



REPORT

**GEOLOGICAL ASSESSMENT IN SUPPORT OF
PROPOSED NIAGARA ESCARPMENT PLAN RE-
DESIGNATION**

CHELTENHAM QUARRY - 14504 MISSISSAUGA ROAD, CALEDON

Submitted to:

Brampton Brick Limited

Submitted by:

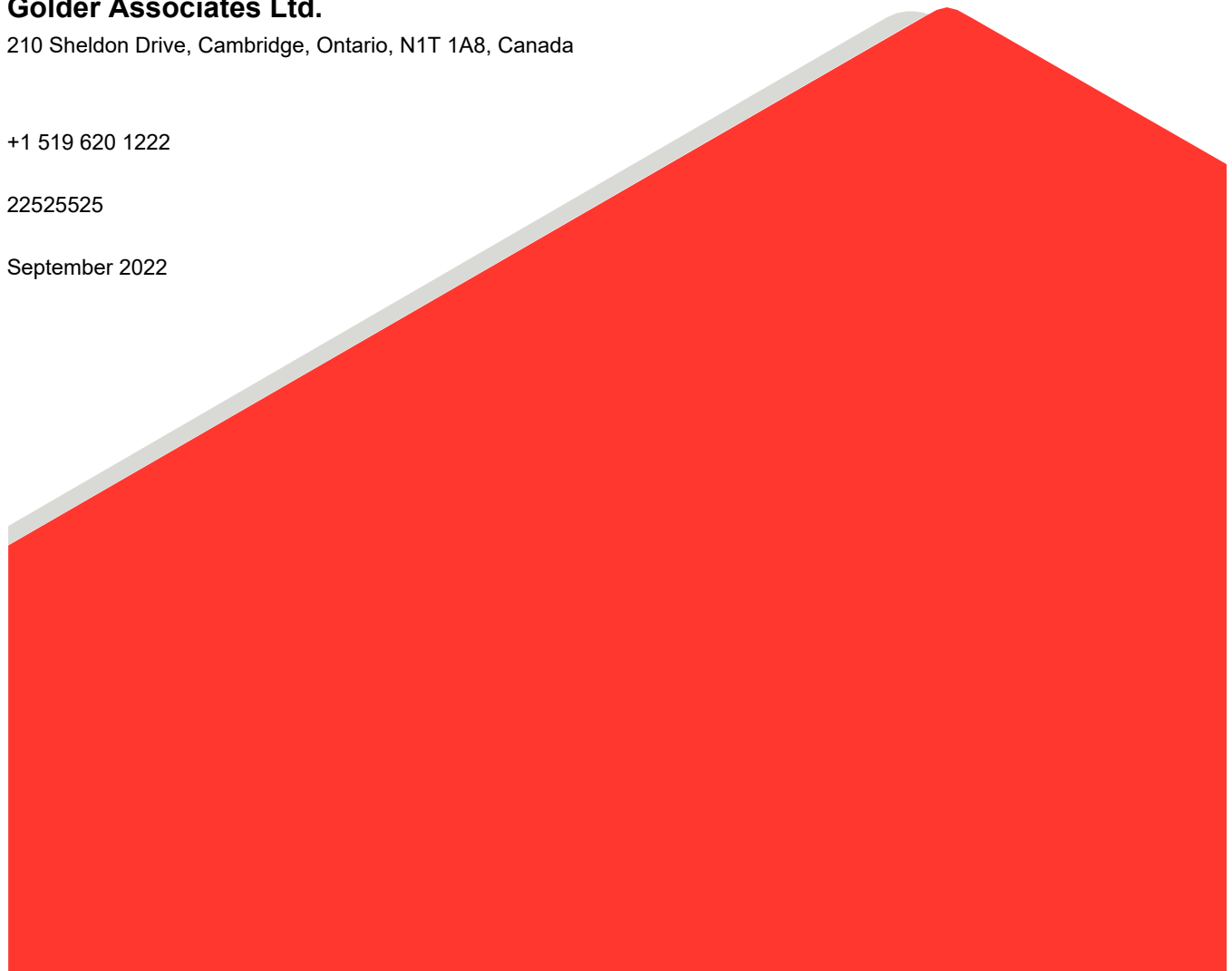
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22525525

September 2022



Distribution List

eCopy - Brampton Brick

eCopy - MHBC Planning

eCopy - WSP Golder

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N/A

1.0 INTRODUCTION

Golder Associates Ltd., a member of WSP (Golder) was retained by Brampton Brick to complete a geological assessment of a 14.68 hectare Brampton Brick owned land parcel (the site) situated immediately north of the existing Cheltenham Quarry located at 14504 Mississauga Road, Caledon, Ontario (Figure 1). The site is currently designated as 'Escarpment Protection Area' (MMAH 2017) under the Niagara Escarpment Plan (NEP) as shown on Figure 2.

