

5.57 Whitehorse Area - Golden Horn Firehall Water Supply System

The Golden Horn Firehall is located south of Whitehorse, Yukon at the intersection of Alaska Highway and Klondike Highway. Water for firefighting is supplied by an onsite water well and domestic water is supplied to the Firehall by bulk truck delivery. The firefighting water supply system consists of an approximately 38 m deep well (Well 1439) with a direct piped connection to the Firehall. As the system does not provide domestic water from the onsite water well, it is not governed under any present regulation intended to ensure safety measures and inspection for water and water sources for systems that provide water for human consumption.

5.57.1 Data Compilation Methodology

Tetra Tech approached stakeholders including water system operators and owners to let them know the project was in progress and to request their assistance in compiling the most complete data set possible. Through the process of compiling the data, Tetra Tech has had communication with the following water system owners, operators and proponents regarding the Golden Horn Firehall Water Supply System:

- YG Property Management Division – YG PMD has been consulted and has provided review comments and data for the compilation.
- YG Community Services (the client) – YG CS provided data for systems where proponents contacted were not able to find the documents and/or YG CS had the data readily available.

5.57.2 Hydrogeology

During drilling of the new Well 1439, a water-bearing zone consisting of silty gravel and sand was encountered at a depth of about 33.5 m bgs to 40 m bgs; the bedrock surface was encountered at a depth of about 40.2 m bgs (Tetra Tech 2009).

The well log does not indicate a thick sequence of finer-grained silt and clay overlying the aquifer (Tetra Tech 2009); thus, the vulnerability of the aquifer to surface sources of contamination is considered to be moderate to high. Results of the pumping test conducted on Well 1439 in October 2009 indicate an aquifer transmissivity on the order of 10^{-6} to 10^{-5} m²/s (0.1 to 1 m²/day) (Tetra Tech 2009).

The inferred groundwater flow direction based on topography and proximity to surface water sources is northeast or easterly direction towards the Yukon River (Tetra Tech 2006).

5.57.3 Well Summary

A well log for the new Golden Horn Firehall well (Well 1439) serving the new Firehall building is included in the GIS map and database portion of this project. The following table summarizes the completion characteristics of the well.

Well Construction Parameters	Details	Source
Date of construction	Well was completed by Double D Drilling Ltd. in October 2008	Well log
Total well depth	37.7 m bgs	
Casing	6" (152 mm) OD Steel Well Casing	

Table 5-153: Golden Horn Firehall, Well 1439 Summary

Well Construction Parameters	Details	Source
Casing depth	36.4 m bgs	
Well screen	1.3 m 15 slot (0.38 mm) stainless steel well screen from 35.1 m to 36.4 m bgs over 1.3 m 20 slot (0.51 mm) well screen from 36.4 m to 37.7 m bgs. Total exposed screen length is 2.6 m.	
Static water level	10.9 m bgs (October 2008)	Tetra Tech 2009
Sanitary seal	Bentonite sanitary seal to 6 m bgs	Well log and Tetra Tech 2009
Wellhead completion	Pitless Adaptor	
Wellhead stickup	1.0 m ags	Tetra Tech 2009
Well rated capacity	0.08 L/s (1.1 IGPM)	
Well GUDI status	Non-GUDI	
Well Construction Comments:	Well was constructed to meet Canadian Groundwater Association Well Construction Guidelines.	

5.57.4 Source Water Quality

The chemical water quality data of Well 1439 can be summarized as follows (Tetra Tech 2009):

- The water sample from Well 1439 was very hard (280 mg/L as CaCO₃) and can be characterized as a magnesium-calcium-bicarbonate-sulphate type water. The elevated hardness was considered to be generally poor for aesthetic purposes;
- Water from the well meets the GCDWQ for all the parameters analyzed on the date sampled, with the exception of the manganese concentration (0.06 mg/L) which slightly exceeded the GCDWQ AO of 0.05 mg/L; and
- Water from Well 1439 was similar to that from the existing Well 1924, with respect to water chemistry and type of water. An important distinction is that the arsenic concentration in the existing Well 1924, at 0.029 mg/L, exceeded the GCDWQ MAC of 0.01 mg/L for arsenic. The reported arsenic concentration in the new Well 1439, at 0.0036 mg/L, was below the GCDWQ MAC on the date sampled.

5.57.5 Water Treatment and Distribution

Domestic water for the Firehall users is supplied by trucked delivery to a 250-gallon water storage tank.

Table 5-154: Golden Horn Firehall Water Treatment and Distribution Details

Item	Details	Source
Owner/Operator	Government of Yukon	Tetra Tech 2009
Water source	Groundwater	

Table 5-154: Golden Horn Firehall Water Treatment and Distribution Details		
Item	Details	Source
Well serving the system	Golden Horn Firehall well (Well 1439)	
Treatment type	None	
Water users	Firewater supply only	p.c. Nick Barnett 2017
Delivery method	Direct connection to Firehall holding tanks	
Age of system/last known update	The new Firehall was completed in 2009	

5.57.6 Source Water Protection Planning

No records were found indicating that a source water protection plan has been completed for the new Golden Horn Firehall Well 1439. Given the limited nature of water distribution here (water is used only for firefighting and domestic water supply in the Firehall), source water protection planning may not be warranted for this water supply.

Tetra Tech completed a Phase 1 GUDI screening for the well in 2009 and based on the screening results, Well 1439 is considered to be a groundwater source, and not under the direct influence of surface water based on the Phase 1 screening assessment (Tetra Tech 2009).

5.57.7 Water Supply Information Data Gaps

Tetra Tech has obtained review comments from YG PMD regarding the current status of this system and to our knowledge this summary is complete and accurate to March 2017. The following data gaps have been identified:

- There is no source water protection planning in place to protect this groundwater resource; however, considering that the water supply system provides only fire protection water, it is not likely warranted at this site