

# Mineral and Crystal Occurrence Survey

of Mineral Claim

SO 1500016 (Lots 9-11, Concession 22 and Lot 11, Concession 21)),

(Also known as the Mumford Claim),

Cardiff Township, Ontario

By

Bradley S Wilson  
Kingston, Ontario

For

Ontario's Highlands Tourism Organization  
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March, 2012

**Mineral and Crystal Occurrence Survey**  
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## **Introduction**

For decades, recreational mineral collectors from around the world have been coming to south eastern Ontario to pursue their fascinating hobby by searching out mineral specimens from the many available collecting sites for which the region is famous. For this reason, many consider the region, often referred to in general as the Bancroft area, the "Mineral Capital of Canada".

A wide variety of minerals are known from hundreds of different occurrences throughout the region. Sadly, over the years, many of these localities have been closed to mineral collectors due in part to park and cottage development and a host of other land access issues. It has been suggested that fewer mineral collectors are coming to the region now than in the past. If this is true it may be in part, because there are fewer collecting sites available to the collector. The county of Haliburton and the Municipality of Highlands East, with the assistance of the Ontario's Highlands Tourism Organization, has acquired a number of mineral claims to explore the possibility of developing these claims as new recreational mineral collecting destinations, thereby providing incentive for mineral collectors to return and stay in the region.

The Mumford claim, located 5 km from the town of Wilberforce, is one of the claims held by the Municipality of Highlands East and the County of Haliburton is the subject of this report. Superb mineral specimens of apatite, urananite, amphibole, feldspar and titanite from localities in the Wilberforce area are well known among mineral collectors. The Schickler Occurrence (Sabina 1986) is a poorly known mineral collecting site that lies within the Mumford claim. Locating and assessing this site for its potential as a destination for the recreational mineral collector was one of the goals of this study. Many well known mineral collecting sites are located on privately owned land within several kilometres of the Mumford claim. It seemed reasonable to postulate that additional mineral collecting sites might be found here with a little focused effort. Identifying previously unknown sites suitable for the recreational collector was the other goal of this study. The author spent 2 1/2 days in the summer and fall of 2011 gathering data and identifying potential mineral collecting sites on the Mumford claim.

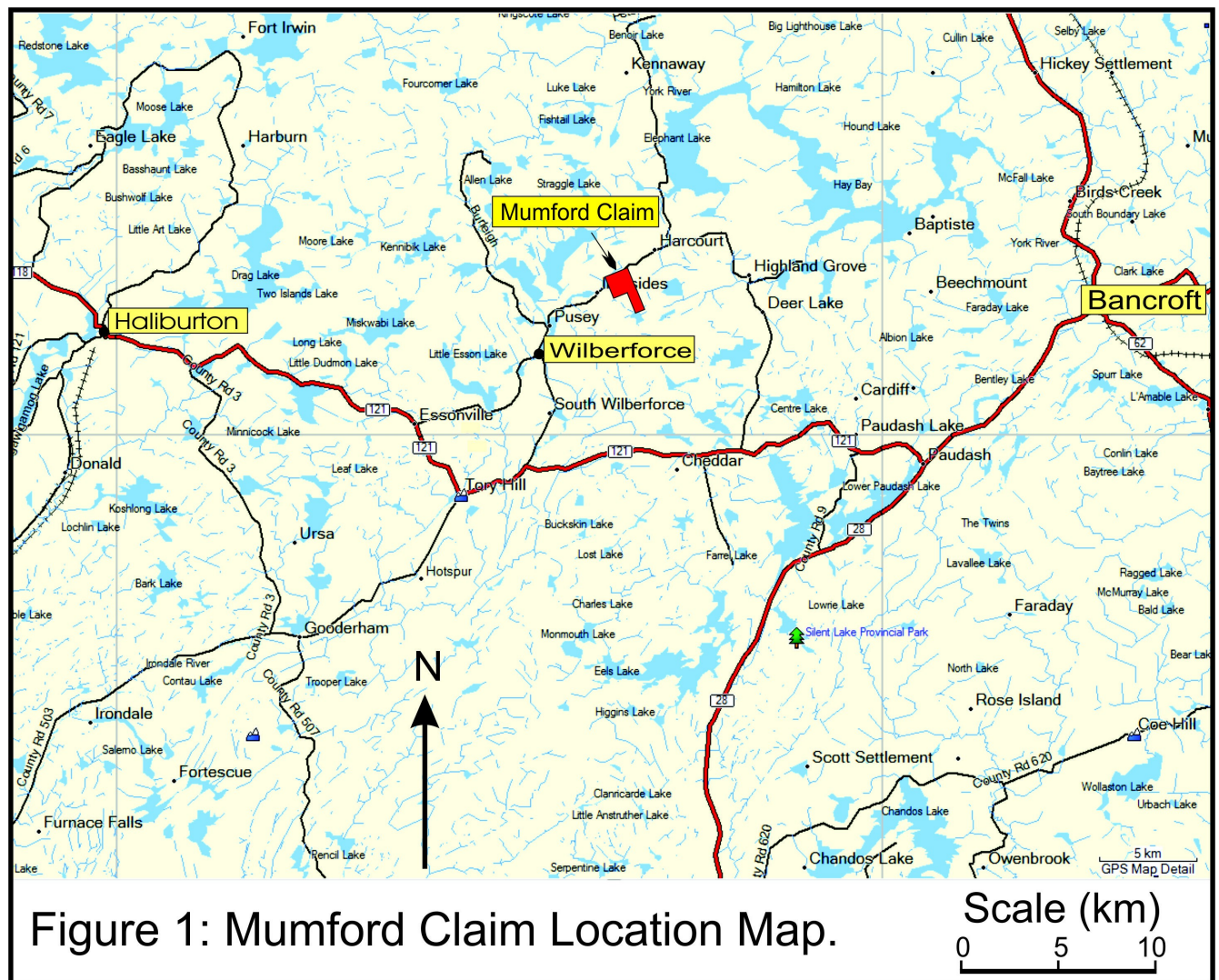
## **Claim Information**

The Mumford claim was staked on June 3, 2011 and its claim number is SO 1500016. Its ownership is currently shared equally by the Corporation of the Municipality of Highlands East and the Corporation of the County of Haliburton. The Mumford claim covers four concession lots in Cardiff Township, consists of eight claim units and carries a \$3200 annual exploration work commitment.

## **Location and Access**

The Mumford claim measures approximately 1.2 by 2.3 kilometres in size and occupies Lots 9-11, Concession 22 and Lot 11, Concession 21 in the township of Cardiff. It is located approximately 27 kilometres east from Haliburton and 25 km west from Bancroft, the two largest towns in the region (Figure 1).

