# WATER SUPPLY ADVISORY COMMITTEE

## Monday, May 16, 2022
## Held Electronically Via Zoom

## AGENDA

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**CALL TO ORDER 3:30 p.m.**

**AGENDA**

**1.** Adoption of Agenda

**PRESENTATIONS AND DELEGATIONS**

**BUSINESS ARISING FROM MINUTES AND UNFINISHED BUSINESS**

**MINUTES**

| | | |
|---|---|---|
| **2.** | Water Supply Advisory Committee Meeting Minutes of March 7, 2022 – *for receipt only* | Annex A pp 1 - 3 |

**REPORTS**

| | | |
|---|---|---|
| **3.** | Reclaimed Water Feasibility Study<br>Vice Chair, WASAC | Annex B pp 4 - 7 |
| **4.** | Water Strategy Update<br>Manager, Strategic Initiatives | Verbal |
| **5.** | Update on Current Water Supply Projects<br>Manager, Strategic Initiatives | Verbal |
| **6.** | WASAC End of Term Debrief Session<br>Manager, Strategic Initiatives | Verbal |

**COMMUNICATIONS**

**NEW BUSINESS**

**NEXT MEETING TBD**

**ADJOURNMENT**

**SUNSHINE COAST REGIONAL DISTRICT**
**WATER SUPPLY ADVISORY COMMITTEE**

**March 7, 2022**

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RECOMMENDATIONS FROM THE WATER SUPPLY ADVISORY COMMITTEE MEETING HELD OVER ZOOM.

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| **PRESENT:** | Chair | S. Thurber |
| | Vice-Chair | D. McCreath |
| | Members | T. Adams |
| | | T. Beck |
| | | B. Fielding |
| | | R. Hanson |
| | | M. Hennessy |
| | | D. Marteinson |
| | | A. Skelley |
| **ALSO PRESENT:** | | |
| (Non-voting) | Director, Area F | M. Hiltz |
| | Director, Area D | A. Tize |
| | Director, Area A | L. Lee |
| | Mayor, Town of Gibsons | B. Beamish |
| | GM, Infrastructure Services | R. Rosenboom |
| | Manager, Strategic Initiatives | M. Edbrooke |
| | Administrative Assistant/Recorder | G. Lawrie |
| | Strategic Planning Coordinator | A. Wittman |
| | Public | 1 |
| **REGRETS:** | Members | K. Chi |
| | | T. Silvey |

*Directors, staff, and other attendees present for the meeting participated by means of electronic or other communication facilities in accordance with Sunshine Coast Regional District Board Procedures Bylaw 717.*

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**CALL TO ORDER** 3:36 p.m.

**AGENDA** The agenda was adopted as presented.

**REPORTS**

*The Strategic Planning Coordinator provided the Committee with a presentation on the draft SCRD Water Strategy Engagement Plan.*

Discussion on the draft SCRD Water Strategy Engagement Plan included the following:

  - SCRD should seek input on guiding principles from community, so the public can guide the Water Strategy in the long-term
  - Important to have a feedback survey available at all open houses and public engagements
  - Agree on a 'One Water, One Region' approach; staff agreed, one guiding principle has been included called 'Think and Act Like a Region' to promote a consistent approach across all SCRD managed water systems

- Key target audiences to recommend:
  - Suggestion to include the Sunshine Coast Conservation Association on the project stakeholder list
  - Suggestion to include various community associations across the region, First Nations, industrial sectors, heavy water users, breweries, and farms on the project stakeholder list

- Should the engagement plan include a second WASAC workshop or would the Committee prefer to engage in roundtable discussions within their community?
  - Suggested survey before the end of term in May

*The Manager of Strategic Initiatives provided the Committee with a presentation on the 2022 Water Rate Structure Review Process.*

Discussion included the following:

- Concern about "too much public involvement"
- An identification of stakeholder groups to start could be useful
- Estimated date for any changes to the current rate structure review: not before January 1st, 2024
- Pricing for different types of uses (i.e. industry/agriculture)
- Conservation rate structures could include progressive rates or higher volume usage rates
- Suggestion that if a Water Strategy guiding principle is fair it would be unnecessary to consult public regarding rate structure and the rate should be based on operating costs to make system viable
- Discussion about UBC Metrics report comparing water utility rate structures
- Suggestion that the more you use, the more you pay, and conservation will result

