

## 5.28 Marsh Lake - Army Beach Water Supply System

Army Beach is located at km 1379 on the Alaska Highway on the shores of Marsh Lake. Government of Yukon Department of Community Services owns and operates the small public self-serve system. This system obtains surface water from a directionally drilled high density polyethylene (HDPE) intake structure that extends about 600 m southeast into Marsh Lake. 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.

### 5.28.1 Data Compilation Methodology

Tetra Tech approached stakeholders including YG departments, 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 obtained data regarding the Army Beach Water Supply system from the following proponents:

- YG Community Services (the client) – YG CS provided data for the Army Beach Water Supply as this system is owned and operated by YG CS. The YG CS operator provided review comments and edits for the final summary to ensure completeness and accuracy.

### 5.28.2 Hydrology

Marsh Lake is one of the Southern Lakes, which are the long and narrow glacier fed lakes that form the headwaters of the Yukon River. Marsh Lake is drained by the Yukon River to the North, and although it is a lake, water here flows slowly northward. The Southern Lake Watershed upstream of Marsh Lake includes Atlin, Teslin, Tagish, Tutshi, Bennett and Nares Lakes to the south. Several small sediment laden rivers and creeks also flow into Marsh Lake near Army Beach.

The lake level fluctuates up to 3.5 m annually and the level is partially controlled by Yukon Energy Corporation's Lewes River control structure.

The Army Beach public drinking water system obtains water from a surface water source, thus, is inherently vulnerable to potential contamination including anthropogenic sources, viruses and naturally occurring bacteria ubiquitous in surface water sources.

### 5.28.3 Intake Details

The following tables summarize the intake details of the system.

<b>Table 5-71: Marsh Lake/Army Beach Water Intake</b>		
<b>Construction Parameters</b>	<b>Details</b>	<b>Source</b>
Date of construction	2009 (directional drilling), Pumping systems in 2010.	Tetra Tech 2010
Intake	600 m long x 200 mm diameter high density polyethylene (HDPE), directionally drilled, with screened intake installed on welded baseplate with concrete anchor blocks. Screen is approximately 2.6 m above bottom of lake, approximately 4 m below low water level. (Dayton and Knight Phase 1 Drawings, 2009)	
Pump	Submersible 5 HP 208 V, 3 phase Series 12 Model No. WSOPT12-6 SurePump installed June 2010 by Norcope.	

### 5.28.4 Source Water Quality

The system was brought on line in June of 2010, the following are the key observations and comments noted on the water quality:

- The raw water sample collected from the Marsh Lake intake in November 2010 met GCDWQ for the parameters analyzed (Tetra Tech 2010); and,
- The turbidity of treated water (0.04 NTU) at the water treatment plant was within the GCDWQ requirement of 0.1 NTU (Tetra Tech 2010).

Tetra Tech did not review recent water quality data but understands water chemistry analysis is completed at this system annually and bacteriological monitoring is completed on a regular basis with results sent to YG EHS for review.

### 5.28.5 Water Treatment and Distribution

The Army Beach water treatment system was completed in 2010 and is equipped with a membrane filtration and chlorination system (YES 2012).

Item	Details	Source
Owner/Operator	Government of Yukon Department of Community Services	
Water source	Surface Water (Marsh Lake)	
Treatment type	Filtration (0.02 micron) and chlorination	YES 2012
Number of connections	~150 residents	p.c. Steve Perrin 2017
Delivery method	Self-serve fill station including blue jug fill, 2" pickup truck fill and 4" overhead fill for bulk water	
Age of system/last known update	The system was completed in 2010	

### 5.28.6 Source Water Protection Planning

There is no SWPP in place for the Army Beach public drinking water system. Given that this water system provides potable water for public consumption, a SWPP would provide a valuable tool for identifying, monitoring and managing risks to the water supply. However, as the water supply is comprised of the entirety of the Yukon Southern Lakes, a comprehensive SWPP covering this surface water resource might be the best and most complete approach.

### 5.28.7 Water Supply Information Data Gaps

Tetra Tech has reviewed available data from the 2012 LPDWSA and the summary has been reviewed by YG CS water system operators. 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 for this water system. As source water protection planning for this surface water system would involve the entire Southern Lakes watershed and headwaters of the Yukon River, an integrated approach to water resource management with multiple proponents and stakeholders would likely be required to create a SWPP here.