decommissioning being completed by a registered driller with the Water Security Agency or Saskatchewan Ground Water Association.

Final Thoughts and Common Themes

When asked what other options the City should consider to protect groundwater in Saskatoon, respondents suggested:

- Mapping and assessing the vulnerability of aquifers within City limits
- Considering what changes in land-use could take place in areas of greater risk to aquifers
- Establishing an awareness program that demonstrates safe maintenance of wells and responsible use of groundwater.

Common themes shared throughout the engagement activities included the following themes:

Education is important: knowledge and education about groundwater is the first step towards better protection

Enforcement and monitoring: are critical for not only the success of the project, but also the protection of local groundwater resources

Limited information: many respondents identified that currently there is little information on the viability of groundwater resources, as well as groundwater quality and quantity in Saskatoon

Support: many respondents extended their support for the initiatives being described and for the City in being proactive in the protection of groundwater resources within Saskatoon

Updates to legislation: stakeholders expressed the need for provincial legislation and regulations surrounding groundwater protection to be updated.

Consideration of Results

Results from all engagement activities were considered alongside internal (City) stakeholders' feedback and best practice research to develop the options for groundwater protection in Saskatoon. Further topics that were explored can be found in this resource that was provided to stakeholders and participants. Options that were supported by all participants and by best practice research were incorporated into the recommendations or will be considered in future implementation. Examples include the following:

Aquifer protection: we acknowledge more detailed mapping of aquifers within Saskatoon city limits may be required to fully understand their viability and vulnerability at a local scale

Exploring irrigation-only wells: in response to the feedback we heard we explored options for including irrigation-only wells

Importance: it is important for the City to protect both groundwater quality and groundwater from depletion

Maintenance and decommissioning: the proposed actions for maintenance and decommissioning of monitoring wells and abandoned pumping wells on City and private property were supported, including creating an administrative policy for monitoring wells on City land

Prohibiting domestic-purpose wells: more participants felt that domestic-purpose pumping wells should be prohibited.

Communications and education campaigns will be explored following approval of the recommended options by City Council to ensure all residents are aware of the opportunities for groundwater protection and City expectations.

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1 Background

Groundwater is a natural resource that requires protection to ensure its viability is sustained for present and future users. Groundwater wells are common within and surrounding Saskatoon, either as pumping wells or monitoring wells. Wells exist on rural land planned for future development as well as on private and City properties within Saskatoon. They are often encountered during land development, redevelopment, or road maintenance by the City or private developers.

Untreated groundwater from private wells is not always safe for drinking water purposes. The City provides safe drinking water sourced from the South Saskatchewan River and is not responsible for ensuring that groundwater from private wells is tested nor treated. While City Administration does not expect there to be many residents using domestic wells on properties where City water service is available, the number of active wells in use is currently unknown. Also, the installation and operation of private groundwater wells for domestic purposes is not addressed by current bylaws in Saskatoon.

There are many benefits in protecting groundwater for Saskatoon, including improving and understanding local groundwater quality, improving awareness of groundwater and its long-term sustainability, and reducing liability to developers and the City. Therefore, the City of Saskatoon is developing methods to protect groundwater and groundwater users within its jurisdiction. City Administration intends to put forward a proposal to:

- Regulate or prohibit private groundwater wells for domestic purposes within City limits through a bylaw, and
- Encourage or require the decommissioning of non-active groundwater wells on City and private properties within City limits.

For these and other reasons, City Administration engaged internal and external stakeholders from August – October 2021 in the exploring the options for groundwater protection in Saskatoon. Based on what we heard from stakeholders, in addition to further research and internal considerations, Administration will present the options for groundwater protection to City Council in 2021.

1.1 Strategic Goals

This project supports the Strategic Goal of Environmental Leadership, contributing to responsible land and water use.

1.2 City Project Team

- Jeanna South, Project Sponsor, Sustainability
- Twyla Yobb, Project Advisor, Sustainability
- Vanessa Heilman, Project Manager, Saskatoon Water
- Kristian Hermann, Project Coordinator, Sustainability
- Mike Halstead, Marketing Consultant, Communications & Public Engagement
- Kenton Lysak, Engagement Consultant, Communications & Public Engagement

1.3 Spokesperson(s)

- Jeanna South, Director, Sustainability
- Vanessa Heilman, Project Manager, Saskatoon Water

1.4 Summary of Engagement Strategy

Internal and external stakeholders were provided the opportunity to inform the following engagement goals:

Phase 1: Options Identification

- Develop options for groundwater protection in Saskatoon using best practice research and engagement feedback
- Ask industry and public participants to identify opportunities and barriers for each option

Phase 2: Closing the Loop

- Validate findings and recommended options with stakeholder groups
- Determine the level of support for the recommended options and identify any risks.

