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**CLINTON CREEK SITE**

**2019 BAT INVESTIGATION**

**REPORT**

**PREPARED FOR:**

GOVERNMENT OF YUKON  
ASSESSMENT AND ABANDONED MINES  
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PROJECT NO. 19-297  
DECEMBER, 2019

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# CLINTON CREEK SITE – 2019 BAT INVESTIGATION REPORT

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## 1. INTRODUCTION

The Government of Yukon, Assessment and Abandoned Mines Branch (AAM) is preparing for the remediation of the Clinton Creek Site (the Site), an abandoned asbestos mine located approximately 75 km northwest of the City of Dawson, Yukon (100 km by road). The mine operated from 1967 to 1978 and 940,000 tonnes of white chrysotile asbestos was mined from three pits. The Site is located within the traditional territory of Tr'ondëk Hwëch'in First Nation (THFN).

As part of the planning process, Ecological Logistics & Research Ltd. (ELR) was retained by AAM to conduct a bat investigation to establish whether bats occur at the Site. This information will help inform the Site planning process, including the environmental and socio-economic effects assessment that will be required as part of the Site remediation process. This report summarizes information from the bat studies conducted at the Site in 2019.

## 2. SURVEY OBJECTIVES AND BACKGROUND

The study objectives were to establish whether bats occur at the Site and, if they do, to identify the species of bats and to investigate where they may be roosting. These objectives were based on the concept that if bats are present and roosting in some of the mine related infrastructure, then this would need to be identified and considered as part of the remediation planning process.

The most likely bat species that would occur at the Site is Little Brown Myotis (*Myotis lucifugus*), a species that, relatively recently, became a species of conservation concern (November 2014) when it was federally listed as “Endangered” under the *Species at Risk Act* (Government of Canada 2019). The northern range of Little Brown Myotis does overlap with the Site (International Union for the Conservation of Nature 2019) and bats are known to occur in the Dawson City area, which is approximately 77 km southeast of the Site (*pers. comm.* Mike Sutor, North Yukon Regional Biologist, Government of Yukon. June 25, 2019). Also, an individual who lives near the Site believes they observed bats flying at the Forty Mile town site in the summer of 2019, approximately 10 km southeast of the Site.

## 3. SURVEY METHODS

### 3.1 PRE-FIELD PREPARATION

ELR reviewed satellite imagery of the Site to establish potential locations to temporarily deploy two bat recorders, bearing in mind likely bat foraging and roosting areas, accessibility for the field crew, and equipment security. The recorders were to be placed near water and/or close to open areas of vegetation. The satellite imagery was also reviewed to help determine pathways for transect encounter surveys.

### 3.2 FIELD SURVEYS - STATIC BAT RECORDERS

ELR deployed two static bat sound recorders at the Site. The programmable recorders (Wildlife Acoustics SM4 Full-Spectrum Ultrasonic Recorders), designed for the long-term monitoring of bats, are connected to an ultrasonic microphone (SMM-U2). The recorders detect and record bat echolocation calls (saved as

waveform audio file format files or WAV files) that can be later analyzed using specialized software to determine which species has been recorded.

One bat recorder (BAT#1) was installed a short distance from the Site's main entrance gate, within a wetland area close to Clinton Creek (Figure 2). The second bat recorder (BAT#2) was installed at the former mill location where there is potential roosting infrastructure such as concrete foundations from ore handling infrastructure (herein referred to as concrete foundations). Both recorders were programmed to continuously monitor for bats between 11:00 pm and 3:00 am each night and would record the sounds with:

1. A frequency higher than 25 KHz (when searching, Little Brown Bats' lowest call frequency is typically around 40 KHz);
2. A duration of at least 1.5 milliseconds (ms); and
3. A minimum volume of 12 decibels (dB).