*The General Manager, Infrastructure Services provided the Committee with an update on current water supply projects.*

Discussion included the following:

- Church Road Well Field Development Project started March 7 2022:
  - Currently clearing brush/trees
  - Intent for project to be ready in September 2022, timeline will be dependant on delivery time for some materials
  - New pipes will be laid down the middle and the side of the road

- Environmental Flow Needs (EFN) proposal:
  - Currently with BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development for review

- Phase 2 of Exploratory Groundwater Investigation at Potential Reservoir Site:
  - Permit for geotechnical drilling will be completed by September 2022
  - The drilling will enable the SCRD to confirm the feasibility of developing a reservoir at the site

- District of Sechelt Reclaimed Water Feasibility Study:
  - Final report is due back by the next WASAC meeting in May
  - Currently at 80%
  - Will go to District of Sechelt Council first and then the SCRD Infrastructure Services Committee agenda or at minimum to WASAC

- Gas vs. Chlorine Upgrade to Chapman Water Treatment Plant:
  - The urgency for the 2.2-million-dollar project was that the system was not functioning from a safety perspective due to proximity to the community and location at the top of the hill with road access
  - Gas used less and less in industry due to safety

**NEW BUSINESS**

- Vice-Chair McCreath asked that WASAC have a standing agenda item regarding long-term source protection to discuss watershed protection. This topic would generally align with the Advisory Planning Commission. Staff can consider how this topic would fit under the Committee's Terms of Reference.
- The 2-year appointment for WASAC members ends in June 2022, a call for applications will be posted Spring 2022. Current WASAC members can reapply. It will be put out to public for about 6 weeks and then forwarded to the SCRD Board for their consideration.

**NEXT MEETING** May 9, 2022 @ 3:30 p.m.

**ADJOURNMENT** 5:23 p.m.

ANNEX B

**To:** Water Supply Advisory Cmte., SCRD. April, 2022

**From:** Dougal McCreath, Vice-Chair, WASAC.

**Re:** Potential use of reclaimed water from District of Sechelt Water Resource Centre (WRC).

At our WASAC meeting of Nov.8/21 we discussed the potential option of using reclaimed water from the District of Sechelt (DoS) to help meet the Environmental Flow Needs (EFN) in lower Chapman Creek, resulting in a Recommendation - - - *that staff evaluate the benefits to the SCRD water supply system*- - - of this option. Our Recommendation was formally approved by the Infrastructure Services Cmte on Nov.18/21, with amendments that (a) costs should also be considered, but that (b) there was no specific timeline for this study to be done.

Since then, a consultant's study (90% complete) of various potential uses of the DoS reclaimed water has been presented to the DoS Council (March 9/22). This study indicated that the cost to pump the reclaimed water to a discharge point into Chapman Creek just below the Water Treatment Plant intake weir would be approximately $10.8M. Some Council members noted that this cost might be significantly offset by eliminating the need to construct a new ocean effluent outfall (~ $4M) and by accessing infrastructure grant funds (to cover perhaps up to 73% of the capital cost). Still, as this project would have a substantial cost this does beg the question of whether the potential benefits to the SCRD water supply system could justify such a cost. **WASAC urges the SCRD to proceed with our previous recommendation (as amended) to undertake detailed analysis of this option so that it can be compared to other alternatives, such as a new raw water reservoir, additional groundwater wells or external water sources.**

In order to get a preliminary feel for the potential benefits of using reclaimed water from the Sechelt WRC, I undertook an analysis of this question based on publicly available information regarding water supply and demand projections during a drought year, specifically with respect to meeting the Environmental Flow Needs (EFN) in lower Chapman Creek. Note that there are two important points to keep in mind regarding EFN requirements.