A summary of stakeholder groups, level of engagement, engagement objectives, engagement goals and engagement activities completed are provided below.

Table 1: Summary of Engagement Strategy

Phase	Stakeholder	Level of Influence	Objective	Engagement Goal	Engagement Activities
1	Internal Stakeholders Key Stakeholders	Collaborate	Review best practise research and identify new program elements that enhance opportunities and limit barriers	Options Identification	Emails Meetings Phone Calls Survey Workshops
	Subject Matter Experts	Involve	Review program elements with a wider stakeholder base to refine new program elements and identify red flags	Options Identification	Emails Meetings Phone Calls Survey
2	Internal Stakeholders Key Stakeholders Subject Matter Experts	Consult	Share relevant components of the bylaw/policy with stakeholders to close the loop and provide opportunities to identify any red flags	Close the Loop	Emails Meetings Phone Calls Survey

A summary of engagement activities selected, activity and event dates, intended audience, and number of participants engaged for each engagement goal is provided in the table below.

Table 2: Summary of Engagement Activities

Goal	Intended Audience	Engagement Activity	Date(s)	Participants
Phase 1	Stakeholder Survey	Survey	August 9th to August 25th, 2021	51
	Stakeholder Meetings	Meetings	August to October, 2021	10
			Subtotal	61
Phase 2	Stakeholder Survey	Survey	September 28th to October 6th, 2021	24
			Subtotal	24
			Total Participation August to October, 2021	**85**

Engagement activities, intended audience, marketing techniques, analysis methods and results are described in this report followed by a summary of evaluation feedback and data limitations.

1.5 Stakeholder Groups

Three stakeholder groups were identified with the potential to be impacted by the Options for Groundwater Protection project. These groups included:

1.5.1 Internal Stakeholders

- Bylaw Compliance
- City Solicitors
- Construction and Design
- Communications and Marketing
- Parks
- Saskatoon Land
- Saskatoon Water
- Sustainability
- Technical Services
- Water and Waste Operations

1.5.2 Subject Matter Experts

- Association of Professional Engineers and Geoscientists of Saskatchewan
- Saskatchewan Environmental and Industry Managers Association
- Saskatchewan Groundwater Association
- Meewasin (includes Partners for the Saskatchewan River Basin)
- Saskatchewan Health Authority
- Saskatchewan Safe Drinking Water Foundation
- South Saskatchewan River Watershed Stewards
- University of Saskatchewan – Global Institute for Water
- Water Security Agency

1.5.3 Key Stakeholders

- Developers
- Supply well drilling companies
- Monitoring well drilling companies
- Environmental consultants
- Geotechnical consultants.

2 Engagement Activities

Stakeholders provided their feedback on the options for groundwater protection through online surveys, stakeholder meetings, or by contacting the project team directly via email, mail, or telephone.

2.1 Stakeholder Survey

A stakeholder survey was held from August 9th to August 25th, 2021 to collect feedback on the proposed changes and their potential impacts. The survey comprised a total of 19 closed- and open-ended questions. Respondents were able to write-in an "other" preference for numerous questions and provide explanations for their preferences.

2.1.1 Intended Audience

The survey was intended for all Subject Matter Experts and Key Stakeholders.

2.1.2 Marketing Techniques

Since the survey was provided directly to stakeholders the following marketing techniques were employed:

1. City Website
    a. Updates to the Engage Page were made to encourage participation in the online survey
2. E-invites
    a. Personalized emails were sent to stakeholders asking them to participate and share the information with their members
    b. Numerous associations included the e-invite within newsletters and internal outreach methods.

2.1.3 Analysis

The results were analyzed for the following indicators:

- Most popular options and recommendations (count)
- Thematic analysis of reasoning offered for inclusion of certain options over others
- Look for options that might improve or reduce accessibility and uptake

Mixed methods were used to analyze the data. Qualitative methods included the thematic analysis and open coding of responses.

