Fire & Water: Concerns, Solutions, Issues

Community Meeting
7.30 pm Oct 4, 2024 Square Butte Hall

West Foothills Water Coalition website: wsdl.ca/wfw

Announcement

The Foothills County prohibits the smoking, vaping or consumption of any cannabis product in any public place within Foothills County.

A public place is defined as any place including privately or publicly owned or leased property, which the public reasonably has or is permitted to have access, whether on payment or otherwise.

The Square Butte Community Hall is considered a public place and is bound by this local bylaw.

Introductions

West Foothills Water Coalition (WFWC):

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Our Plan for Today

Concern: Forest Fire Threat

Concern: Improper use of Water Treatment Plant and Bulk Fill

Concern: Dropping Water Table & Drying Wells

Solution 1: Do Nothing

Solution 2: Use Water Treatment Plant only as a bulk fill station

Solution 3: Revisit Possibility of a Water Pipeline

Your Concerns, Solutions, Views, Questions and Discussion

Main Objective: Develop a cohesive plan with which we can go, as a community, to the County of Foothills. Hopefully this meeting is a start.

Concern: Forest Fire Threat; 2018 Fire

"Alberta Wildfire is currently on the scene of an "out of control" wildfire near Bragg Creek that started early Sunday. Crews said on Monday the fire didn't grow overnight, but it was still classified as out of control."

"As of 1:15 p.m. Monday, a voluntary evacuation was in place for areas west of Highway 762, between Highway 22 and 178 Avenue West in the Foothills County of Foothills."

Source:

Alberta firefighters battling 'out of control' wildfire near Bragg Creek

By Christa Dao Global News, Posted Sunday May 27, 2018 3:14 pm, Updated May 28, 2018 9:06 pm

However, our Firefighter Heroes saved the day!

Concern: Forest Fire Threat; Some Issues

- 2022 brushfire is a reminder that we need to be vigilant.
- Local fire facilities (Burby Fire Hall) closed circa 1990 due to lack of water
- Increasing temps; decreasing precip. since 2000 in this area
- HW 762 corridor is in frontline of Kananaskis wildfire threat
- Residential cisterns are not viable for firefighting in most cases
- 'Arrangement' with Kananaskis for heli-assist
- No dedicated fire plan using treatment plant as supply

- About 200 homes in the area essentially unprotected from high wildfire threat
- No local fire response initiatives (muster points, call out schemes, communications, voluntary fire parties)
- Heli-assist may not always available in a major fire
- Insurers have already or will recognise increased geographic risk
- We are already disproportionally penalised for insurance due to fire station distance.

Concern: Improper use of Bulk Fill Station

- In recent years, neighbours have noticed on some days there is no water available from the West Foothills Bulk Fill Station. And neighbours have also observed commercial water trucks, from outside the Foothills County, at the Water Treatment Plant using the Bulk Fill Station.
- At present, the Treatment Plant is licenced for 91 acre feet (equivalent to 273 homes, assuming 3 homes per acre foot) but that water, as per the licence conditions, should only be used within the designated service area. Physical capacity can be increased if more water licences are added to the facility.
- The design capacity of the reservoir (205 acre feet = 615 homes) is sufficient to supply the originally proposed regional pipeline (c.f. 2018 MPE report). Additional water licence capacity of about 114 acre feet would be needed to be applied to the Water Treatment Plant to allow this. Water licences are available within the Fish Creek watershed which could be applied by the County to the Water Treatment Plant with Alberta Environment approval.
- It is very important that the community has discussions with Foothills County to retain all the current water licence capacity at this facility. If licences are moved, we have been told there might be capacity at the Water Treatment Plant bulk fill station for only 45 homes.

