

5.21 Dawson City - Airport Terminal Building Public Water Supply System

Dawson City Airport is located on the North Klondike Highway approximately 15 km east of Dawson City. The Airport Terminal Building is approximately 400 m from the Klondike River at its closest point. The Dawson Airport Terminal Building (ATB) is served by a groundwater well, Well W-2544, located approximately 4 m east of the ATB. The water system supplies potable water to the airport workers, flight crews and members of the public who utilize the building and is governed under the Sections 12.1 (a) and (b) and 17 of the *Public Health and Safety Act* and Section 5 of the *Public Health Regulations* (C.O. 1958/079, O.I.C. 2009/194), which require safety measures and inspection for water and water sources for systems that provide for human consumption.

5.21.1 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 YG PMD regarding all water systems they operate and/or maintain. YG PMD has provided review comments and data for the compilation.

5.21.2 Hydrogeology

The Dawson City ATB well is situated southeast of the Klondike River and is completed within alluvial floodplain deposits from the river. Water levels and groundwater flow direction in the aquifer are likely closely connected to water levels in Klondike River. The groundwater flow direction in the vicinity of the well is inferred from topography and the proximity to surface water to be northwest toward the Klondike river.

The Dawson City ATB well is completed at a depth of 12.2 m bgs in a coarse gravel, cobble and boulder aquifer. The well log does not indicate the presence of any fine-grained material in the sequence overlying the aquifer, and the static water level is quite shallow at 4.7 m bgs. The aquifer is very vulnerable to surface sources of contamination due to the shallow static water level and the well construction because it lacks a surface seal. An abandoned well is also located on the property in the crawl space under the terminal building approximately 9 m from the well that is in use.

5.21.3 Well Summary

A partially complete well log for the Dawson City ATB Well is included in the GIS map and database portion of this project. The following table summarizes available data for the water well.

Table 5-52: Dawson City Airport Terminal Building, Well W-2544 Summary		
Well Construction Parameters	Details	Source
Date of construction	Completed by Midnight Sun Drilling Co. Ltd. in September 1988	Well Log
Total well depth	12.2 m bgs	
Casing	6" (155 mm) ID steel casing	
Casing depth	11.4 m bgs	
Well screen	0.8 m 18 slot (0.46 mm) steel well screen installed from 11.4 m bgs to 12.2 m bgs	

Table 5-52: Dawson City Airport Terminal Building, Well W-2544 Summary

Well Construction Parameters	Details	Source
Static water level	4.7 m bgs	Tetra Tech 2006
Sanitary seal	No surface seal	
Wellhead completion	Split gasket cap, well pit	
Wellhead stickup	0.45 m bgs	
Well rated capacity	1.26 L/s (16.6 IGPM) (estimated by the driller)	Well Log
Well GUDI status	Potentially GUDI	Based on shallow depth and well construction – there is no surface seal in place
Well Construction Comments:	Well likely does not have a surface seal and is not constructed to meet the Canadian Groundwater Association Well Construction Guidelines.	

5.21.4 Source Water Quality

As part of the SPDWSA review conducted in 2005, Tetra Tech reviewed available groundwater chemistry data and collected an additional sample to test for identified parameters of concern. The observations made in 2005 are summarized below:

- The water was calcium-bicarbonate type with a pH of approximately 7.4 and was considered moderately hard with a measured hardness of 170 mg/L (as CaCO₃);
- All GCDWQ health-based criteria and aesthetic objectives were met for the parameters analyzed; and
- Review of chloride, nitrate and nitrite showed all three to be low and within the normal background ranges, suggesting that the aquifer was not under the influence of anthropogenic surface sources of nutrients or anions such as septic wastes at the time of sampling.

5.21.5 Water Treatment and Distribution

Table 5-53: Dawson City Airport Terminal Building Water Treatment and Distribution Details

Item	Details	Source
Owner/Operator	Government of Yukon	Tetra Tech 2006 p.c. Nick Barnett 2017 p.c. Michael Fraser 2107
Water source	Groundwater	
Wells serving the system	Dawson ATB well	
Treatment type	None	
Water users	Airport workers, flight crews and passengers	
Delivery method	Piped connect directly to ATB	

Table 5-53: Dawson City Airport Terminal Building Water Treatment and Distribution Details

Item	Details	Source
Age of system/last known update	Unknown	

5.21.6 Source Water Protection Planning

There is no Source Water Protection Planning in place for the Dawson City ATB Well 2544. Given the unconfined, vulnerable nature of the aquifer and the industrial nature of work at the site (including significant fuel storage), a SWPP would provide a valuable tool for identifying, monitoring and managing risks to the wells and aquifer.

Potential sources of contamination in the vicinity of the wellhead that were identified as part of the 2005 SPDWSA site review, included:

- A septic holding tank located 28 m from the well;
- An AST located 30 m from the well;
- An abandoned well 9 m from the well; and
- Several spills have occurred at the airport over the history of operation.

5.21.7 Water Supply Information Data Gaps

YG PMD has reviewed this summary and provided comments. To our knowledge, this system is accurate and up to date as of March 2017. Tetra Tech identified the following data gaps:

- There is no source water protection planning for this groundwater resource, source water protection planning here could be incorporated into a greater City of Dawson SWPP and provide comprehensive planning to protect the shallow water resources in the area that are closely tied to the Klondike and Yukon rivers;
- An adequate water treatment system consisting of filtration (to 1 micron absolute) and UV disinfection was recommended for this system; however, it is our understanding that no updates have been completed to the system since 2006;
- Ongoing monitoring of the water quality for impacts from petroleum products, drilling of a new well or conversion of the water system to trucked deliver was recommended for this system, and YG PMD was not able to confirm if these changes have been implemented.