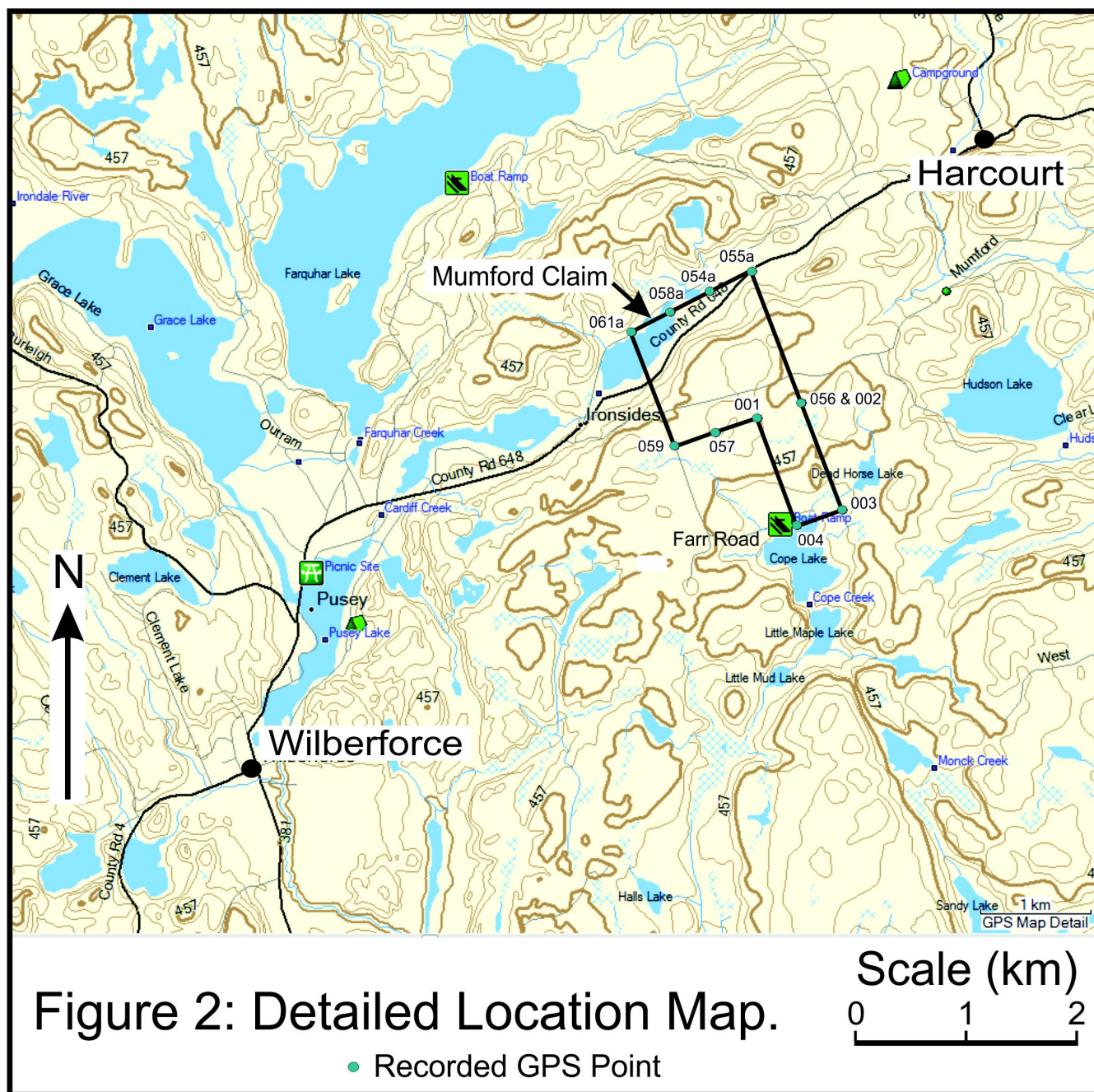
The Mumford claim is approximately 5 kilometres northwest of Wilberforce and 3 kilometres southeast of Harcourt, the two easiest communities from which to access the claim (Figure 2). The claim is located on NTS map 31E/01. To access the claim from Wilberforce, travel along County Road 648 until Mumford road is reached (approximately 4.7 kilometres). Turn right onto Mumford Road and travel 1.0 kilometres. At this point, the western boundary of Mumford claim is reached and Cope Lake Road branches off to the south.



Although the Mumford claim is surrounded by privately owned land, it is crossed by numerous roads and trails, making access very easy. Along the northern edge of the claim is paved County Road 648. The gravel covered Mumford Road traverses, in an east west direction, the central part of the claim. A narrow gravel road, called Manhire Road, leads to cottages on Cope Lake and provides access to the southern part of the claim. Several trails, used by ATVs in the summer and snowmobiles in the winter, traverse the claim and mineral collectors using these trails should be aware of the possibility of ATV traffic. Located near the centre of the claim is an active land fill site (garbage dump). Located on the northeastern corner of the claim is the abandoned Harcourt Graphite Mine. This old mine was not investigated as a potential collecting site during this study.

### Previous Work

The Mumford claim is underlain by rocks of the Grenville Province of the Canadian Shield. On a regional level Grenville Province rocks have been extensively studied and prospected for various ores over the last century. Authors, too numerous to mention, have studied and described these rocks.



A township wide geological report was published in 1959 by Hewitt that included a detailed geologic map covering both Cardiff and neighbouring Faraday Townships. Hewitt's study concentrated on the geology and economic mineral deposits of Cardiff and Faraday Townships and not on occurrences of crystals and minerals suitable for the recreational mineral collector. Hewitt (1959) briefly describes both the Schickler Occurrence and the National Graphite Property and lists but does not describe a uranium occurrence (D. E. Denfield), all of which lie on the Mumford claim.

Satterly (1957) reports that *circa* 1954, during exploration for radioactive minerals, stripping and trenching was conducted over claims that included Lot 11, Concession 21 (what is now the southern part of the Mumford claim), and that in 1955, a short (43 feet) hole was drilled on the same lot.

A detailed work covering an area around Cope Lake by Ennis (1968) documents geologic and radiometric surveys over a number of claims including what is now the southern part of the Mumford claim. Ennis was searching for radioactive minerals and not potential mineral collecting sites.

Guides to mineral collecting sites in southern Ontario have been published by various authors. One of the more recent guides covering the area is by Sabina (1986). Sabina (1986) describes mineral collecting sites throughout the Bancroft region, including those in the Wilberforce and Harcourt areas.

Two mineral collecting localities that Sabina (1986) describes, lie within the boundaries of the Mumford claim, the Schickler fluorite occurrence and the Harcourt Graphite Mine. In addition, Sabina (1986) describes four collecting localities within a few kilometres of the claim. These are the Clark Mine, Dwyer fluorite Mine, Trip (Nu-Age) Mine and the Richardson (Fission) Mine.

## **Fieldwork and Terminology**

For ease of reference, the mineral claim covering Lots 9-11, Concession 22 and Lot 11 Concession 21 in the township of Cardiff (SO 1500019) is being referred to in this report as the "Mumford claim". The author spent 2 1/2 days exploring and gathering data on the Mumford claim on the following dates; August 17, 28 (1/2), October 22, 2011. An additional 2 days were spent preparing field maps and writing this report.