2.1.4 What We Heard

Demographics

A total of 51 individuals participated in the survey with 93% operating in Saskatoon. The largest group of respondents were consultants that design wells for the monitoring or pumping of groundwater (44%) and subject matter experts (42%), followed by drillers or well installers (17%), City of Saskatoon employees (15%), and land developers (7%). Out of the respondents 73% stated they completed the survey as a representative of a businesses, organizations, or groups.

Importance of Groundwater Protection

When asked how important it is for the City to protect groundwater quality in Saskatoon, most participants felt it was either important (37%) or very important (54%). Similar results were found for protecting groundwater from depletion in Saskatoon, which most participants felt was either important (24%) or strongly important (54%). The following themes emerged from the comments that were provided by participants:

Contamination: is a major concern for many participants; contamination has the potential to limit the use of local aquifers by a variety of users and not protecting it now could greatly impact its future potability

Importance: many respondents feel water security and scarcity will become larger issues in the near future, therefore protecting groundwater reserves is vitally important

Jurisdictional responsibility: some respondents identified that regulating/protecting groundwater is the responsibility of the Water Security Agency and the City should not be involved

> *"Sask Water Security already works to manage, monitor and make recommendations for all ground water sources in Saskatchewan. domestic wells under 500 cubic decametres. It is not that there is no regulation. There is legislation and regulations already in place by Sask Water Security Agency and permits for accessing Saskatchewan's Renewable Resource."*

Updates to legislation are needed: many respondents identified the need to update the provincial groundwater legislation and requirements

Prohibiting Versus Regulating Domestic Wells

When asked whether prohibiting or regulating domestic wells within Saskatoon would impact their work, most respondents stated it would not (51%), followed by those stating it would (36%). Further to this, 32% felt it would positively or somewhat positively effect their work, while 24% stated it would negatively or somewhat negatively effect their work.

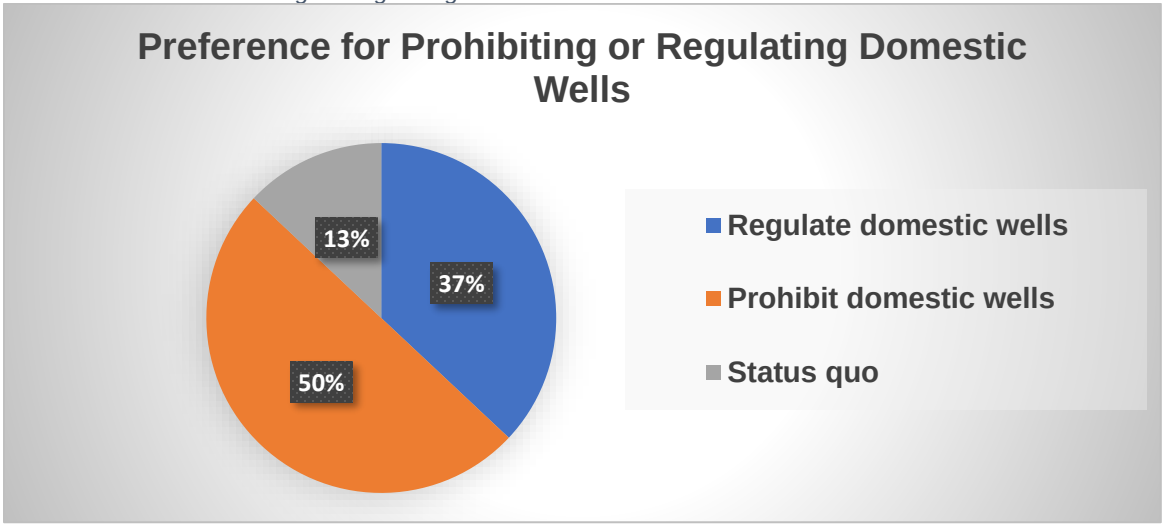
Numerous respondents provided comments as to how it would either positively or negatively effect their work, which included:

Table 3: Potential Impacts for Prohibiting or Regulating Domestic Wells

Positive Impacts	Negative Impacts
• Added education and enforcement measures could result in more work for the industry and better job security • Additional planning and considerations for the service life of installed wells • Allow for exploration of groundwater use for irrigation purposes • Easier to use Tier 2 Endpoints to assess the impacts at sites • Help to standardize the process and make it clear to future clients • The outcomes could properly address well integrity and decommissioning	• Create more work for the proper decommissioning of wells • Limiting free access to groundwater reservoirs and adding stress to municipal systems • Limit properly constructed wells, which are reliable and cost effective • More responsibility could be placed on the Water Security Agency to provide more support to private well owners • Potentially decrease the number of monitoring wells installed

Most respondents supported prohibiting domestic wells (50%), with some respondents supporting regulating domestic wells or implementing no changes.

