

## **Water Supply Options for Tanana, Alaska**

Stephen A. Hubbs

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The well providing water to Tanana failed last winter, resulting in a water supply crisis for the village. Efforts are underway to better understand the nature of the failure, and to identify options for providing a reliable year-round water supply for the village.

One option being considered is riverbank filtration, which involves constructing wells specifically designed to draw water from the river through the naturally occurring sands and gravels in the riverbed. For this process to be successful, there must be adequate water in the river and proper conditions on the riverbed and aquifer, and most importantly, the wells must be located in the zone of the river where the aquifer is permanently thawed.

The Yukon River and its underlying aquifer at Tanana appear to be suitable for riverbank filtration; however, the nature of the thaw bulb under the river and the condition of the riverbed (frozen or thawed) is unknown. To better assess the conditions that exist at Tanana, the following investigation is being considered:

1. Assemble local knowledge about the river in the vicinity of the Tanana water wells with regards to:
  - a. ice formation, thickness, and how this ice develops over time (freezing up or down, heaving)
  - b. water levels under the ice,
  - c. locations where drum ice and ice dams occur,
  - d. location of the winter channel and if it moves from year to year,
  - e. unusual flow patterns during break-up, and
  - f. any other anecdotal information regarding ice formation and river flow under the ice.
2. Gather new information on streambed conditions during winter at two cross-sections in the river (monitoring with a probing rod through the ice twice per month):
  - a. condition of riverbed under ice as winter progresses (frozen or thawed),
  - b. location and depth of channel,
  - c. river water levels under the ice.
3. Track progression of the thaw-bulb near the riverbank with pressure/temperature probes set in wells along the riverbank.

Information is currently being gathered from local sources and various agencies to support an efficient scope of work to accomplish the above investigation. The information gathered will be valuable in better understanding how to best construct wells for year-round water supplies along frozen streams.