Location points were recorded in the field as UTM coordinates using a hand-held GPS device and were numbered sequentially. The UTM coordinates are listed in Appendix I and are shown on Figures 4, 5 and 7. In addition to UTM points, Figure 4 shows the paths traversed by the author.

Assumptions have been made and a number of terms used by the author in preparing this report. Some of these require clarification. The minerals found on the Mumford claim and those named in this report were identified using standard field identification practices (observations of lustre, hardness, cleavage, crystal form, etc). No analytical work was performed to verify these identifications. Amphiboles belong to a complex group of minerals whose individual mineral species are difficult, if not impossible, to identify without detailed analytical work. For ease of reporting, the author has used the general term amphibole instead of going through the expense and time of having each sample analysed.

## **Property Geology**

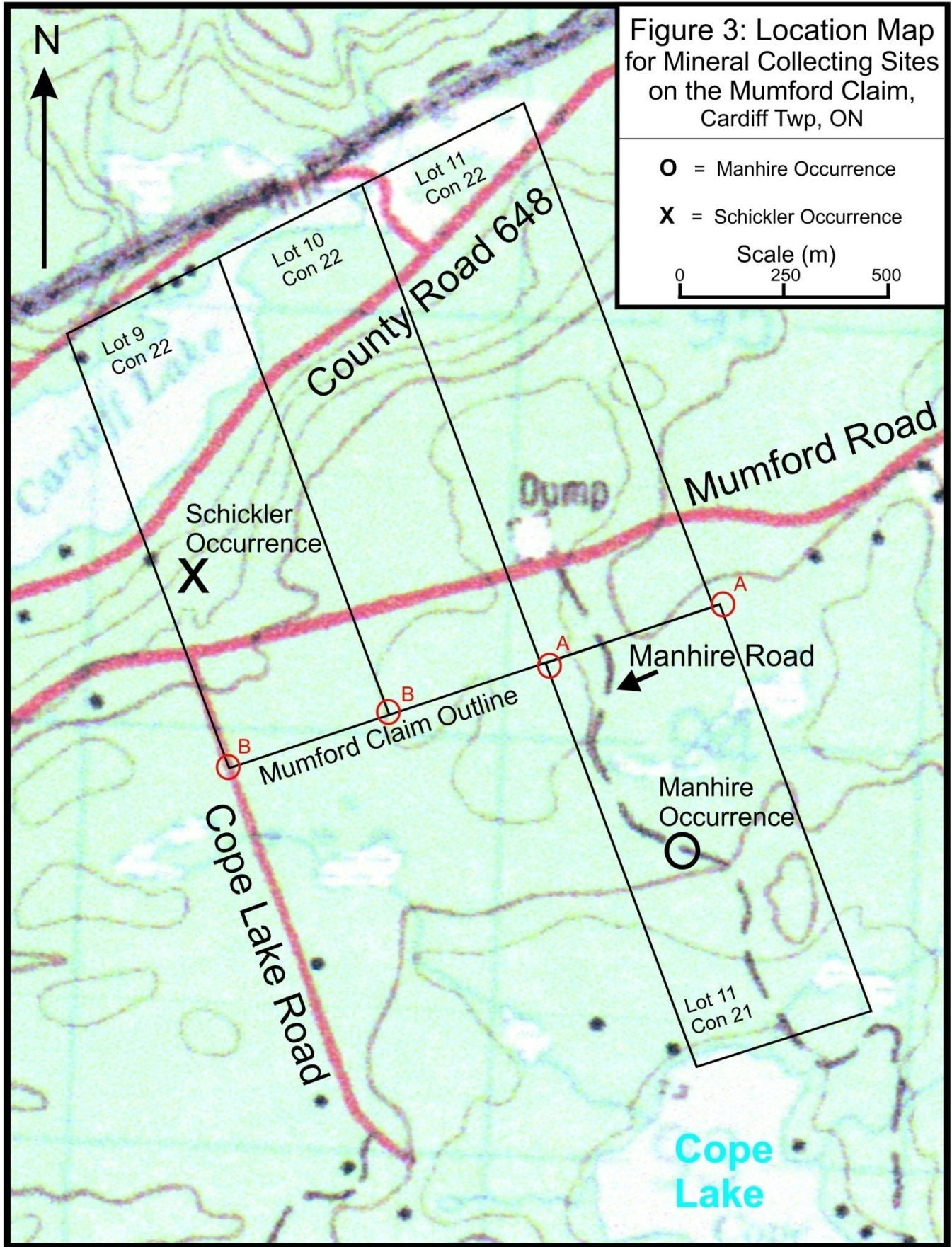
The Mumford claim is underlain by high-grade metamorphic rocks of the Grenville Province of the Canadian Shield. Rocks of the Grenville Province are well known and have been described by many authors. These rocks host virtually all the known mineral and crystal occurrences that attract mineral collectors, both professional and recreational, to the Bancroft area.

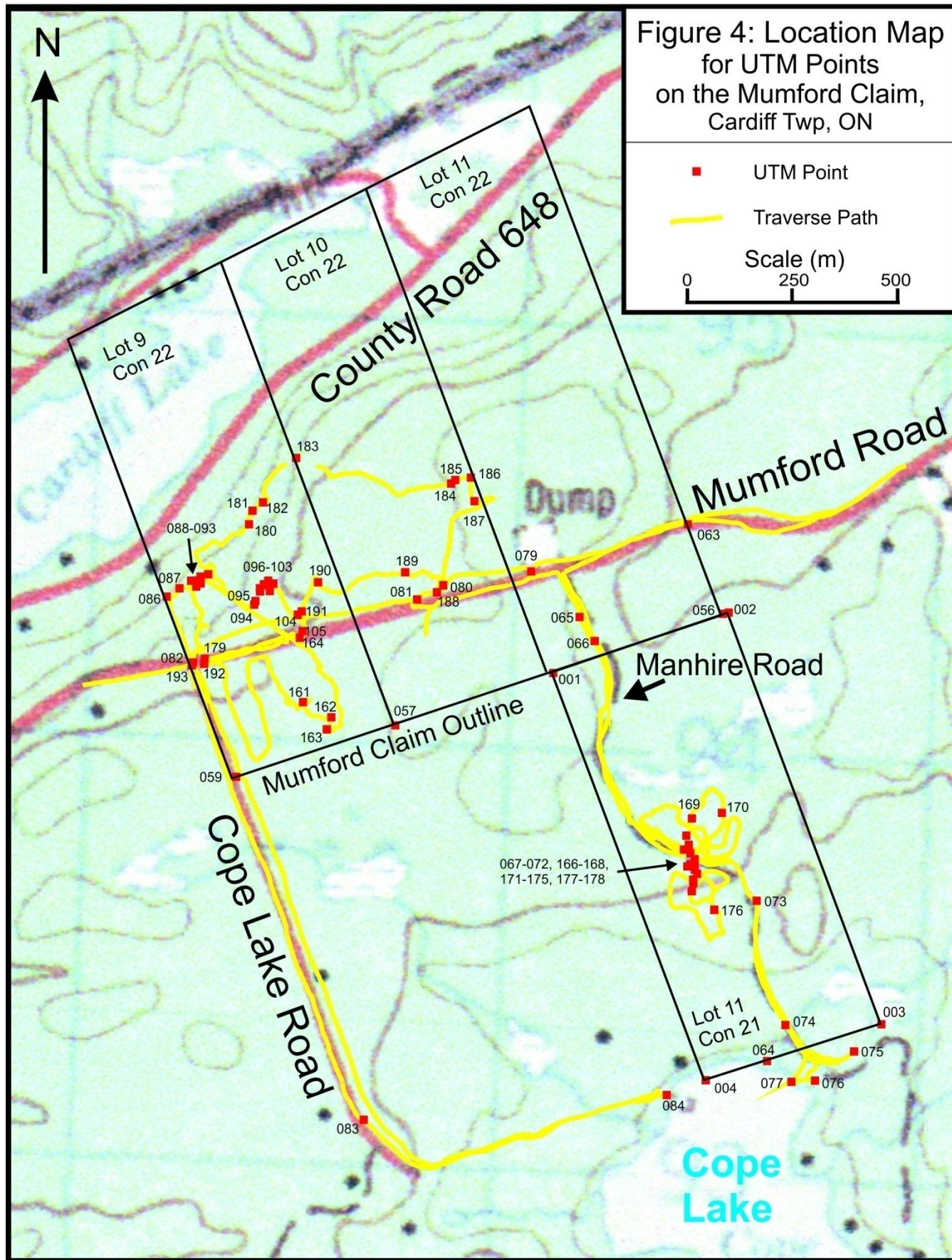
Although general geology was noted at most outcrops visited during this field project, due to time constraints and the project's focus on finding potential mineral collecting sites, not enough information was gathered to construct an accurate detailed geology map of the property.

