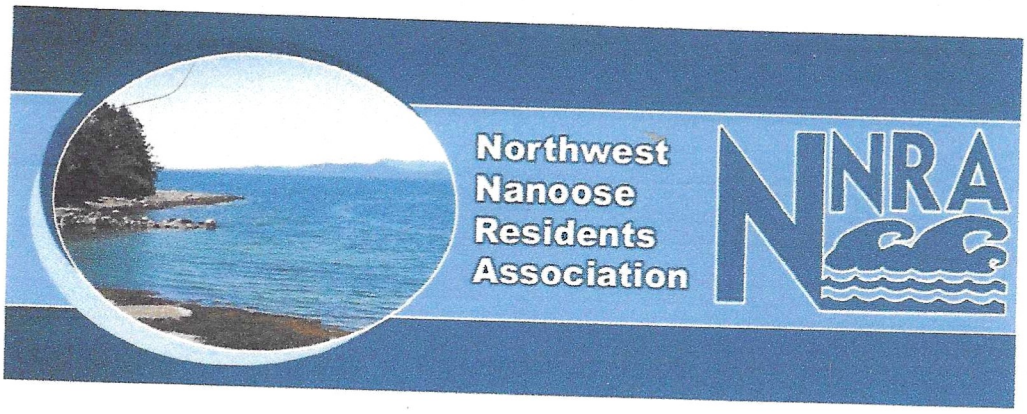

Email: 03/23/24

Continued Discussions of Water

Bob Rogers, Director Area "E":

You're likely a busy man this time of year with the budget process or we somehow missed your reply to the below invite. In any event, NNRA wishes to continue discussions on water and increase our level of understanding around this important commodity of life.

Please recall as a result of the public forum you hosted last year and follow up discussions, we were assured that contrary to RDN's discretionary Stage 4 alarm, there in fact was plenty of water in our summer time storage wells/aquifers. Not only was last summer's supply plentiful, we came away with a clearer understanding of adequate water existing over all seasons to service existing residents, as well as future development. The reason Nanoose went to Stage 4 restrictions is that the Province declared a drought level that recommends going to the most severe water restrictions due to the lack of water in the rivers, impacting fish. We now better understand the design and seasonal intent of "turning on" our storage wells/aquifers when the Englishman River is low. This design and intent knowledge should have alleviated the RDN's discretionary call to go to Stage 4 restrictions, but it did not. Yes, the Province has the authority to order maximum restrictions, but they simply did not, last summer.

So, in anticipation of another likely dry summer, we would like to talk about these important storage wells/aquifers. Can you please provide or direct staff to provide answers to the following questions:

Aquifers:

1. How are the aquifers accessed by the RDN monitored?- i.e. monitoring existing wells, separate observation wells?
2. How many aquifer monitoring sites are in Area "E"?
3. What was the average drawdown of the aquafers during 2018 to 2022, depth and volume?
4. What was the maximum drawdown of the aquifers in 2023, depth and volume?
5. What is considered a critical drawdown level for RDN Aquifers?
6. On average, when are aquifers considered fully recharged after a summer drawdown?
7. What is the current status of aquifer recharge after 2023 summer?

Thank you in advance, for taking the time to address these questions submitted on behalf of NNRA. Our next Board meeting is April 2, 2024. Anything provided by then would be appreciated or shortly thereafter.

Neil A. Watson,
Secretary, NNRA

Home Office,
Nanoose Bay, B.C.