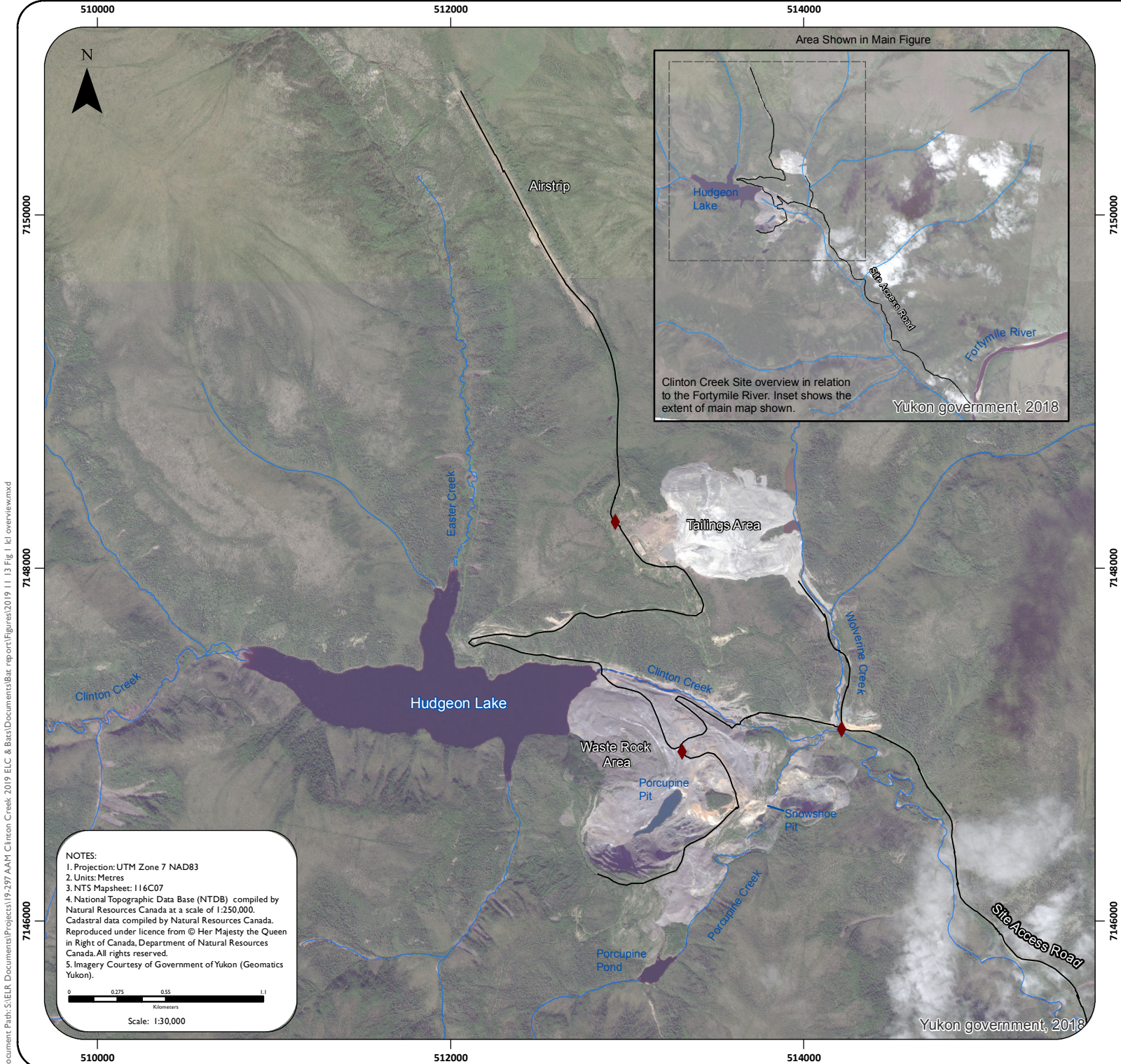
### **3.3 FIELD SURVEYS – BAT ENCOUNTER TRANSECT SURVEY AND STATIC OBSERVATIONS USING A HANDHELD BAT MONITOR**

ELR completed encounter transect surveys at several locations around the Site with the intention to target bat foraging areas and potential roosting locations. The surveys were planned for between 11:30 pm and 3:00 am. The transects were completed on foot, with movement between transects either on foot or by truck. It was just as effective to observe the wetland area from the main access road for bats as it was to move through the wetland, and so at least two static observations of the wetland were completed from the road.

During the surveys, the crew would observe for flying bats (easily seen when they are flying against the night sky). A handheld bat monitor (Echo Meter Touch 2 Pro) was also used to “listen” for bat calls. The monitor is plugged into a smartphone and converts higher frequency sounds to a lower frequency that can be heard by humans. The monitor could be set to record bat calls if bats were observed. The location of any sound detections is also automatically recorded when the monitor records bat calls. Other information (e.g., temperature, wind, precipitation, and any incidental wildlife life observations) were also noted by the field crew during the surveys.