The two crystal-bearing sites identified during this field study appear to be calcite dikes, or "Vein-Dikes" as described by Joyce (2006) (Figure 3).

## **Potential Mineral Collecting Sites**

The overall purpose of this study was to identify sites on the Mumford claim where minerals and/or crystals suitable for the recreational mineral collector could be found. The Schickler occurrence was already known prior to this study, but its exact location and mineral potential was not. In addition to locating and evaluating the Schickler occurrence, several other potential mineral collecting sites were identified (Figure 3).





### ***Schickler Fluorite Occurrence***

The Schickler Fluorite Occurrence has been described by Sabina (1986) as a calcite vein with granular fluorite that cuts hornblende granite where crystals of apatite, feldspar, pyroxene, scapolite and amphibole occur in white calcite. Sabina (1986) reports that development at the Schickler occurrence consists of a trench 33 metres long, 2 metres wide and 2 to 3 metres deep.

The author was able to locate the Schickler Occurrence (Figure 3, 5, and 6) and can confirm the general statements of Sabina (1986), including the approximate size of the trench. Using a GPS unit the author determined the length of the trench to be 42 metres. The trench is located in a wooded area and can offer a tranquil mineral collecting experience with the feel of being remote even though its location is less than 200 metres from the well-traveled County Road 648 and Mumford Road. Surrounding parts of the trench are mine dumps consisting of mostly overgrown waste rock from the trench which was excavated decades ago. These piles can provide abundant loose material for collectors to search through. Some of the dumps on the east end of the trench have been uncovered, presumably by mineral collectors, and minerals are quite visible. The author found granular fluorite in abundance on these dumps both as loose grains and as calcite-fluorite aggregates. Although not as abundant as fluorite, prismatic crystal sections of apatite and crude crystals of feldspar were also found loose on the dumps. It is quite possible that a persistent collector may be able to uncover samples containing complete crystals of apatite or feldspar by digging in these dumps. On the walls of the deepest portion of the trench is a zone with euhedral apatite, feldspar and amphibole crystals embedded in course-grained calcite. In addition to these minerals, it's conceivable that both titanite and/or zircon could be found in this type of deposit. This site is ideal for the beginner-level collector and holds high potential for the advanced mineral collector as well.

### ***Manhire Occurrence***

The author located a series of nine old trenches in the vicinity of Manhire Road about 750 metres south of Mumford Road (Figure 7). This is the same general area where Ennis (1968) conducted a scintillometer survey in 1968. Ennis (1968) also reported some work had been done on a mica occurrence on the site prior to 1953. The trenches found by the author are likely from work conducted during this era.

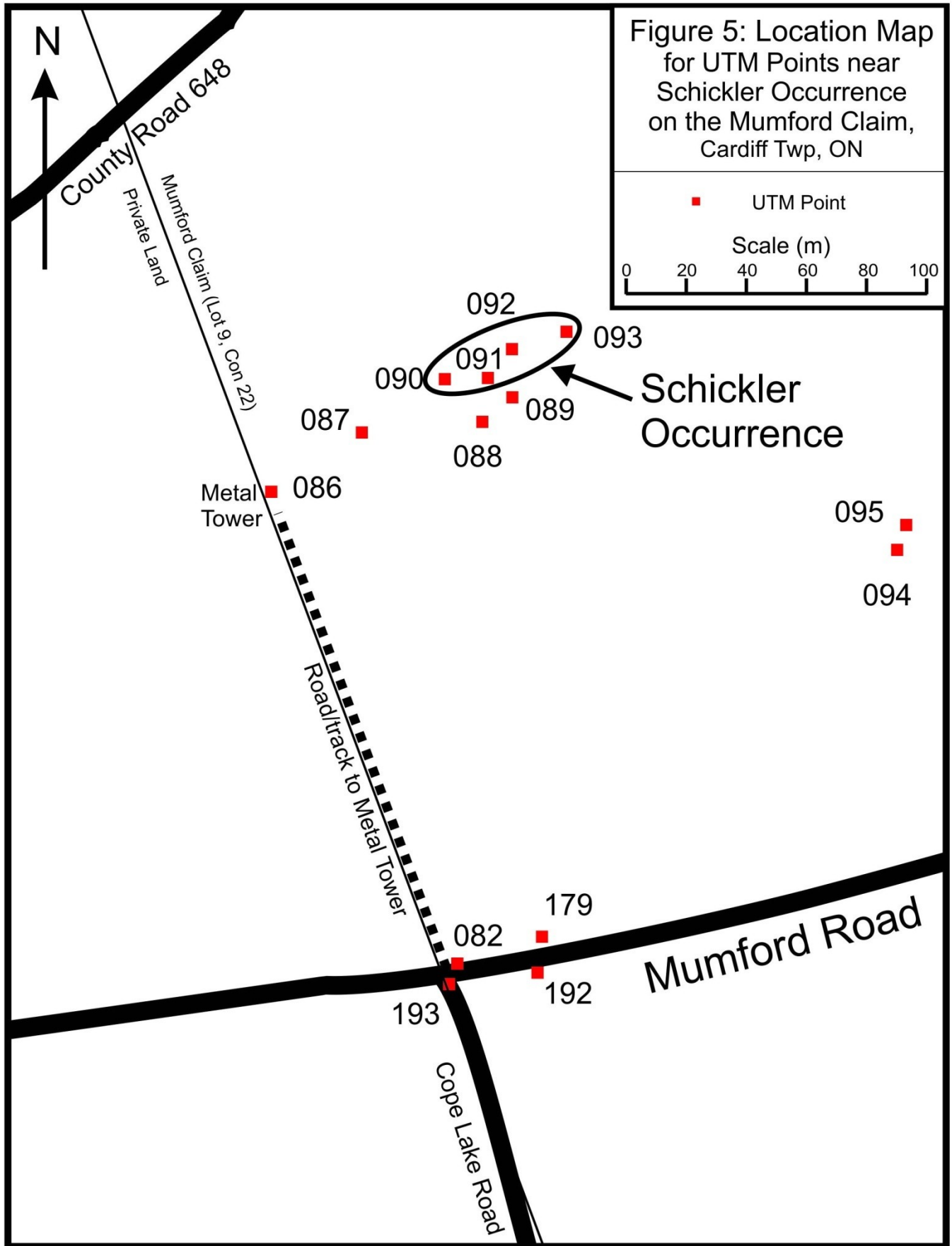
Nine trenches were mapped out (Figure 8), only two of which hold much potential for mineral collectors. The two trenches closest to the road, marked "1" and "2", in Figure 8 are the deepest of the nine and both expose bedrock along their walls. Material found loose on the waste dumps include, crystal fragments of black amphibole, mica, apatite, pyroxene and possibly scapolite. Trench "1" exposes several areas of bedrock where calcite with crystals of mica (to 10 cm), apatite (to 15 x 6 cm), pyroxene and amphibole (5-10 cm) occur. In August the trench was dry at the bottom but in October it had partially filled with water. The author etched with acid, a large sample containing abundant calcite. When the calcite had etched away, exposed on the sample were several terminated apatite crystals 1.5 x 8 centimetres in size! This is a perfect spot for the recreational mineral collector, beginner or advanced.