Figure 1: Preference for Prohibiting or Regulating Domestic Wells



Out of the comments provided by respondents for their reasoning, the following themes emerged:

Contamination: improperly constructed or decommissioned wells can be hazardous and create a pathway for aquifer contamination; the City would need to ensure installed wells do not create a new pathway for contaminates between water reservoirs

Costs and funding: how will the regulation and enforcement of wells be resourced and funded

> *"If private wells within the City were to be regulated, it would require significant investment that when stacked beside the risk to human health and source water contamination doesn't seem to be a logical decision."*

Health risks: centrally treated, regulated, and distributed source water is significantly safer than unregulated supplies that require the homeowner to maintain the source and monitor/treat the water to ensure safe drinking conditions; issues of liability as it relates to contamination and human health could put the City into difficult and costly situations

> *"If people consume the water, there are significant health hazards found in raw ground water in Saskatchewan. Common hazards that exceed the Saskatchewan Drinking Water Guidelines include: arsenic, uranium, selenium, nitrate, total coliform bacteria, E.coli, and manganese. 87% of private wells tested in the province exceed in at least one health guideline so the majority of wells require effective treatment, or a minimum of continuous disinfection, to make them safe for human consumption"*

Maintenance considerations: if the City chooses to regulate then the risks associated with failure states over time need to be considered (ex. if flooding causes groundwater to be contaminated through a well)

Regulation requires further management: adaptive management (including cumulative impact assessments and establishing threshold targets), frequent water quality testing, and comprehensive monitoring should be undertaken if the City proceeds with regulating domestic wells

Decommissioning of Non-Active Groundwater Wells

The majority of participants either supported or strongly supported the proposed actions for decommissioning non-active groundwater wells on City properties (83%), on private properties for large-scale development (78%), and on single property lots (75%). Comments included the following themes:

Enforcement: owners are not held responsible for proper maintenance or the decommissioning of wells, which can result in a conduit for potential surface contamination into the groundwater; who will enforce the maintenance and decommissioning of wells and how will it be funded

Need for management: typically, the management of wells is not maintained after the initial installment, so additional regulation would be useful in protecting groundwater resources

Proper methods and standards: many respondents emphasized the importance of using proper standards and methods to decommission groundwater wells; although standards exist, many contractors do not meet them or are unaware of them

Many respondents provided suggestions for the proper decommissioning and maintenance of groundwater wells, including using pre-treated water for all drilling purposes, following more modern standards and best practises for decommissioning, and decommissioning being completed by a registered driller with the Water Security Agency or Saskatchewan Ground Water Association.

Final Thoughts

When asked what other options the City should consider to protect groundwater in Saskatoon, respondents suggested mapping and assessing the vulnerability of aquifers within City limits, considering what changes in land-use could take place in areas of greater risk to aquifers, and establishing an awareness program that demonstrates safe maintenance of wells and responsible use of groundwater. Final comments included the following:

Education is important: knowledge and education about groundwater is the first step towards better protection; it was recommended that each well owner should become familiar with their well construction, maintenance, decommissioning requirements as per provincial regulations, and overall risks associated with using groundwater

> *"Successful campaigns and regulations to ensure individuals test and treat their well water, and maintain the physical condition of the well are to my knowledge not existent."*

Jurisdictional considerations: how will the City work in conjunction with the Water Security Agency who already regulates groundwater wells in the province; there is further confusion as to whether the Water Security Agency regulates private wells, to which they do not; a push for better provincial legislation of groundwater protection would prevent greater administration and costs for the City

Limited information: many respondents identified that currently there is little information on the viability of groundwater resources, as well as groundwater quality and quantity in Saskatoon