### **3.4 BAT CALL ANALYSIS**

ELR analyzed all recordings collected on Site by the static and handheld monitors using Kaleidoscope Pro software Version 5.1.9g. This software allows hundreds of bat recordings to be analyzed both automatically and manually. The software is capable of analyzing recordings using multiple parameters in order to screen out poor quality recordings and increase the user's confidence in the auto-identification function. The parameter settings used to process all the recordings were based on Reichart et al. (2018) *A Guide to Processing Bat Acoustic Data for the North American Bat Monitoring Program (NABat)*. Once the recordings were processed, the data from any auto-identified bat species that were not anticipated to occur on Site (e.g. outside of their regular ranges) were reviewed individually against published call data (MELP 1998, Fenton and Bell 1981, Broders et al. 2004) to determine if the recordings had been misidentified, because auto-identification software can confuse some bat calls (Reichart et al. 2018). Further, any WAV files auto-identified as noise files were manually reviewed to check if the recordings could potentially be those of bats.



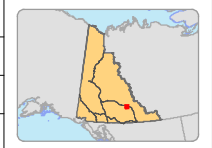
Client:



**LEGEND**

- Primary Site Roads
- Watercourses
- ◆ Site Gates

Drawn by: C. Jastrebski  
 Approved by: C. Jastrebski  
 Date: March 28, 2019  
 ELR Project: 18-278



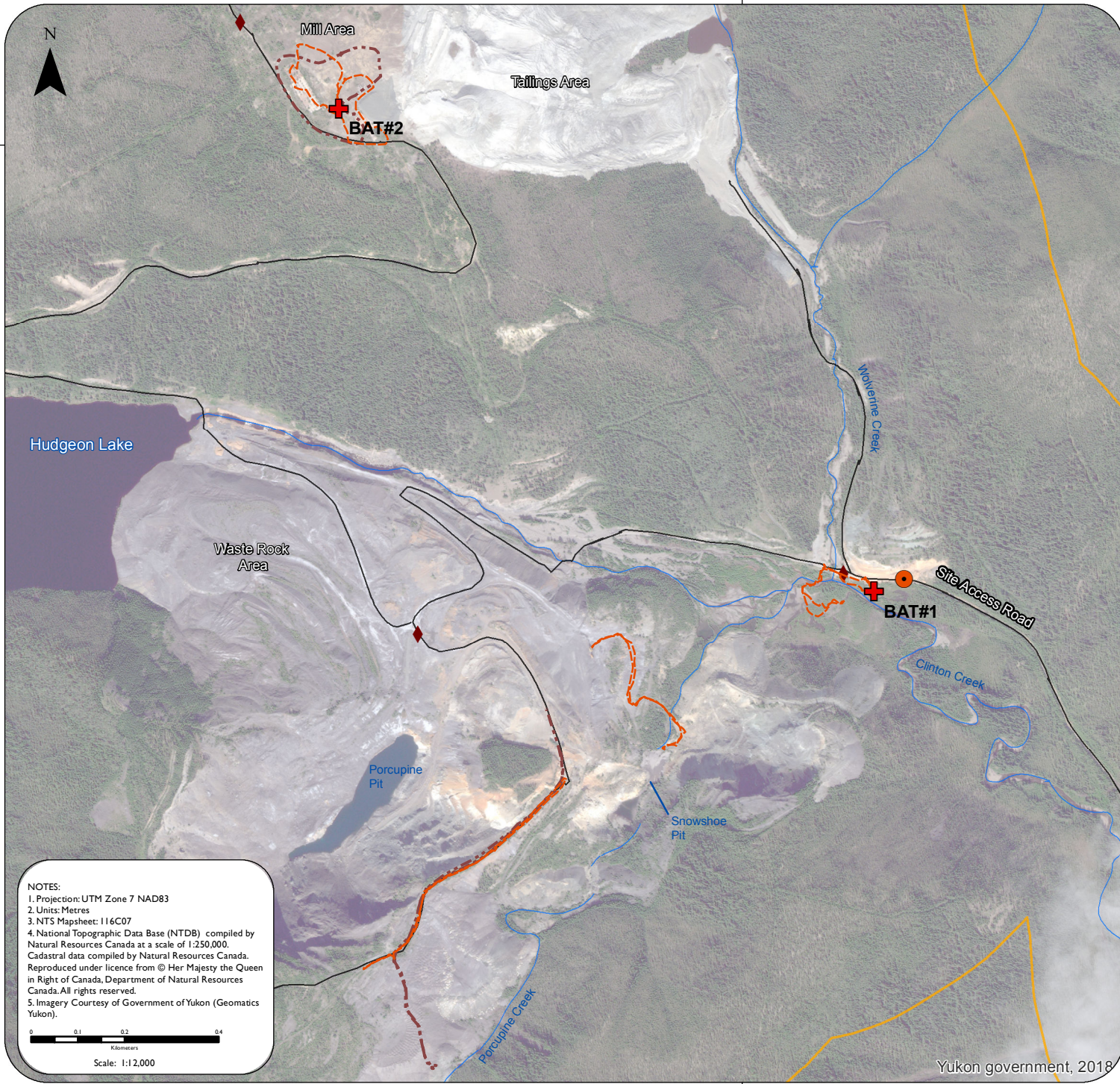
**CLINTON CREEK SITE**  
 Terrestrial Existing Conditions Studies