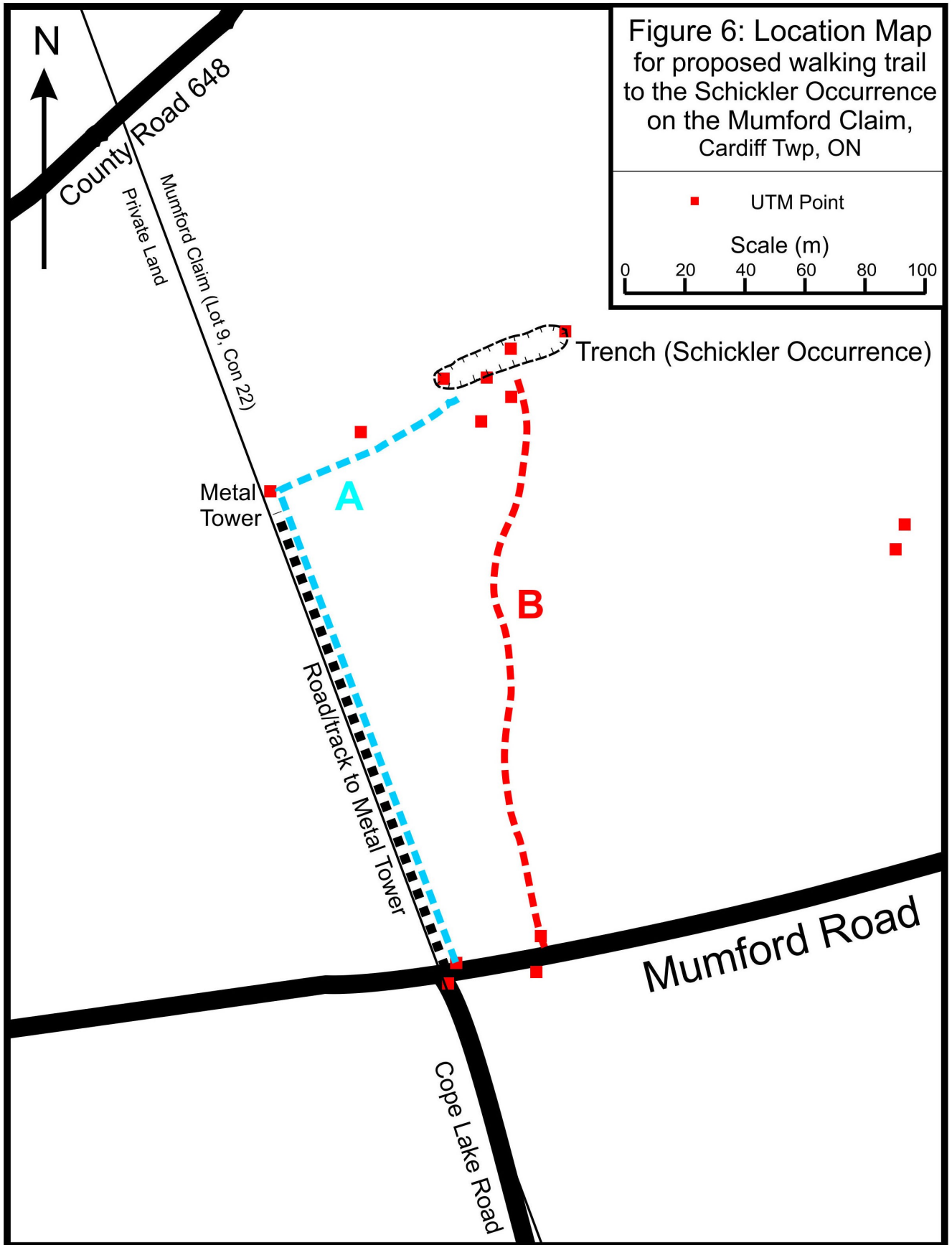
Trench "2" is mostly overgrown, but broken crystals of amphibole and mica were found in boulders clearly derived from the pit. This is another site with excellent potential of the mineral collector.

