

## 5.54 Whitehorse – Lobird Park Water Supply System

40023 Yukon Inc. (leased to Chena Corporation) owns and operates one public drinking water system at Lobird Park (trailer park), located approximately 1 km west of the Alaska Highway and about 3 km south of the Hillcrest Subdivision, in Whitehorse, Yukon. The system obtains water from five deep drilled groundwater wells (Wells 1, 2, 4, 6 and 8) and is supplemented by water delivery provided by Yukon Water Services due to low groundwater well yields (Tetra Tech 2012). Well 6 is used only seasonally due to freezing issues (Tetra Tech 2012). Wells 1, 2 and 4 are located next to Ice Lake. Wells 6 and 8 are located next to the Radar Apartments and at the north end of Lobird Park, respectively. Three additional wells, Wells 3, 5 and 7, have not been in use since about 2003 (Jacobsen 2003). The system is classified as a Large Public Drinking Water Supply System under the Yukon Drinking Water Regulations – Guidelines for Part I – Large Public Drinking Water Systems (YG 2007).

### 5.54.1 Data Compilation Methodology

Tetra Tech approached the water system stakeholders including the water system owner/operator and regulators to let them know the project was in progress and to request their assistance in compiling the most complete data set possible. Data regarding the Lobird Park water supply system was requested from the following proponents:

- Lobird Water System Owner/Operator Blake Battersby was contacted and provided review comments for the system summary.
- YG Environmental Health – YG EHS was contacted for use of the 2012 LPDWS review report, verification of source water protection planning and to provide review comments and feedback throughout the project.

### 5.54.2 Hydrogeology

Wells 1, 2 and 4 are completed in bedrock at depths ranging from 103.6 m to 216.4 m bgs near Ice Lake. According to the well logs for these wells, the depth to bedrock is relatively shallow, ranging from 2.1 m to 6.7 m bgs. Wells 6 and 8 are located in the Lobird Park area and completed in bedrock to 74.7 m bgs and 93 m bgs, respectively, overlain with approximately 7 m of overburden. The bedrock type is not indicated on the driller's well records; however, based on surficial geology maps for the area, it is anticipated to be granodiorite. Approximate well yields indicated on the well logs suggest that the bedrock aquifer (fractures) that the wells intersect have low yields, typical of a granodiorite (Tetra Tech 2012).

Bedrock aquifers can be subject to rapid transport of potential contaminants of concern, particularly when there is little overburden cover over the bedrock, or when there are bedrock outcrops nearby. The vulnerability of the bedrock aquifer was not assessed as the well logs had insufficient information regarding well fractures and discontinuities to identify aquifer zones and to semi-quantitatively evaluate the vulnerability (Tetra Tech 2012).

Wells 1, 2, 3, 4 and 5 are located within 60 m of the nearest surface body of water, Ice Lake. The nearest water body to Wells 6, 7 and 8 are the Lobird sewage treatment lagoons located about 400 m south of Well 8 and Icy Lake about 900 m northeast of Well 7.

### 5.54.3 Summary of Wells

The well logs for the five wells serving the Lobird Park drinking water system are included in the GIS map and database portion of this project. The following tables summarize the completion characteristics of the public drinking water wells at Lobird Park.

**Table 5-142: Lobird Public Drinking Water System, Well 1 Summary**

Well Construction Parameters	Details	Source
Date of construction	Well was completed by Midnight Sun Drilling Co. Ltd. in August 1986	Well log
Total well depth	216.4 m bgs	
Casing	6" (152 mm) OD Steel Well Casing	
Casing depth	Approximately 13 m bgs (approximately 2 m into bedrock)	
Well screen	No well screen installed	
Static water level	Approximately 1.7 m bgs (August 1988)	
Sanitary seal	No record of sanitary seal installation. Wellhouse has a concrete floor.	Tetra Tech 2012
Wellhead completion	The wellhead is equipped with an improvised plastic well cap. Housed in a locked wooden enclosure, freeze protected with heat trace extending into the well.	
Wellhead stickup	Approximately 0.5 m ags	
Well rated capacity (estimated by the driller)	0.27 to 0.3 L/s (3.5 to 4.0 IGPM)	Well log
Well GUDI status	Potentially GUDI	Tetra Tech 2012
Well Construction Comments:	Well was not constructed to meet Canadian Groundwater Association Well Construction Guidelines.	