Responsibility: some respondents expressed their confusion for why the City isn't following the provincial guidelines and requirements set by the Water Security Agency

> *"Ground water protection is not just a city of saskatoon issue. It is an everyone issue. Join, support, and be the change that you want to see. Ground water is all connected. The city of Saskatoon does not exist in a bubble."*

Support: many respondents extended their support for the initiatives being described and for the City in being proactive in the protection of groundwater resources within Saskatoon

> *"The City of Saskatoon is being proactive in the protection of the groundwater resources. I commend that the multi-barrier approach is being considered with acknowledgement of the risks from domestic water wells to the aquifers."*

2.2 Stakeholder Meetings and Comments

Stakeholders were invited to meet or provide their comments to the project team from August to September 2021.

2.2.1 Marketing Techniques

No direct marketing techniques were used since personalized emails were sent to stakeholders asking for their feedback.

2.2.2 Analysis

The data received during this activity was provided in the form of information pertaining to options for consideration by the project team. As such, no additional analysis of the data was required.

2.2.3 What We Heard

Comments provided by stakeholders were categorized into the following themes:

Be clear: whatever options are decided on, the City needs to clearly define the requirements, expectations, and definitions associated with groundwater protection in Saskatoon; using wording such as "non-active groundwater wells" can be vague and cause further confusion with the requirements

Education: it is essential that the community is well-informed on the risks associated with using groundwater for domestic uses

Enforcement and monitoring: are critical for not only the success of the project, but also the protection of local groundwater resources; currently the province does not regulate any aspect of private wells with the exception of their construction and the requirement for the driller to use a registered rig

Irrigation: Saskatchewan's groundwater is often hard which contributes to complaints surrounding corrosion and staining

Safety: centrally treated, regulated, and distributed source water is significantly safer than unregulated supplies which require homeowners to protect and maintain the source, as well as monitor and treat the water to ensure safety standards are met; one stakeholder suggested that where there exists distribution to access municipal water for domestic purposes, including human consumption, the use of private water supplies should be minimized

Source water protection: proper source water protection, maintenance, monitoring, and treatment is a large responsibility to place on the average private well owner; ineffective well management can

result in numerous risks to human health and the potential for groundwater contamination; what expectations will be set for source water protection, water testing, or well disinfection

Two-pronged approach for developers: one stakeholder suggested that taking a two-pronged approach would be best, with one prong being the City leading by example and the second being some sort of trigger to the development permit; requirements are needed on the front-end for developers to clearly follow; would be beneficial to transition this into the building permit process and eventually the operating permit

Updates to legislation: stakeholders expressed the need for provincial legislation and regulations surrounding groundwater protection to be updated; this includes updating requirements to prevent contamination of aquifers, using treated water throughout the drilling process and looking at best practise research from other provinces

2.3 Feedback on Options Survey

A stakeholder survey was held from September 28th to October 6th, 2021 to collect feedback on the proposed changes and their potential impacts. The survey comprised a total of five closed- and open-ended questions. Respondents were able to write-in an "other" preference for numerous questions and provide explanations for their preferences.

2.3.1 Intended Audience

The survey was intended for all Subject Matter Experts and Key Stakeholders, as well as past participants.

2.3.2 Marketing Techniques

Since the survey was provided directly to stakeholders, the following marketing techniques were employed:

1. City Website
    a. Updates to the Engage Page were made to encourage participation in the online survey.
2. E-invites
    a. Personalized emails were sent to stakeholders asking them to participate and share the information with their members.
    b. Numerous associations included the e-invite within newsletters and internal outreach methods

2.3.3 Analysis

The results were analyzed for the following indicators:

- Most popular options and recommendations (count)
- Thematic analysis of reasoning offered for inclusion of certain options over others
- Look for options that might improve or reduce accessibility and uptake

Mixed methods were used to analyze the data. Qualitative methods included the thematic analysis and open coding of responses.