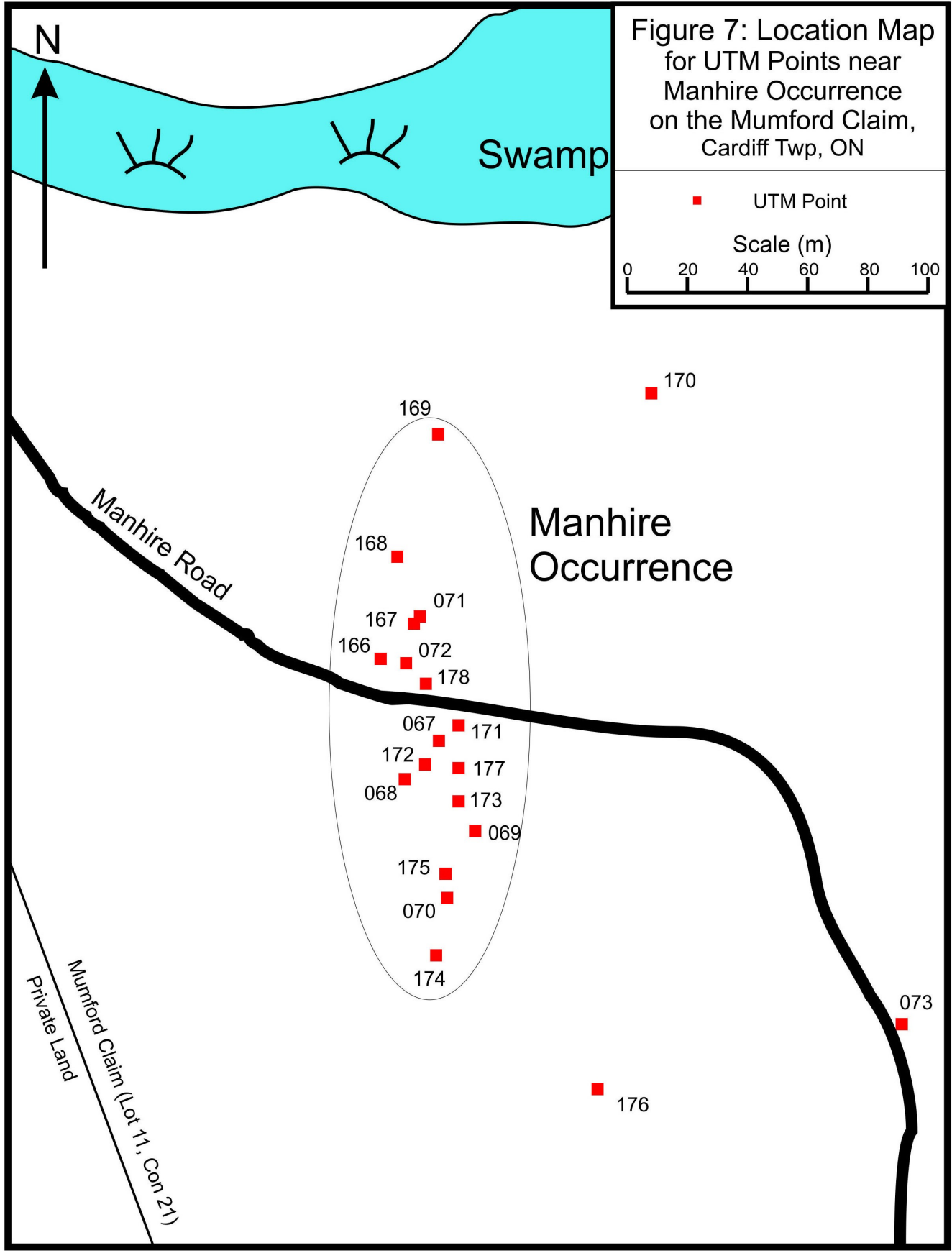
### **Map Information**

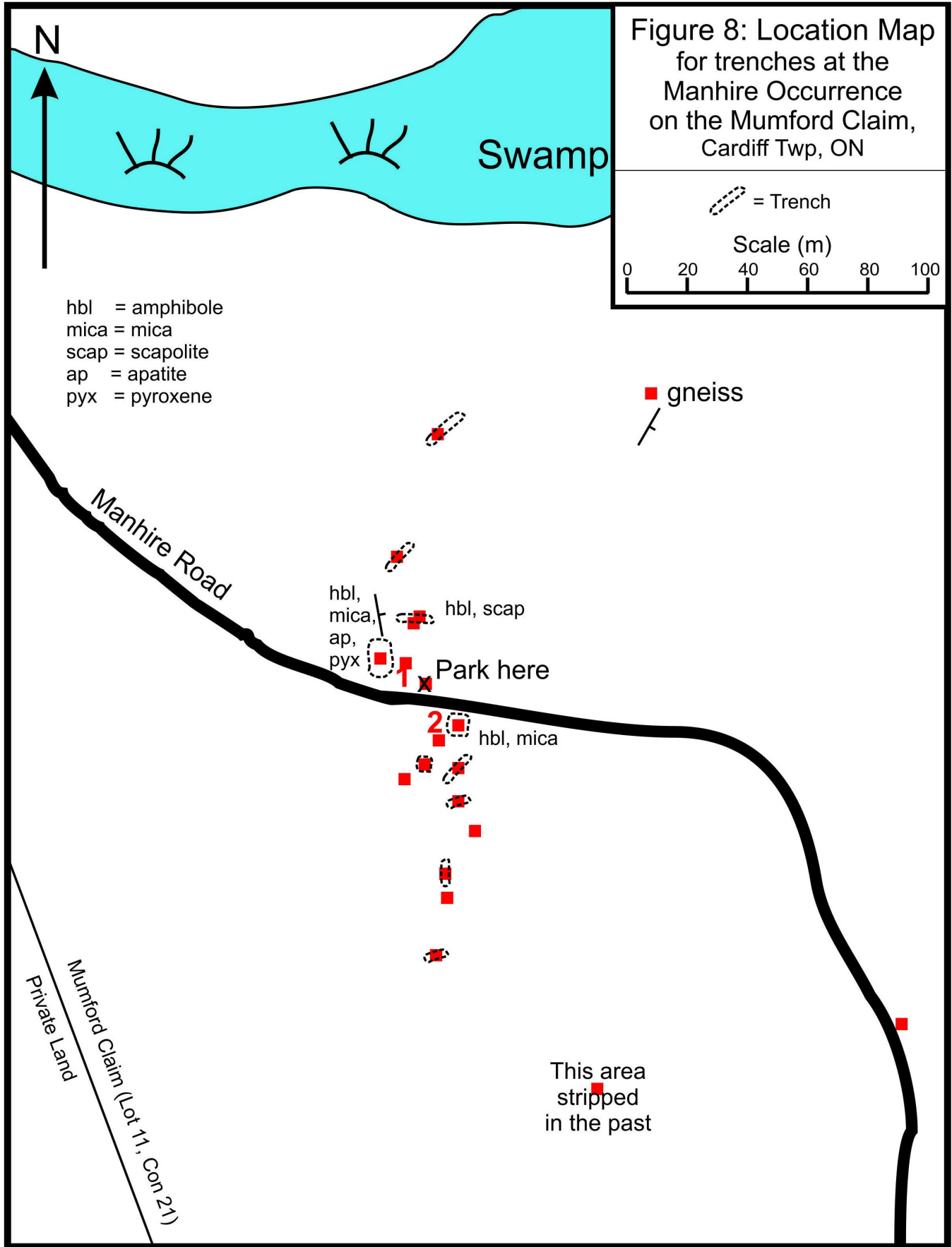
The topographic features shown on NTS map 31E/01 and those of the corresponding maps that come with the author's Garmin GPS unit appear to be shifted by 50 to 70 metres with respect to the UTM coordinates provided by the hand-held GPS unit. Claim maps downloaded from the government of Ontario's website appear to be correct with respect to topography and UTM coordinates. This creates a potential problem for tying in collecting sites with the claim boundaries. This problem was solved in the short term by shifting all the coordinate data by 60 metres to the northwest. Solving this discrepancy is the motive behind several of the author's recommendations.