1. Chlorinated well water cannot be added directly to the Creek to meet EFN.
2. The only waters that are available to meet EFN are (a) the natural water in the creek coming from the watershed, and (b) raw water from storage, which currently comprises only Chapman and Edwards lakes

The most recent data and projections for the Chapman water system supply and demand volumes under "drought year" conditions are contained in the comprehensive report by Integrated Sustainability titled *Water Demand Analysis* which was presented to the SCRD Planning and Community Development Cmte. on Dec.13, 2018. The conclusions summarized below are based on analysis of the data in that report (a summary of this analysis is provided following the conclusions).

- The report defined a "design drought scenario" of Stage 2 restrictions from 1 May to 31 Oct, a total of 184 days. During this time, the natural watershed flow cannot supply both potable water and EFN, and cannot even supply the EFN alone for July to October. The amount of water that must be supplied from Chapman and Edwards lakes solely to

maintain EFN flows would be 878,290$m^3$, which is roughly equal to the entire storage capacity of either Chapman Lake (831,000$m^3$) or Edwards Lake (810,000$m^3$). In other words, **under the current design drought conditions the entire water volume in Chapman Lake must be reserved solely to meet EFN requirements and is not available to contribute to SCRD drinking water supply.**

- However, if DoS reclaimed water (current volume of 2,200$m^3$/day) were used to contribute to the EFN requirements, this would free up 405,000$m^3$ of water from the Chapman Lake storage, making it available to the SCRD drinking water supply system. In other words, **under current conditions the contribution of the reclaim water would be equivalent to building a new surface storage reservoir equal to about half the volume of Chapman Lake.**

- It is interesting to note that reclaimed water increases with time as population increases, whereas the availability from any new surface water source is expected to decrease with time, as has been the case with Chapman Creek itself. The volume of DoS reclaimed water will increase in the future as DoS population grows, with the current capacity of the WRC being 4,000$m^3$/day. This flow volume would provide 736,000$m^3$ for EFN, meeting 84% of the EFN deficit and requiring only an additional 142,000$m^3$ from Chapman/Edwards lakes. **Under future conditions utilizing the current capacity of the WRC, the contribution of the reclaimed water would be equivalent to building a new surface storage reservoir equal to almost 90% of the storage volume of Chapman Lake.** For a projected total project cost of $10.8M this would equate to less than $15/$m^3$ for an additional 736,000$m^3$ of storage.

Clearly, the use of reclaimed water to help meet EFN requirements could make a very major contribution to the SCRD water supply system, by allowing utilization of almost all the volume of Chapman or Edwards lakes for supplying potable water needs. However, whether reclaimed water turns out to be the most (or least) cost-effective option depends on the cost/benefit of the alternative options, such as the raw water reservoir, additional groundwater wells or external surface water sources. These three options are slated for further study by the SCRD in 2022-23, and the option of using reclaimed water requires the same level of study to enable comparison. By way of example and based on current estimates, approximate comparative costs/$m^3$ of three alternatives are indicated below.

- **Reclaimed water**: cost of $10.8M for future equivalent storage of 736,000$m^3$ = **$14.67/m^3**
- **Raw water reservoir**: cost of $54M for 1.3M $m^3$ of storage = **$41.50/m^3**
- **Wellfield** (Church Rd): cost of $9M for 1.01M$m^3$ of replaced storage = **$9/m^3** (assuming the wellfield is pumped at maximum capacity of 5,500 $m^3$/day throughout the 184 day drought period). Note: well water that has been chlorinated cannot be used directly to meet EFN requirements.

Attached is a summary of the analysis which underlies the conclusions noted above.

Assumptions

- Environmental Flow Needs (EFN) requirements for Lower Chapman Creek i.e. below the WTP diversion weir, are 200L/sec which is 17,280$m^3$/day.
- The modeled "design drought" comprises 184 days of Stage 2 restrictions (May 1 – Oct.31).
- During Stage 2 restrictions, the natural watershed flow (i.e. the Watershed Supply, WS) is not enough to supply both potable demand and EFN.
- Whereas well water can be used to help make up the potable water demand, EFN requirements cannot be made up directly by well water, as this has been chlorinated and cannot be discharged directly into Chapman Creek.
- Consequently, once the watershed supply (WS) becomes less than the combined EFN and potable demand, water must be released from the Chapman/Edwards lakes storage system to make up the deficit.
- During the months of July-October, the WS cannot even supply the EFN alone, so even if the potable demand was zero, the EFN deficit must still be made up from storage.
- Current flow of reclaimed water from the Sechelt Water Resource Centre (WRC) is 2,200$m^3$/day
- Current capacity of the WRC is 4,000$m^3$/day.
- The WRC has been designed to accommodate a far future expansion to 8,000$m^3$/day.