2.3.4 What We Heard

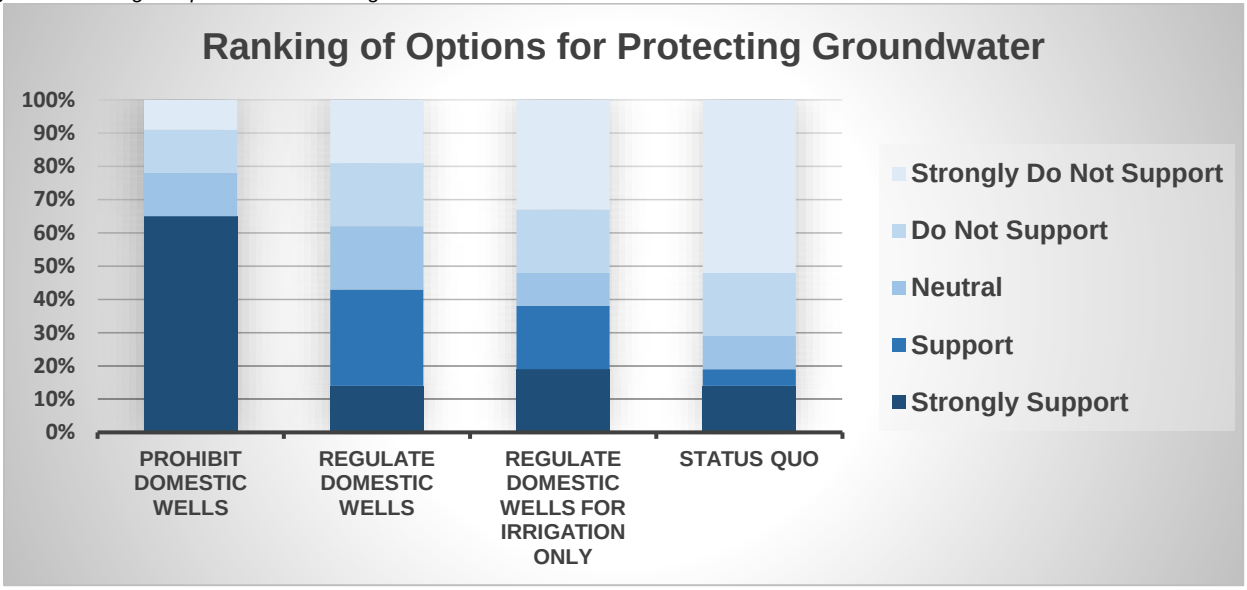
Demographics

A total of 24 individuals participated in the survey with 90% operating in Saskatoon. Similar to the previous stakeholder survey, the largest group of respondents were consultants that design wells for the monitoring or pumping of groundwater (43%) and subject matter experts (38%), followed by City of Saskatoon employees (19%), drillers or well installers (10%), and land developers (5%). Out of the respondents, 48% stated they completed the survey as a representative of a businesses, organizations, or groups.

Proposed Options

Out of the proposed options, prohibiting new domestic-purpose pumping wells received the most support from participants with 65% strongly supporting this option. This option was followed by allowing new domestic purpose pumping wells for irrigation-only, which received an equal amount of support and opposition. Both allowing new domestic-purpose pumping wells for all domestic users and not regulating domestic-purpose pumping wells were not supported overall.

Figure 2: Ranking of Options for Protecting Groundwater



The following themes emerged from the comments that were provided by participants:

Education and knowledge needed: one respondent identified that well-owner knowledge on the safe operation and use of wells poses one of the greatest risks in allowing groundwater use in Saskatoon

Monitoring needed: it was suggested that water wells, their installation, and water withdrawal should be regulated and monitored if domestic-use wells are to be allowed; there should be sound rules to follow or else domestic-use wells should not be allowed

Safety and responsibility: the safety of the public is paramount and allowing the removal of groundwater for household use has consequences; if domestic-use wells are allowed who would be responsible for ensuring the water is safe to use

Using groundwater for irrigation: although one respondent felt that using groundwater for irrigation purposes should be encouraged to reduce the use of City treated water, other respondents identified that water quality from Saskatchewan aquifers is rarely good for irrigation purposes; allowing groundwater use for irrigation would only be advantageous for users that can already afford additional water costs associated with hauling water, hiring a contractor to water their greenspace already, or purchasing more water

> *"There are alternative methods to access water for irrigating gardens or yards including rain barrels or hauled water. The focus should be on supporting conservation decreased demand on non-industrial use of private systems. Allowing domestic wells for irrigation is likely to end up with wells connected to domestic household plumbing which could also present issues for existing centralized municipal supplies."*

> *"Irrigation water need not meet drinking water guidelines so people can invest in alternative ways of collecting water. Allowing private wells for irrigation can still increase risk to public safety and groundwater so if that is the direction chosen then some guidance and required maintenance would be good, though not eliminate the risk completely."*

When asked if their preferred option had changed from the previous stakeholder survey, most individuals stated they were unsure (35%), which was closely followed by those stating their preferred option did not change (30%) and those who did not complete the survey (30%).