RDN Responses Attached

Summary of Meeting April 3, 2024

11am
Rudi & Neil meeting with Bob Rogers and Murray Walters, Manager of Water Services re water restrictions

The following was learned from & vetted by Murray Walters:

- Province has Drought **Levels**, 1 – 5. The Level is determined by the amount of snow pack and 'surface' water in the rivers
- The RDN has Outdoor Water Use Restrictions **Stages**, 1 – 4. The Stage is primarily determined by RDN staff based on their monitoring of water levels of local aquifers and wells. In times of drought there are also recommendation from the Province that affect the local decision. In the case of Nanoose in 2023, the water license for the Arrowsmith Dam stipulated what Stage both RDN Nanoose and City of Parksville were required to be at.
- "On Stream" wells: There are 4 wells in the Fire Hall area that are used, one on Mosaic lands above Springford Farm and one by Stone Lake Rd. In the winter they operate roughly 6-7 hours per day and in the summer they are operating 20 – 24 hours per day;
- There are additional "off stream" wells that are not used due to high iron and manganese;
- The wells used are monitored 24/7 and can be operated remotely;
- They have a number of other wells that are just used for monitoring, some are also monitored by the Province. This is for monitoring the aquifers;
- Water usage in the summer, at Stage 2 is 2-3x more than in the winter;
- When the Arrowsmith Dam was constructed by the Arrowsmith Water Service (AWS) joint venture it was calculated that it would be able to handle the potential build out of Nanoose (Fairwinds basically) and Parksville until 2050.. Development and/or population increase is lower or slower than what was predicted. Note that the partners in the AWS are RDN Area E 14.4%, RDN Area G (French Creek) 8.0%, Town of Qualicum Beach 13.7%, and City of Parksville 63.9%

- From completion of Arrowsmith Dam, the Englishman River Water Service ("ERWS") joint venture was derived to allow the river water to be used as drinking water on a year-round basis. Essentially a cost sharing joint venture between Area "E" and the City of Parksville based on forecast future water need , with Area E owning 26% via the Nanoose Bulk Water Service Area & Parksville Owning 76%,.

- The pump station by Craig Bay Estates is functional all year round and pumps water from the Englishman River Water Service Treatment Plant, via the Top Bridge Reservoir,to the reservoirs on Notch Hill near Fairwinds golf course. In the summer time the Madrona area is supplemented with water from this system;

- During the watering season the wells are working flat out and the remaining demand is met from the ERWS. A minimum flow in the river for fish must be maintained, as set out in the Operating Rule for the Arrowsmith Dam. ;
- The operational agreement for the dam with the Province is what 'dictates' the amount of water that is released from the dam. The minimum release is set according to meeting the minimum flow for fish as measured by the flow gauge at the Orange Bridge. ERWS water withdrawal from the river occurs upstream of the flow gauge.
- Supplying the minimum flow for fish in the last couple of years has been difficult due to drought conditions. More storage capacity (ie more dams) would help with this. This has been long talked about but a very expensive proposition. Claudet Rd. well is about to be used for tested as a possible site for additional underground storage with final conclusions not expected until 2025;
- The additional "off stream" wells that are in place are not sufficient to be able to reduce outdoor water use restrictions in the summer, and they would be very expensive to have the required filtering of iron/manganese in order to be brought "on stream" ;
- Throughout the droughts of the last two summers. there has never been any concern about having enough drinking water nor water needed for

safety/fire and the plans in place indicate this should be the case until 2050 as long as we continue to follow the planned development of the ERWS assets.. Those plans were made with the science of the day with respect to climate change. Plans made today would likely look a bit different, particularly in the 2040-2050 era as our understanding of climate change has increased greatly;

- The local aquifers recharge typically once the summer season of heavy water usage season. Our well levels have typically recovered by late November;
- Climate Change is having an impact on snow levels and rain. Much less snow and more intense rain events will become the norm. Without the snow levels, there is no "extra storage" of water as snow above the dam. It is not possible to increase the height of this dam which would give ergo greater capacity. Murray's gut feel is that we'll need another dam in the long term to effectively deal with climate change.
- There is a proposal in the works, expected to be finalized by end of April, for redefining some of the watering stages. A <u>proposed</u> change of stage 4 will now allow us to responsibly wash cars and boats, etc;
- Excessive garden & lawn watering is at the root of water shortage and is the goal of RDN's implementation of various Watering Stages – potable drinking water is expensive to produce;