Analysis

Based on the Water Demand Analysis by Integrated Sustainability the amounts of water that would have to be released per month from Chapman Lake storage to make up the EFN alone, can be calculated from the data in Table O (p.251 of the SCRD agenda package, Dec.2018) as follows:

(EFN minus WS) x (# days/month) = water required from Chapman-Edwards Lake storage/month.

For the months of May and June, the Watershed Supply is greater than the EFN, so no water would be needed from Chapman Lake storage to make up the EFN. However, some storage water is still needed to make up potable demand.

So, storage water required to make up the EFN in the Design Drought Year would be:

May & June: = 0

July: (17,280$m^3$/day – 15,880$m^3$/day) x (31 days) = 43,400$m^3$

Aug: (17,280$m^3$/day – 8,990$m^3$/day) x (31 days) = 256,990$m^3$

Sept: (17,280$m^3$/day – 6,180$m^3$/day) x (30 days) = 333,000$m^3$

Oct: (17,280$m^3$/day – 9,380$m^3$/day) x (31 days) = 244,900$m^3$

**Total water required for EFN from Chapman Lk storage = 878,290$m^3$**

Note that the total volume of Chapman Lake is 831,000$m^3$.

If reclaimed water from the Sechelt WRC could be used to help meet the EFN this would free an equivalent amount of Chapman Lk storage water, making it available to meet potable water requirements. Over the 184 days of Stage 2 restrictions this would equate to approximately:

Current condition: (2,200$m^3$/day of reclaimed water) x 184 days = 404,800$m^3$ of water

Future condition: (4,000$m^3$/day of reclaimed water) x 184 days = 736,000$m^3$ of water

Far future condition: (8,000$m^3$/day of reclaimed water) x 184 days = 1.47M$m^3$ of water

Under conditions of climate change, water supply sources for the Sunshine Coast are generally predicted to decline in volume. However, providing reclaimed water to Chapman Creek has the unusual and highly desirable characteristic as a supply source of increasing in volume with time. This means that its value in a cost/benefit analysis should be calculated based on the time series of flow, not just the initial flow.

The "Current conditions" scenario (2,200$m^3$/day), satisfies 46% of the EFN deficit, equivalent to 49% of the volume of Chapman Lake. The "Future condition" (4,000$m^3$/day) satisfies 84% of the EFN deficit, equivalent to 89% of Chapman Lake or 45% of the current combined storage of Chapman and Edwards lakes. The WRC has been designed to accommodate an expansion to twice its current capacity, so the "Far future condition" (8,000$m^3$/day) would satisfy 90% of the combined storage of Chapman and Edwards lakes, 113% of the proposed raw water reservoir and 145% of the annual production of the Church Rd wellfield (assuming it is pumped continuously at maximum capacity of 5,500$m^3$/day for 184 days).

Full analysis of the costs and benefits of using reclaimed water from the WRC to meet EFN requirements must of course include assessment of the environmental impact on the Chapman Creek ecosystem, as noted under the "BC Reclaimed Water Guideline". Issues of temperature, nutrients, contaminants, etc. are valid considerations to be addressed. In this regard I would note that potential mitigating measures must also be considered, such as the effects of dilution of the reclaimed water when added to the creek water - never less than a ratio of 7:1 – and the possible use of the pipeline from the WRC to the Creek as a cooling circuit.

Conclusion

**The potential benefits to the SCRD water supply system of using the reclaimed water from the District of Sechelt Water Resource Centre to help meet EFN requirements in Chapman Creek are substantial, and fully justify the recommendation that SCRD proceed expeditiously with a detailed study of the costs and benefits of this option.**