**FIGURE I**  
 Clinton Creek Site Local Overview

**NOTES:**  
 1. Projection: UTM Zone 7 NAD83  
 2. Units: Metres  
 3. NTS Mapsheet: 116C07  
 4. National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:250,000. Cadastral data compiled by Natural Resources Canada. Reproduced under licence from © Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.  
 5. Imagery Courtesy of Government of Yukon (Geomatics Yukon).

0 0.25 0.5 1.1  
 Kilometers  
 Scale: 1:30,000

Document Path: S:\ELR Documents\Projects\19-297\AMN Clinton Creek 2019 ELC & Bas\Documents\Bas report\Figures\2019 11 13 Fig 1 lel overview.mxd



**NOTES:**  
 1. Projection: UTM Zone 7 NAD83  
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 3. NTS Mapsheet: 116C07  
 4. National Topographic Data Base (NTDB) compiled by Natural Resources Canada at a scale of 1:250,000. Cadastral data compiled by Natural Resources Canada. Reproduced under licence from © Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.  
 5. Imagery Courtesy of Government of Yukon (Geomatics Yukon).

0 0.1 0.2 0.4  
 Kilometers  
 Scale: 1:12,000

Yukon government, 2018



Client:



- Primary Site Roads
- Watercourses
- ◆ Site Gates
- ▭ Wildlife Study Area
- ⊕ Bat Recorder Locations
- June 25 & August 22-23 2019 Bat Static Survey Location
- - - June 26 2019 Transects
- - - August 22-23 2019 Transects

Drawn by: C. Jastrebski

Approved by: C. Jastrebski

Date: November 12, 2019

ELR Project: 19-297



**CLINTON CREEK SITE**  
 Terrestrial Existing Conditions Studies

**FIGURE 2**  
 Clinton Creek Bat Survey Information

ELR reviewed the potentially erroneously identified calls using the lowest and highest frequencies in a sequence of bat calls, typical call sweep frequencies (the frequencies at the beginning and end of each call), the duration of each call, the call frequencies with the highest energy (power), and the presence or absence of harmonics.

## 4. RESULTS

### 4.1 STATIC BAT RECORDERS

The two bat recorders were deployed at the Site between June 25 and August 22, 2019 (62 nights total).

BAT#1 detected and recorded 55 sounds between June 26 and August 21. When batch processed using the Kaleidoscope Pro software, 51 of these recordings were classified as noise files and 4 files were classified as “no identification”. All of the no identification files and every third noise recording were reviewed manually and none of the recordings were observed to resemble bat calls (i.e., the minimum frequencies were too low, the calls were too short or too long in duration, had no defining sweep or pulse, and the decibel range was uncharacteristic).

BAT#2 detected and recorded five sounds over four separate nights in July and August during the overall sample period of June 26 to August 21. When batch processed using the Kaleidoscope Pro software, all five were classified as noise files. All five files were then manually reviewed and none of the recordings resembled bat calls.

### 4.2 ENCOUNTER TRANSECT SURVEYS

An encounter survey was started at midnight on June 25, 2019. There was no wind, the temperature was approximately 13°C, and there was very light rain. Figure 2 shows the locations of the static observation and transects. By the time the crew reached the mill area the rain was heavier and the survey was abandoned for the night at 2:00 am because it would not be possible to detect bats if they were present. A second survey was completed on June 26 2019 with better weather conditions. The temperature was about 13°C, there was no wind or precipitation and the field crew walked four separate transects between 12:50 am and 3:30 am (Figure 2). No bats were detected during the first or second survey.