Concern: Improper use of Water Treatment Plant and Bulk Fill Station; Issues

Designed

- Reservoir capacity: 205 acre feet, adequate for 615 homes at 3 homes/acre ft (Alberta Environment, re, 3 homes/acre foot)
- Licenced capacity: 91 acre feet (273 homes)
- At present water treatment can process
 12 cubic meters per hour, ie, 50 gallons per
 minute, into the two storage tanks.
 Additional treatment pumping capacity can
 be added, at relatively low cost, as needed,
 with appropriate engineering and licencing
- Designed for residential water supply and firefighting only
- Water to be used in licenced point of use area only. Commercial tanker truck use of the Water Treatment Plant in non-compliant

Originally designed as a treatment plant to service regional and local water needs with a pipeline, including fire suppression.

Current

- Our bulk fill is one of three commercial bulk fill stations in Foothills County but no tank upgrades (at present, two storage tanks, 75.7 m³ tank and 37.8 m³ tank). It is unclear how the commercial designation was given.
- cf proposed Bragg Creek plant; community voted down a commercial filling station
- Our fill station is often depleted for residents due to over use by commercial tanker trucks
- Hwy safety compromised by large tanker trucks on 762 turnoff/on
- Depletion by trucks compromises firefighting water availability
- Water taken outside service area
- Pipeline not built.

Concern: Dropping Water Table & Drying Wells

- In the last 5 years, several residential wells have gone dry.
- Average lifetime of local wells is 30-50yrs (ie wells drilled 1970-1990); well treatment safe and effective in midlife of well only; current drilling costs \$60-75/ft or for a 160 foot well, \$10-12k (data from local drilling company). This estimate may be on the low side. Also, it is not uncommon to drill several dry wells, at considerable expense before a good well is found. Success rates of wells in our area is low and probably decreasing due to global warming.
- Residents have installed cisterns (typically 500 gallons to 3000 gallons), and fortunately can use Water Treatment Plant bulk fill facility to transport water to their cisterns.
- As wells dry up, and commercial use increases, could there be water supply bottle-necks at the fill station in future?

Concern: Dropping Water Table & Drying Wells; Some Issues

- Deep groundwater wells had low original productivity due to low porosity & permeability lithologies
- Some wells have higher production due to natural fracturing
- Decreasing productivity through time due to cementation (can be treated). Most wells +/- 50 yrs old
- Decreasing productivity due to decreasing precip. since 2000
- Increasing consumption: expectation of residents; higher temps and lower precipitation
- Cost to drill new well: \$10-12k
 completed for 160 ft well plus
 \$1500 mobilisation and testing

- Increasing use of cisterns and of the fill station by community
- A residential water pipeline has never progressed despite residential interest
- Two options: large line all the way to Priddis via Rusticana; or smaller line to north and south of Water Treatment Plant
- Either of the pipelines would address future residential water supply and fire suppression issues for the Hwy 762 community and eastward to Priddis.

Possible Solutions

- Solution 1: Do Nothing
- Solution 2: Use the Water Treatment Plant only as a Bulk Fill Station and Retain Current Licences
- Solution 3: Revisit Possibility of a Water Pipeline
- Other Solutions. Let's be creative.

Solution 1: Do Nothing

- Pro: The immediate cost is zero. No effort for anyone. As wells dry up, people can switch over to using the Water Treatment Plant for bulk fill.
- Con: Once we lose the current water licences, unlikely we would ever get them back, with the present system of water allocation, FITFIR (First in Time First in Right; used in Alberta since 1894). Home values will go down as water wells dry up. Most important: If a forest fire develops, and winds are strong, next time, the heli-assist arrangement may not be enough to prevent the fire from reaching HW 762 area and spreading eastward.

Solution 2: Use Water Treatment only as a Bulk Fill Station and Retain Current Licences

- Pro: Low cost solution, however we would need to keep our water licences, with 91 acre foot total.
 Assuming 3 homes per acre foot, that would mean 273 homes would have enough water from the Bulk Fill Station, even if everyone's well were to dry up (which is very unlikely, at least for the next 10 years).
- Con: As water table drops, if licences are moved to another location, we may end up being left with licence capacity for only 45 homes. And fire suppression issues are not addressed.