Participants were asked to rank the proposed options for well maintenance and decommissioning, which resulted in the following ranking:

Support

1. Create an administrative policy for monitoring wells on City land
2. Create a bylaw with a city-wide standard applicable to all monitoring wells
3. Amend the development standards for large-scale developments
4. Promote voluntary use of the guidelines for wells on private lands

The results were broken down further by specific stakeholder groupings:

Table 4: Average Ranking from 1 to 4 of Specific Stakeholder Groupings for the Proposed Options

Stakeholder Type	Creating an Administrative policy	Promoting voluntary use of the guidelines	Amending development standards	Creating a bylaw with city-wide standard	Total # of Respondents
City of Saskatoon Staff	1.5	3.3	3.0	2.3	4
Consultants	2.1	3.8	2.6	1.6	9
Drillers	2.0	1.0	3.0	4.0	2
Land developers	-	-	1.0	4.0	1
Subject matter Experts	2.3	3.8	2.8	1.3	4
Unsure	1.7	3.0	2.3	3.0	5
Combined Average	**2**	**3.3**	**2.6**	**2.1**	**25**

**Numerical values represent the average value provided by the specific stakeholder group for each proposed option, as well as the combined average (bottom row) and total number of respondents for each stakeholder group (right column). Rankings were on a scale from 1 – 4, with 1 referring to the greatest support.*

Final Thoughts

When asked if the proposed changes described in the survey addressed any concerns stakeholders may have had with the previous options for groundwater protection in Saskatoon, most respondents stated yes (40%), followed by unsure (35%) and somewhat (15%).

The following themes emerged from the final comments provided by participants:

Bylaws and guidance needed: the combination of a bylaw with clear guidance on the decommissioning of wells would be advantageous

Focus on education: focussing on already existing programs that conserve water and practise better water use could decrease overall demand, protect groundwater and public safety, and ensure Saskatoon remains resilient to change by setting realistic expectations on our water use; residents need to learn how to properly manage their private water sources before turning away from their centralized water distribution systems that are already designed to be safe and efficient

> *"I know the City supports programs and education that encourages users to decrease consumption and take alternative methods (e.g., rain barrels, xeriscaping, etc.) but I would encourage them to really work to establish these programs."*

Monitoring and administering: many respondents stressed the need for regular monitoring of groundwater quality and quantity; one respondent asked whether a public registry would be created to document the proper decommissioning and abandonment of groundwater wells as well as current well locations

Resources for the program: a respondent identified that this project can be especially difficult given the lack of resources and where best to spend them; a lack of resources is the reason for why specific well locations/records do not currently exist

Responsibility: one respondent suggested that there is no need for regulation by the City since the Water Security Agency is already the authority for groundwater wells in the province; another respondent suggested that the provincial regulations do not fully cover groundwater protection.