**Table 5-143: Lobird Public Drinking Water System Well 2 Summary**

Well Construction Parameters	Details	Source
Date of construction	Well was completed by Midnight Sun Drilling Co. Ltd. in July 1985	Well log
Total well depth	103.6 m bgs	
Casing	6" (152 mm) OD Steel Well Casing	
Casing depth	3.5 m bgs	
Well screen	No well screen installed	
Static water level	2.2 m bgs (July 1985)	
Sanitary seal	No record of sanitary seal installation. Wellhouse has a concrete floor.	Tetra Tech 2012

**Table 5-143: Lobird Public Drinking Water System Well 2 Summary**

Well Construction Parameters	Details	Source
Wellhead completion	The wellhead is equipped with an improvised plastic well cap. Housed in a locked metal enclosure, freeze protection consists of heat trace extending into the well.	Well log
Wellhead stickup	Approximately 0.5 m ags	
Well rated capacity (estimated by the driller)	0.38 L/s (5 IGPM)	
Well GUDI status	Potentially GUDI	Tetra Tech 2012
Well Construction Comments:	Well was not likely constructed to meet Canadian Groundwater Association Well Construction Guidelines.	

**Table 5-144: Lobird Public Drinking Water System, Well 4 Summary**

Well Construction Parameters	Details	Source
Date of construction	Well was completed by Midnight Sun Drilling Co. Ltd. in October 1990	Well log
Total well depth	112.8 m bgs	
Casing	6" (152 mm) OD Steel Well Casing	
Casing depth	6.5 m bgs (4 m into bedrock)	
Well screen	No well screen installed	
Static water level	3.4 m bgs (October 1990)	
Sanitary seal	No record of sanitary seal installation.	Tetra Tech 2012
Wellhead completion	The wellhead is equipped with an improvised plastic well cap. Housed in a locked wooden enclosure, freeze protected with heat trace extending into the well.	Tetra Tech 2012
Wellhead stickup	0.75 m ags	Tetra Tech 2012
Well rated capacity (estimated by the driller)	0.04 L/s (0.5 IGPM)	Well Log
Well GUDI status	Potentially GUDI	Tetra Tech 2012
Well Construction Comments:	Well was not likely constructed to meet Canadian Groundwater Association Well Construction Guidelines.	

**Table 5-145: Lobird Public Drinking Water System, Well 6 (Seasonal Use Only) Summary**

Well Construction Parameters	Details	Source
Date of construction	Well was completed by Midnight Sun Drilling Co. Ltd. in June 1990	Well log
Total well depth	74.7 m bgs	
Casing	6" (152 mm) OD Steel Well Casing	
Casing depth	12 m bgs (5 m into bedrock)	
Well screen	No well screen installed	
Static water level	8.5 m (June 1990)	
Sanitary seal	No record of sanitary seal installation.	Tetra Tech 2012
Wellhead completion	The wellhead is equipped with an improvised plastic well cap. Housed in a locked wooden enclosure and equipped with freeze protection.	p.c. Blake Battersby 2017
Wellhead stickup	0.5 m ags	Tetra Tech 2012
Well rated capacity (estimated by the driller)	0.27 L/s (3.5 IGPM)	Well log
Well GUDI status	Potentially GUDI	Tetra Tech 2012
Well Construction Comments:	Well was not likely constructed to meet Canadian Groundwater Association Well Construction Guidelines.	

**Table 5-146: Lobird Public Drinking Water System, Well 8 Summary**

Well Construction Parameters	Details	Source
Date of construction	Well was completed by Midnight Sun Drilling Co. Ltd. in October 1997	Well log
Total well depth	93 m bgs	
Casing	6 5/8" (168 mm) OD Steel Well Casing	
Casing depth	7.5 m bgs (1 m into bedrock)	
Well screen	No well screen installed	
Static water level	25.1 m bgs (October 1997)	
Sanitary seal	No record of sanitary seal installation.	Tetra Tech 2012
Wellhead completion	The wellhead is equipped with an improvised plastic well cap. Housed in a locked wooden enclosure and freeze protection consists of heat trace.	