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Solution 3: Revisit Possibility of Water Pipeline

- Pro: Water is much higher quality than well water; eligibility for 60-70% Alberta Government grant; cost could be amortized over a 10 or 20 year period; our worry about wells drying up is relieved; fire suppression issues addressed; lower insurance costs; residential bulk fill remains for those not hooked up to the pipeline; no more commercial trucks at bulk fill site; and home values go up.
- Con: Needs additional water licences (which are potentially available) if pipeline goes all the way to Priddis. Cost to build the pipeline. Possible administrative fee (may be as high as \$10k per home). Will need community backing, of everyone, from HW 762 corridor and HW 22 and Priddis.

Pipeline Options for the Water Treatment Plant

Option 1: Hwy 762, 22 & Priddis

- Original plan for the proposed 2018 pipeline (MPE study) very high.
- 2018 cost estimate: \$45k per home later revised to \$62k, without gov't grant. Owner pays for connection to cistern. \$10k/home admin fee. Some residents did not view the project favourably.
- Mid-2024 estimates have been generated by a different company: \$23k/home, including fire hydrants. This is a drip feed system; needs cistern for each home. If within 200m of pipe connection to cistern is included in \$23k/home. This figure assumes a 60-70% Alberta Government subsidy. Possible admin. fee as high as \$10k/home, not included, for engineering upgrade and operation of water treatment plant; \$10k is disproportionately excessive
- Why lower? Improved horizontal drilling technology. And the pipeline would supply a community (Priddis), thus the 60-70% gov't fiscal support.

Option 2: Hwy 762 Corridor

- Water would be piped north and south of Water Treatment Plant
- This is also a drip feed system
- Mid-2024 Estimated cost: \$43k/home, including fire hydrants and connection to cistern. The admin fee (up to \$10k/home) not included in this figure of \$43k/home
- Higher cost due to Alberta Gov't subsidy not being included. Hwy 762 community likely is not classified as a hamlet, village or rural subdivision. However, we should not rule out one of the existing subsidy programs, and other financial support may??? be available from the Alberta Government.
- Question of Government subsidy.

Community Involvement

- Enhance communication within the community
 - Website
 - Meetings
- Need more people on the West Foothills Water Coalition committee
- Skillsets needed for the committee:
 - Enthusiasm
 - Youth
 - Possible expertise, formal or practical, welcomed
 - Members from HW 762 corridor
 - Members from North and South of HW 22
 - Members from Priddis

Thank You!!!

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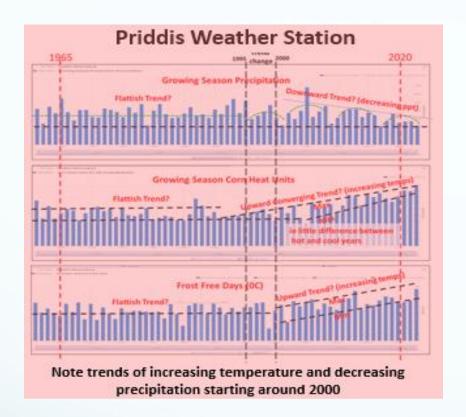
West Foothills Water Coalition website:

wsdl.ca/wfw

Addendum

The following slides, provide maps and further information. We can project maps on the screen during the presentation and during the Q&A discussion session at the end of the presentation. 11"x17" hard copies of maps will be available at the meeting.

West Foothills Water Coalition – Current and Future Work

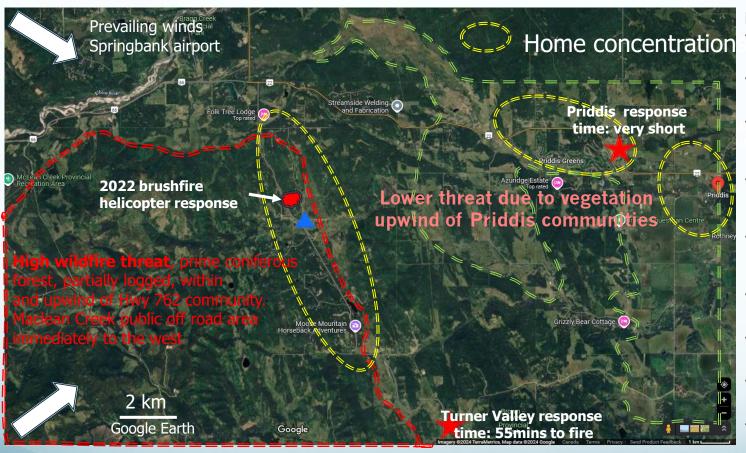


A study is being undertaken by the West Foothills Water Coalition which will review the following:

- Update the surface water licence allocations
- Analyse the historical water production records of currently held Licences. This data has been requested from Alberta Environment
- Determine the trends in precipitation reduction and temperature increases through evaluation of Alberta Environment historical weather data which is available online (see Priddis example to left)

The intent is to integrate the above with the derived water balance of the watershed utilising precipitation and evapotranspiration models. This will give an overall indication of the health of the watershed and the creeks there-in.

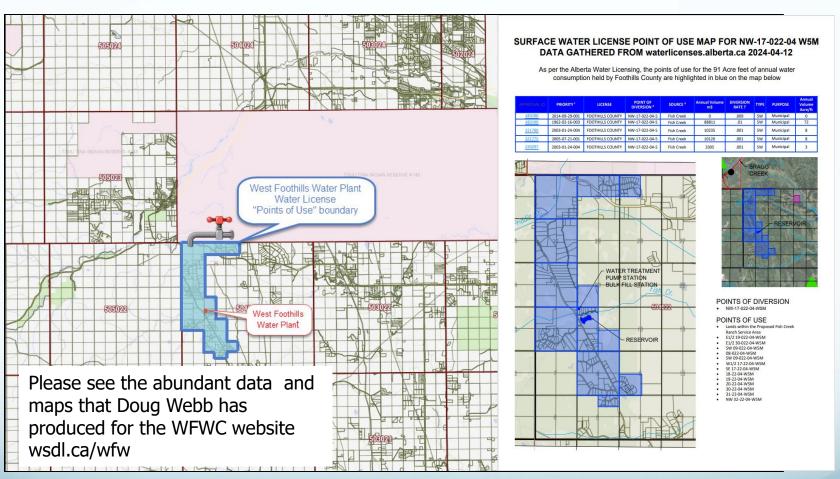
Wild fire Threat Issues — Hwy 762 Community and Priddis



Fire Issues

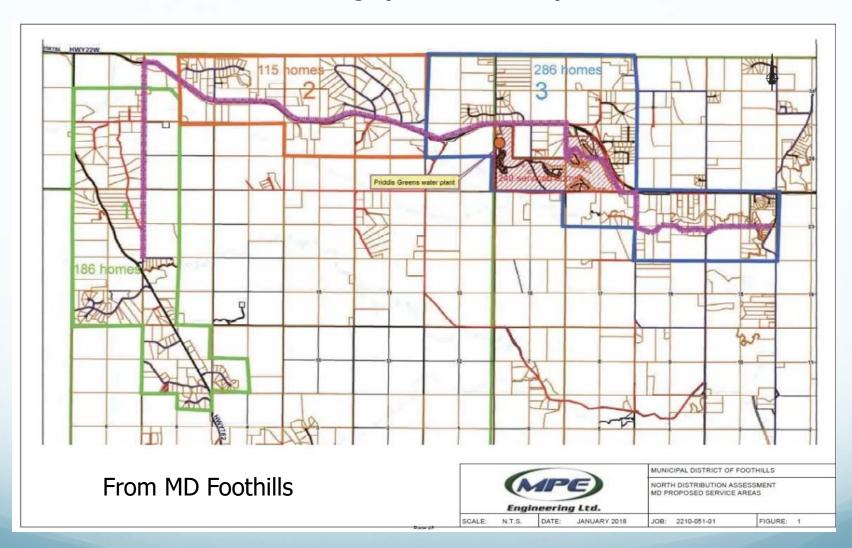
- Very high wildfire threat from Kananaskis in Hwy 762 area.
- Yet no local fire response initiatives (muster points, call outs, notifications, etc)
- Local voluntary fire assoc. disbanded by MD in 1990 due to lack of water (not lack of interest!)
- Reduction in access for fire trucks at fill station (the new fence beside water treatment plant)
- Depletion of dedicated 'fire water' reservoir by commercial bulk water carriers
- Dependency on Kananaskis (what is helicopter availability in fire event?)
- Turner Valley fire station is a long distance away from West Foothills.
- Priddis area fully covered by modern fire station with very low response time
- Can Foothills help our area by facilitating local training, supply equipment, and better water availability?