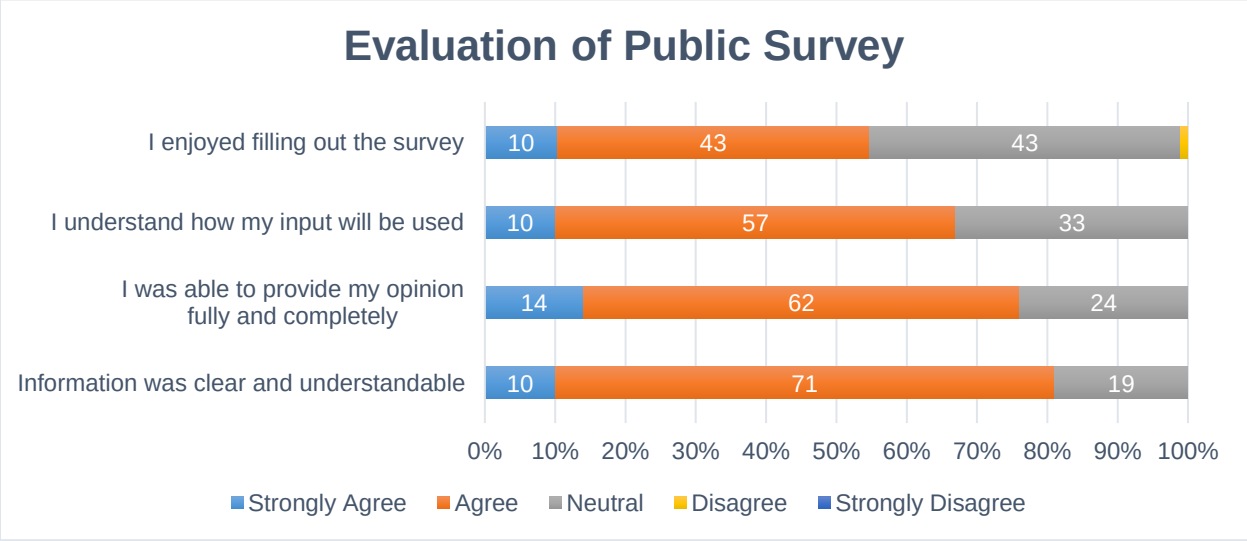
3 Evaluation

Evaluation is discussed in terms of feedback received during engagement activities and through informal comments, data limitations and opportunities for improvement.

3.1 Evaluation

Participant evaluation through the surveys indicated support for both the level of engagement conducted and the opportunities provided. Within the last survey, 81% of participants agreed or strongly agreed with the information that was provided being clear and understandable, with 76% feeling they were able to provide their opinions fully throughout the process.

Figure 3: Evaluation of Stakeholder Survey



Comments provided by participants were supportive of the process:

> *"Looking forward to seeing what you finally decide!"*
>
> *"I believe this is a worthwhile endeavor and commend the City for being proactive. Well done."*
>
> *"The engagement page was really well written. Great job to those involved. This is a very important topic to help protect groundwater quality, integrity, and help ensure responsible parties are held accountable for abandoned wells."*

3.2 Data Limitations

Due to public health orders (i.e., social distancing measures) and considerations related to the COVID-19 pandemic, engagement activities were confined to virtual means. Virtual engagement has limitations, primarily by limiting accessibility for those without internet access or with limited computer literacy and by enabling accessibility by those who have a more active online/social media presence. The COVID-19 pandemic has also shifted the priorities for many people, resulting in numerous stakeholders being unable to participate in our engagement process due to more pressing concerns. Therefore, some residents and stakeholder groups may not have been able to fully participate in the engagement activities conducted; however, the results are considered

to provide the best available indication of how stakeholders perceive the proposed options at the current time.

When developing the engagement strategy, it was decided that well owners would not be engaged, which was primarily due to the lack of active well owner records. The Water Security Agency has a database of water wells drilled within the province; however, it does not include monitoring wells nor all domestic wells. Furthermore, since domestic wells do not require a provincial licence, up-to-date records are not maintained. Locating domestic wells on a door-to-door basis within residential areas was not considered feasible at this time. Also, because the proposed changes to the policy could potentially restrict the activities of those desiring to own domestic-use or monitoring wells, the project team engaged with subject matter experts and associations to gain more general perspectives in shaping the options. Therefore, it was decided by the project team to follow best practice research and focus on engaging with stakeholders directly involved in the construction, maintenance, and decommissioning of groundwater wells.

3.3 Opportunities for Improvement

Based on participant feedback, the following opportunities for improvement will be considered for future engagement activities:

- Engagement strategies and activities that incorporate COVID-19 precautions should be developed to optimize engagement during this period
- Educating the community on the importance of groundwater and the risks associated with its use for domestic purposes should be a priority for education and awareness campaigns
- Discuss with stakeholders prior to launching engagement activities about what is the most optimal time/season to engage them.

4 Next Steps

The next steps for the Options for Groundwater Protection project are described below:

- Options Identification
  - Develop options for groundwater protection in Saskatoon using best practice research and engagement feedback
  - Ask industry and public participants to identify opportunities and barriers for each option
- Close the Loop
  - Validate findings and recommended options with stakeholder groups
  - Determine the level of support for the recommended options and identify any risks.

We Are Here Options Presented to City Council