A third survey was conducted on the night of August 22/23 between 11:15 pm and 1:00 am. The weather conditions were fair, 3 to 5°C, no wind or precipitation but there was some mist towards the end of the survey. The wetland area by the main gate, the mill area and the area southeast of Porcupine Pit were targeted (Figure 2). No bats were detected during this third survey.

### 4.3 INCIDENTAL WILDLIFE OBSERVATIONS

When static bat detector BAT#2 installed at the mill area on June 25 a Say's Phoebe (*Sayornis saya*) nest was located in one of the concrete foundations (Figure 2). There were at least two nestlings in the nest and an agitated adult bird was flying and calling nearby. A second Say's Phoebe nest was likely present on June 25 within a concrete foundation southeast of Porcupine Pit (Figure 2). The nest was not observed directly but two agitated adult birds were flying nearby when the anchor was investigated for possible signs of bats (i.e., roosting bats or droppings). Say's Phoebe is not considered to be a species of conservation concern but is protected under the federal *Migratory Birds Convention Act*. A bull Moose was also observed in the wetland southeast of the main gate on June 25.

During the transect surveys on June 26 a Grey Wolf (*Canis lupus*) was observed walking west towards the Site main gate. The wolf turned around when it saw the field crew and truck.

## 5. CONCLUSIONS AND RECOMMENDATIONS

Based on the information reviewed and data collected for this report, bats are not anticipated to occur at the Clinton Creek Site. However, bats are believed to occur within 10 km of the Site and the overall northern range of the Little Brown Myotis does overlap with the Site (IUCN 2019).

In addition, birds were observed nesting within concrete foundations in the Mill area and in a concrete foundation within the waste rock area.

Based on the results of this study, ELR recommends that:

1. Mine infrastructure (e.g., concrete foundations, abandoned heavy equipment) should be removed or remediated outside of the bat summer roosting period and bird nesting periods (mid-April to the end of September) or visual checks of mine infrastructure by a qualified person should be completed before the infrastructure is removed or remediated. The checks will include looking for evidence of bats or birds within the infrastructure (e.g., bat movement or droppings, nests, and nest building or feeding activity by adult birds). If bats or birds are believed to be present then the qualified person can work with Site managers to develop appropriate work exclusion areas around the infrastructure until the bats leave the site for the season or until bird nestlings have fledged.

## 6. CLOSURE

Ecological Logistics & Research Ltd. prepared this bat survey report for the Government of Yukon, Assessment and Abandoned Mines Branch. This report summarizes the efforts and results of bat surveys conducted in 2019. We trust this report meets the needs of the Government of Yukon, but please do not hesitate to contact the undersigned should you require further information or clarification.

Sincerely,



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## PERSONAL COMMUNICATION

Mike Sutor, North Yukon Regional Biologist, Government of Yukon. June 25, 2019. By email.



## PHOTOGRAPHS



**Photo 1:** View of the static bat detector (BAT#1) installed in the wetland southeast of the main gate to the mine site. Photo taken on June 25, 2019



**Photo 2:** View of the static bat detector (BAT#2) installed in the mill area. Photo taken on June 25, 2019



**Photo 3:** View of a concrete foundation in the mill area, which could potentially provide roosting habitat for bats. Photo taken on June 25, 2019.



**Photo 4:** View of a corner of a concrete foundation in the mill area. It's believed that the cracks in the concrete have the potential to provide roosting habitat for bats although no evidence of bat use of these structures was observed. Photo taken on June 25, 2019.



**Photo 5:** View of the inside one of the concrete foundations in the mill area. It's believed that parts of the structure have the potential to provide roosting habitat for bats (arrows) although no evidence of bat use of the structure was observed. Photo taken on June 25, 2019.



**Photo 6:** View of a concrete foundation in the mill area. The arrow indicates the approximate location of a Say's Phoebe nest. Photo taken on June 25, 2019.



**Photo 7:** View of a Say's Phoebe nest within one of the concrete foundations in the mill area. Photo taken on June 25, 2019.



**Photo 8:** View of a concrete foundation at the edge of the waste rock. No evidence was found that bats were using the structure but it is believed that birds (Say's Phoebe) were nesting within the structure. Photo taken on June 25, 2019.