West Foothills (aka Fish Creek) Water Treatment Plant Water Licence Point of Use Area and Licence Details



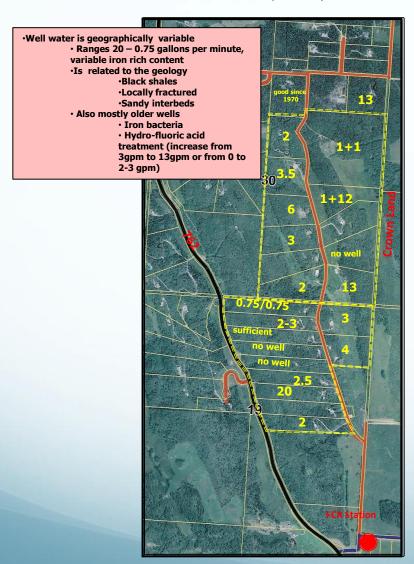
Note top right hand side table indicating total of 91 acre feet of water licences

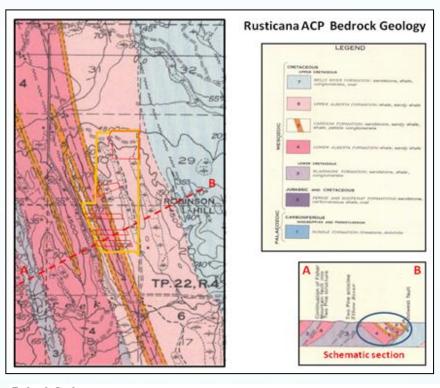
Map from MPE Engineering originally presented to the community in Zoom meeting by Foothills County in 2018



Geology and example well productivities (2010)

Rusticana Estate Water well productivity



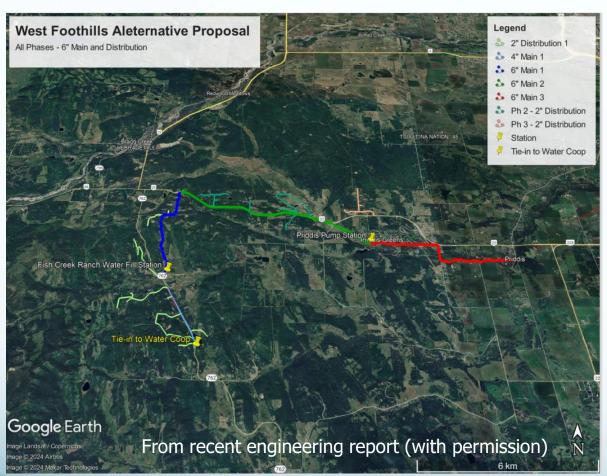


Bedrock Geology

As can be seen in geological map Figure 4, the entire Rusticana area is underlain by rocks of the Upper Cretaceous Alberta Group, which comprise, from bottom to top, the Blackstone (or Lower Alberta) Formation, Cardium Formation and Wapiabi (or Upper Alberta) Formation. The Wapiabi Formation, the formation of interest here comprises an approximately 500m thick section of thick marine shales and siltstones with a few sandstone and limestone members. Subsequent to deposition, during the Tertiary tectonism associated with the creation of the Rocky Mountains, the rocks were folded and faulted with the bed-dips in the Rusticana area of 50-70 down towards the ENE.