**Table 5-146: Lobird Public Drinking Water System, Well 8 Summary**

Well Construction Parameters	Details	Source
Wellhead stickup	0.55 m ags	
Well rated capacity	0.38 L/s (5 IGPM)	Well log
Well GUDI status	Potentially GUDI	Tetra Tech 2012
Well Construction Comments:	Well was not likely constructed to meet Canadian Groundwater Association Well Construction Guidelines.	

### 5.54.4 Source Water Quality

In 2012, as part of the LPDWSA, Tetra Tech reviewed water quality results for the Lobird Park wells from 2005 to 2010. The following summary is based on the water quality review from that report:

- Water from the wells serving the Lobird system is mixed and treated for uranium before the sampling point, the water quality, after uranium removal, is characterized as calcium-bicarbonate type with a pH of 7.2 to 7.5 and is considered very hard with a measured hardness of 363 mg/L;
- The combined treated water source from the Lobird Park public drinking water system meets the GCDWQ with the exceptions of the AO for total manganese and the MAC for total uranium;
- Manganese in treated water sample is in exceedance of the GCDWQ AO value in 2008, but is found to be below the GCDWQ AO value in 2009 and 2010; and
- In June 2010, the uranium concentration in the treated water sample exceeded the GCDWQ MAC. Environmental Health and the system operator investigated the issue and found that the resin in the uranium treatment system was not working properly. We understand that the water well use was discontinued until a new larger pre-filter was installed and the system was shown to be working properly.

### 5.54.5 Water Treatment and Distribution

**Table 5-147: Lobird Public Drinking Water System Water Treatment and Distribution Details**

	Details	Source
Owner/Operator	40023 Yukon Inc. (leased to Chena Corporation)	
Water source	Blended groundwater supplemented with trucked water delivery from City supply	Tetra Tech 2012
Number of wells serving the system	Wells 1, 2, 4 and 8 (year round). Well 6 used in summer	
Treatment type	Chlorination, aeration and uranium removal	Jacobsen 2003 and Tetra Tech 2012
Number of connections	Approximately 250 people	

<b>Table 5-147: Lobird Public Drinking Water System Water Treatment and Distribution Details</b>		
	<b>Details</b>	<b>Source</b>
Delivery method	Piped	
Age of system/last known major work	Installation of a new larger capacity pre-filter after 2012 to allow the uranium removal system to operate correctly	

### 5.54.6 Source Water Protection Planning

Some preliminary source water protection planning has been completed for this system in the form of a review of risk assessment tools for small community water supplies completed by Health Canada in 2009. The Lobird Park System was used as an example system for assessing the performance of the Australian Community Water Planner and the Ontario Risk Categorization Tool.

The pilot study identified potential risk scenarios but lacks key source water protection plan components including:

- Report does not identify well capture zones or wellhead protection areas;
- Report does not provide a thorough summary of risks to the groundwater resource;
- Report does not provide a summary of potential contaminant sources;
- Report does not provide any graphics or maps showing potential contaminant sources;
- Report does not evaluate the level of risk posed to the water system users; and,
- No recommendations for improving source water security or managing potential risks to the system are provided.

### 5.54.7 Water Supply Information Data Gaps

Tetra Tech has completed the LPDWSA work for the Lobird Park in 2012, review comments have been provided by the water system owner and operator and YG EHS has provided data where available. We have identified the following data gaps:

- While some preliminary assessment of risk to the system has been completed, no SWPP is in place for this system. As the wells are completed in two areas, with Wells 1 through 5 completed in close proximity to a surface water body and Wells 6, 7 and 8 located in close proximity to anthropogenic sources of contamination, Tetra Tech recommends developing a formal SWPP for this system.
- Tetra Tech had recommended the decommissioning of Wells 3, 5 and 7 and possibly Well 8 in 2012; however, we understand that Wells 3, 5, and 7 are not in use, but will be maintained for potential future use and that use of Well 8 will be continued; and
- Tetra Tech was not able to find any record that a GUDI assessment has been completed on the wells.