## Summary and Recommendations

Two sites were identified on the Mumford claim during field work in 2011 where minerals suitable for mineral collectors were found. One site was previously known and called the Schickler Occurrence; the other site, called the Manhire Occurrence, was previously unknown. Both sites are relatively easy to access.

The amount of follow up work on this claim is going to depend on budget and degree of commitment to develop this claim for mineral collectors. The author will present two sets of recommendations. The first set of recommendations is based on a limited budget and the desire to provide collectors an opportunity to visit these sites mostly "as is". The second set of recommendations assumes a larger budget and should provide the mineral collector with an enhanced experience.

### ***Recommendations Based on a Limited Budget***

**1/** Physically locate on the ground the corners of the lots and then as accurately as possible mark them with a GPS unit. This is necessary to accurately tie the claim boundaries to both the collecting sites and the topographic features of the area. The Lot-corners should have been marked with short metal posts by surveyors when Cardiff Township was first established and surveyed. Theoretically only one Lot-corner needs to be found, but it would be best to locate a number of these Lot-corners. The most important Lot-corners to find are the NE and NW corners of Lot 11, Concession 21 (marked "A" on Figure 3) and the SE and SW corners of Lot 9, Concession 22 (marked "B" on Figure 3).

For ease and practicality I would recommend trying to locate all the southern Lot-corners of Lots 9-11, Concession 22 and the northern Lot-corners of Lot 11, Concession 21. These all fall on one roughly east-north-easterly line. The easiest place to start would be where Manhire Road intersects this line. The author noted an old cut line at approximately the correct location along Manhire Road (Appendix I).

**2/** Cut a walking trail to the Schickler Occurrence for mineral collectors to follow. There are two possible routes for this trail depending on the outcome of locating the Lot-corners as per Recommendation 1.

The easiest place to start this trail would be on the existing road/track that runs northward from Mumford Road at its junction with Cope Lake Road (Figure 5). This road/track goes downhill to a partial clearing and a metal tower. From here, construct the trail in an eastward direction to the Schickler Occurrence. This route has been marked on Figure 6 as Route "A". This road/track may, however, be located on private property. Accurately locating the Lot-corners with a GPS unit and tying in those data with the GPS locations of the road/track should help determine if this road/track is on the claim or not. If the road/track is on the claim then build the trail as described.

The most likely scenario is that the road/track is either on the claim boundary or off the claim entirely. One possible scenario would be to seek permission of the neighbouring landowner to allow mineral collectors to use the road/track to get to the start of the trail (near the metal tower). In the author's opinion a better course of action would be to construct the trail from Mumford Road, as marked on Figure 6 at Route "B". This would avoid any potential problems with surrounding landowners in the future. The best place to start this north trending walking trail would be on Mumford Road at point "179" (see Appendix I), located about 30 metres east of the junction of Cope Lake Road and Mumford Road.

**3/** Prepare a map and short printed guide directing potential mineral collectors to two sites on the Mumford claim; the Schickler Occurrence and the Manhire Occurrence.

### **Recommendations Based on a Larger Budget**

**1/** Survey the access to the Schickler Occurrence to determine the location of the road/track leading to the metal tower in relation to the claim boundary and survey Manhire Road as far as the Manhire Occurrence to insure that this road and its right-of-way are on public land or the claim.

**2/** Cut a walking trail to the Schickler Occurrence for mineral collectors to follow. There are two possible routes for this trail depending on the outcome of the survey as per Recommendation 1.

The easiest place to start this trail would be on the existing road/track that runs northward from Mumford Road at its junction with Cope Lake Road. This road/track goes downhill to a partial clearing and a metal tower. From here, construct the trail in an eastward direction to the Schickler Occurrence. This road/track may, however, be located on private property. Accurately locating the Lot-corners with a GPS unit and tying in those data with the GPS locations of the road/track should help determine if the road/track is on the claim or not. If the road/track is on the claim then build the trail as described.

The mostly likely scenario is that the road/Track is either on the claim boundary or possibly even off the claim entirely. One possible scenario would be to seek permission of the neighbouring landowner to allow mineral collectors to use the road/track to get to the start of the trail (near the metal tower). In the author's opinion a better course of action would be to construct the trail from Mumford Road. This would avoid any potential problems with surrounding landowners in the future. The best place to start this north trending walking trail would be on Mumford Road about 30 metres east of the junction of Cope Lake Road and Mumford Road.

**3/** Hire a backhoe to expose bedrock in the trenches at both the Schickler and Manhire Occurrences. To get the backhoe to the Schickler Occurrence, follow whichever route is planned for the walking trail. The proposed route for the trail, either starting in the clearing next to the metal tower or starting on Mumford Road at point "179", should be flat enough that the backhoe should need little more than a few trees cleared out of the way to be "walked" to the trench with ease. The backhoe should clear out the main trench, exposing bedrock in the bottom and along the walls of the trench. The backhoe should also turn over some of the old rock dumps surrounding the trench to expose new material for collectors to examine.

The trenches at the Manhire Occurrence are located on either side of and adjacent to Manhire Road (Figure 8) and should not present a problem for the backhoe to access. The backhoe should clear away debris from the sides and bottom of the two trenches closest to each side of the road, marked "1" and "2" on Figure 8. The other trenches are smaller and need only be exposed at the discretion of the supervisor of this phase of development.

**4/** Prepare a map and short printed guide directing potential mineral collectors to two sites on the Mumford claim; the Schickler Occurrence and the Manhire Occurrence.

**5/** Consider another study, such as this one, to investigate the potential of the Harcourt Graphite Mine as a destination for mineral collectors.

## References

Ennis, G. F., 1968: *Ontario Assessment Report 31E01SE0060 63.2418*

Hewitt, D. F., 1959: Geology of Cardiff and Faraday Townships; *Ontario Department of Mines, Annual Report, V. 66, pt. 3, 1957.*

Joyce, D.K., 2006: Calcite Vein-Dikes of the Grenville Geological Province, Ontario, Canada; *Rocks & Minerals, Vol 81, p 34-42*

Satterly, J., 1957: Radioactive mineral occurrences in the Bancroft area, Ontario; *Ontario Department of Mines, Annual Report, v. 65, pt. 6.*

Sabina, Ann P., 1986: Rocks and Minerals for the Collector: Bancroft - Parry Sound Area and Southern Ontario; *Geological Survey of Canada Miscellaneous Report 39, 182 p.*