The geological map was made in 1942 and reflects the then current road system. It clearly shows the geological structure which comprises a tightly folded NNW-SSE trending anticline with outcropping and more resistant Cardium sands forming the crest of the most westerly of the ridges in Rusticana. Further to the east, underlying the majority of the ACP area, steeply dipping Wapiabi is present and it is the thin resistant sandstone beds within this formation which probably form the more easterly of the ridges. Given that sandstones provide the highest potential water reservoirs, the subsurface distribution of these sand units has an impact on well water supply.

Recent (mid-2024) Scoping Engineering Study - Option 1



Option 1 – Pipeline to Priddis

Pros

- Potentially the least expensive for Hwy
 762 community ballpark \$23k per home
- Is the most beneficial for the watershed by obviating the over exploitation of Priddis Creek
- Is the most efficient for water distribution
- Satisfies Priddis community needs for additional water.
- Would qualify for 60-70% subsidy from Alberta Government
- Fully utilises the high quality 205 acre foot reservoir having blue clay lining
- The existing reservoir can be enlarged if ever needed, as Priddis grows in future
- Provides largest wildfire suppression coverage area

Cons

- Requires additional water licence capacity (from 91 to 205 acre feet) for pipeline to service residences all the way to Priddis
- Needs County to acquire or move licences
- Needs Alberta Environment approval to transfer water licences to the reservoir
- Needs confirmation that Alberta Government support would be forthcoming

Note that all the cons noted above have been addressed in the past with positive outcomes.

Recent (mid-2024) Scoping Engineering Study - Option 2



Option 2 - Local Hwy 762 Pipeline

Pros

- Does not require additional water licence capacity (91 acre feet already available)
- Does not need Alberta Environment approval (for water licence transfer).??
- Locally driven initiative, probably managed by Foothills County.??
- Utilises Water Treatment Plant facility, as is, with pumping capacity 12 m³ per hour ie 50 gallons per minute
- Provides local wildfire suppression coverage
- Future potential to extend pipeline eastward along Hwy 22 to Priddis
- In addition the existing reservoir can be enlarged if ever needed as Priddis grows

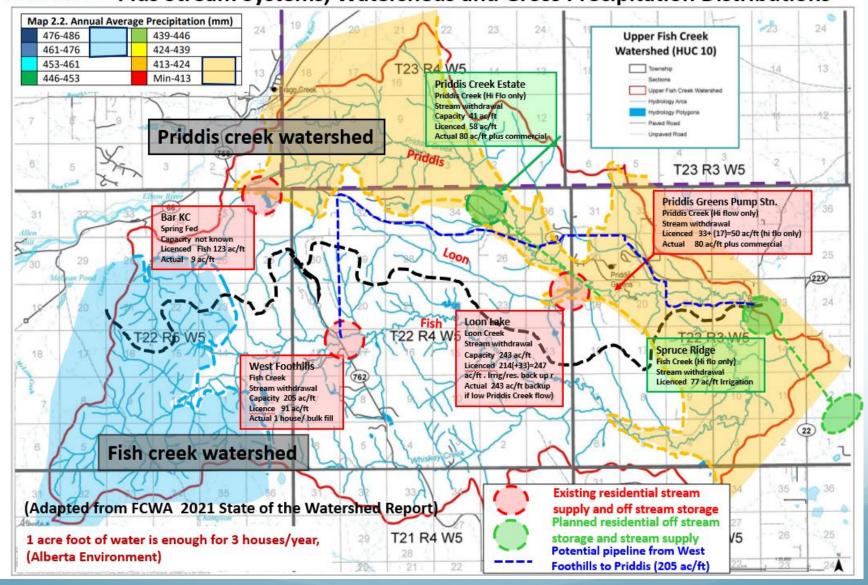
Cons

- Is more expensive for the Hwy 762 community – ballpark \$47k per home (without Government subsidy)
- Pumping capacity too low for hydrants
- Is the least beneficial for the watershed
- Will leave reservoir that is under-utilised
- Will not necessarily get a Alberta Government subsidy
- Hopefully would receive County approval
- Larger picture: years later may require the construction of additional off stream storage, as noted above, can be done!

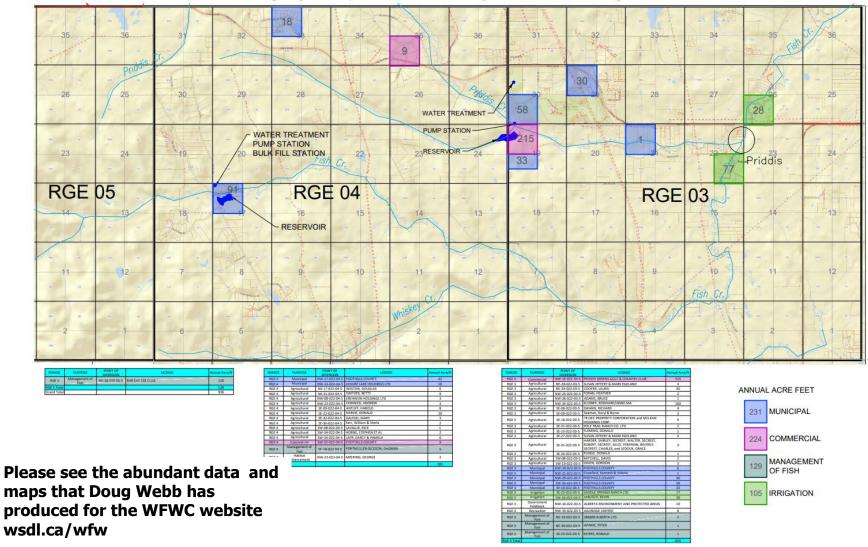
Note that with the increasing focus by the Alberta Government on water issues, especially rural, an application for financial assistance for this option may??? be looked on favourably...TBD!

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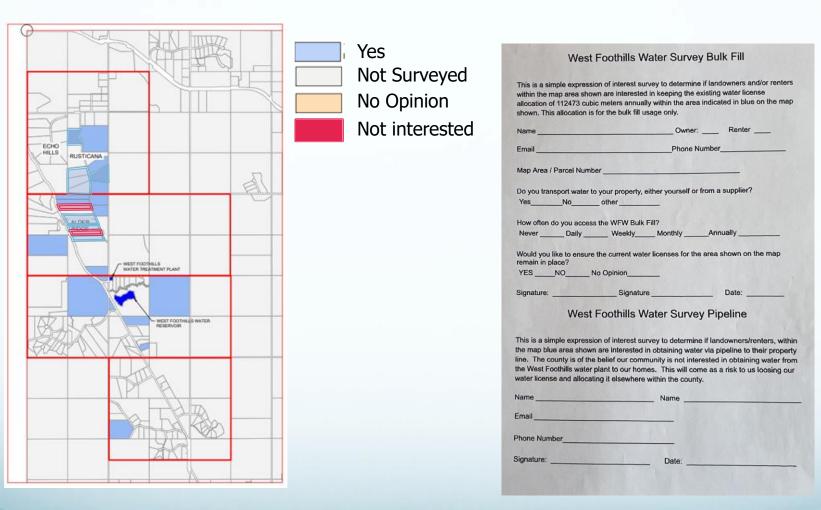
Fish Creek Watershed - Current and proposed residential water supply APPENDIX A. REFERENCE MAP SHOWING TOWNSHIP AND RANGE FOR THE UPPER FISH CREEK WATERSHED. Plus Stream Systems, Watersheds and Gross Precipitation Distributions



SURFACE WATER LICENSE POINT OF DIVERSION PARTIAL MAP (waterlicenses.alberta.ca) 2024-04-12 showing only Municipal, Commercial, Management of Fish, and Irrigation



SURFACE WATER LICENSE POINT OF USE SURVEY FOR NW-17-022-04 W5M



Adapted from Doug Webb's work on the WFWC website wsdl.ca/wfw