## Appendix I; List of UTM coordinates used on and near the Mumford claim

Point #	Description of Point	UTM Coordinate <i>(Zone, Easting, Northing)</i>	Elevation
001	Claim corner	17 T 723164 4994137	
002	Claim corner	17 T 723572 4994293	
003	Claim corner	17 T 723970 4993336	
004	Claim corner	17 T 723558 4993186	
054a	Claim corner	17 T 722695 4995268	
055a	Claim corner	17 T 723066 4995469	
056	Claim corner	17 T 723558 4994289	
057	Claim corner	17 T 722792 4994000	
058a	Claim corner	17 T 722346 4995071	
059	Claim corner	17 T 722420 4993864	
060	start of trail/track to metal tower	17 T 722310 4994129	
061a	Claim corner	17 T 721996 4994878	
062	southern claim line and shore of Cope Lake	17 T 723699 4993238	
063	point on Mumford Road	17 T 723470 4994499	
64	County Road 648 and Mumford Road	17 T 721396 4993827	400 m
65	point of Cope Lake Road	17 T 723221 4994270	478 m
66	point of Cope Lake Road	17 T 723259 4994216	482 m
67	old trenches - Manhire Road area	17 T 723508 4993704	478 m
68	old trenches - Manhire Road area	17 T 723498 4993693	476 m
69	old trenches - Manhire Road area	17 T 723520 4993674	472 m
70	old trenches - Manhire Road area	17 T 723510 4993653	470 m
71	old trenches - Manhire Road area	17 T 723499 4993742	472 m
72	old trenches - Manhire Road area	17 T 723496 4993727	472 m
73	small creek and Manhire Road	17 T 723662 4993617	461 m
74	small creek and Manhire Road	17 T 723741 4993325	425 m
75	Manhire road	17 T 723905 4993269	458 m
76	edge of Cope Lake	17 T 723816 4993197	436 m
77	point of outcrop on Cope Lake	17 T 723759 4993191	433 m
78	Mumford Road and Hudson Lake Road	17 T 724838 4995343	401 m
79	Dump entrance	17 T 723102 4994374	513 m
80	ATV Trail crossing Mumford Road	17 T 722895 4994334	519 m
81	Clearing on Airphoto	17 T 722836 4994298	512 m
82	Cope Lake Road and Mumford Road	17 T 722308 4994130	501 m
83	Trail crossing Cope Lake Road	17 T 722751 4993067	471 m
84	Cope Lake Boat Launch	17 T 723467 4993150	425 m
85	County Road 648 and Mumford Road	17 T 721401 4993838	403 m
86	Metal Tower	17 T 722241 4994283	435 m
87	o/c granite gneiss w fluorite	17 T 722272 4994304	444 m
88	o/c granite gneiss w fluorite	17 T 722312 4994311	441 m
89	o/c with small trench	17 T 722322 4994319	441 m
90	west end of Schickler trench	17 T 722299 4994324	441 m
91	Schickler Trench	17 T 722313 4994324	446 m
92	Schickler Trench	17 T 722321 4994334	446 m



Point #	Description of Point	UTM Coordinate	Elevation
		<i>(Zone, Easting, Northing)</i>	
93	eastern end of Schickler Trench	17 T 722338 4994340	447 m
94	possible subcrop - syenite boulders	17 T 722451 4994274	453 m
95	o/c ridge syneite or qtz-syenite	17 T 722453 4994280	460 m
96	o/c ridge syneite or qtz-syenite	17 T 722461 4994304	461 m
97	granite	17 T 722461 4994310	466 m
98	granite	17 T 722471 4994321	465 m
99	boulders of syenite with fluorite	17 T 722480 4994327	467 m
100	subcrop-boulders? Granite-syenite w fluorite & hbl	17 T 722483 4994327	466 m
101	o/c possible trench granite-syenite w fluor & hbl	17 T 722484 4994318	469 m
102	o/c ridge, granite-syenite with fluorite	17 T 722485 4994307	467 m
103	o/c ridge, granite-syenite with fluorite	17 T 722493 4994324	466 m
104	o/c edge of large ridge foliated syenite gneiss	17 T 722553 4994253	471 m
105	road	17 T 722566 4994214	481 m
161	o/c Kspar-qtz-bio gneiss	17 T 722572 4994048	455 m
162	o/c banded pink-grey gneiss	17 T 722640 4994014	451 m
163	o/c banded pink-grey gneiss	17 T 722631 4993986	453 m
164	o/c (road) hbl granite w minor fluorite & calcite	17 T 722560 4994200	466 m
166	trench - Manhire Occurrence area "1"	17 T 723485 4993729	467 m
167	trench - Manhire Occurrence area	17 T 723497 4993742	481 m
168	trench - Manhire Occurrence area	17 T 723491 4993763	481 m
169	trench - Manhire Occurrence area	17 T 723504 4993805	477 m
170	gneiss - foliation 030/25SE	17 T 723574 4993820	482 m
171	trench - Manhire Occurrence area "2"	17 T 723514 4993709	475 m
172	trench - Manhire Occurrence area	17 T 723504 4993696	472 m
173	trench - Manhire Occurrence area	17 T 723514 4993685	469 m
174	trench - Manhire Occurrence area	17 T 723507 4993633	469 m
175	trench - Manhire Occurrence area	17 T 723511 4993660	469 m
176	stripped area	17 T 723562 4993590	465 m
177	trench - Manhire Occurrence area	17 T 723513 4993696	475 m
178	parking area - Manhire Occurrence	17 T 723502 4993721	454 m
179	Start of walking trail to Schickler	17 T 722338 4994141	460 m
180	o/c - granite/syenite gniess	17 T 722430 4994463	449 m
181	o/c - ridge/escarp, hbl syenite gneiss w Flourite	17 T 722437 4994494	458 m
182	o/c same ridge	17 T 722463 4994514	454 m
183	o/c same ridge	17 T 722540 4994628	466 m
184	o/c massive fn-med grained hbl granite	17 T 722905 4994574	482 m
185	similar to 184 but foliated	17 T 722915 4994584	476 m
186	similar to 184 but foliated	17 T 722951 4994590	479 m
187	ATV trail	17 T 722962 4994534	473 m
188	ATV trail	17 T 722880 4994318	479 m
189	straight survey line - cut - trends 156	17 T 722804 4994361	481 m
190	o/c N side of hill foliated graniet gneiss	17 T 722599 4994330	478 m
191	same as 190	17 T 722564 4994260	478 m
192	Start of walking trail to Schickler	17 T 722335 4994129	449 m
193	Start of road/track to metal tower	17 T 722307 4994124	456 m

## **Appendix 2;**

### **Statement of Qualifications of the Author**

I, Bradley S. Wilson of P.O. Box 352, Kingston, Ontario, K7L 4W2, do hereby state that I:

- 1/ graduated from Queen's University in 1982 with an Honours B.Sc. degree in Geology.
- 2/ graduated from Carleton University in 1987 with a M.Sc. degree in Geology.
- 3/ received a degree in gemmology in 1991 from the Canadian Gemmological Association (F.C.Gm.A).
- 4/ worked as an independent consultant on over 20 coloured gemstone projects since 1991.
- 5/ worked for mineral exploration companies during parts of 23 of the last 33 years either as a consultant or as a seasonal employee.
- 6/ conducted gemstone exploration on my own behalf nearly continuously since 1982.
- 7/ have no interest, direct or indirect, in the Mumford claim (SO 1500016).
- 8/ performed the work described in this report.

Bradley S. Wilson

March 13, 2012