Brampton Brick is seeking to submit an amendment to the Niagara Escarpment Commission to re-designate the site to 'Escarpment Rural Area' and will be submitting a planning justification report to address provisions outlined in Section 1.2.1 of the NEP (MHBC Planning 2022).

The purpose of the geological assessment presented in this report is to inform the planning justification report by assessing the geology of the site relative to the designation criteria for the Escarpment Protection Area and Escarpment Rural Area.

2.0 NEP LAND USE DESIGNATIONS

The lands within the Niagara Escarpment Plan area have been allocated the following seven land use designations (MMAH 2017):

- Escarpment Natural Area
- Escarpment Protection Area
- Escarpment Rural Area
- Minor Urban Centre
- Urban Area
- Escarpment Recreation Area
- Mineral Resource Extraction Area

From a geological perspective, the following are the relevant Niagara Escarpment Plan criteria that were assessed. The other criteria for designation are assessed in other technical reports.

The Escarpment Protection Area land use designation is based on the following geological criteria (MMAH 2017).

- Escarpment slopes and Escarpment Related Landforms where existing land uses have significantly altered the natural environment (e.g., agricultural lands or residential development).

The Escarpment Rural Area land use designation is based on the following criteria (MMAH 2017).

- Minor Escarpment slopes and Escarpment Related Landforms.

The Niagara Escarpment Plan defines these terms as follows:

Escarpment slope: The area between the brow and toe of the Escarpment and usually characterized by a steep gradient. Where the rise occurs in the form of a series of steps, the slope also includes the terraces between the steps.

Escarpment Related Landform: A physical feature of the land associated with the Escarpment and created by erosion, sedimentation and/or glaciation, often including such features as moraines, lakes, river valleys, beach ridges, drumlins and kames.

From a geological perspective, the key difference between the two designations is that an Escarpment Protection Area is comprised of Escarpment slopes that have been significantly altered by human activity (such as agriculture), whereas an Escarpment Rural Area is comprised of minor Escarpment slopes (which may or may not have been altered by human activity).

3.0 ASSESSMENT METHODOLOGY

Our assessment methodology was to review publicly available aerial imagery, geographic mapping and geological data for the site, and then conduct a site reconnaissance visit in order to make first hand observations of the geological conditions.

The data review was completed in June 2022 and included the compilation and review of the following data sets for the site and surrounding area:

- Recent aerial imagery (Figure 1);
- NEP land use mapping (Figure 2);
- Topography and drainage (Figure 3);
- Bedrock geology (Figure 4);
- Quaternary (surficial) geology (Figure 5); and
- Ground slope calculated from topography (Figure 6).

The site reconnaissance visit was completed on June 20, 2022 and consisted of a walkover of the site to assess geological conditions and terrain (i.e., slopes), documenting key observations via photographs (Figures 7 to 14).

4.0 ASSESSMENT RESULTS

The topography on the site (Figure 3) is flat or gently undulating (Figures 7 to 12), with a typical ground slope of less than 5 degrees (Figure 6) and a maximum observed slope of less than 10 degrees.

Although Quaternary (surficial) geology mapping for the site indicates it has been predominantly classified as Palaeozoic bedrock at surface (Figure 5 – Soil Type 3), no bedrock outcrop was observed during the site visit. The ground surface was observed to be predominantly covered by red-brown silty to clayey till (Figure 13) suggesting it would more appropriately be mapped as Type 5d – Glaciolacustrine-derived silty to clayey till, similar to the property immediately east of the site.

In general, the geologic and terrain conditions on the site were observed to be quite similar to that observed on the property immediately to the east of the site (Figure 14), which is designated as Escarpment Rural Area.

Based on this review of geological information and our site reconnaissance, it is our opinion that this property better fits the Escarpment Rural Area designation than it fits the Escarpment Protection Area designation from a geological perspective, primarily because the site is comprised of minor slopes, which better fits the Escarpment Rural Area geological criteria.

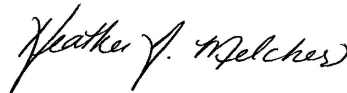
Signature Page

We trust that this report meets your current needs. Please contact the undersigned with any comments or questions.

Golder Associates Ltd.



George Schneider, M.Sc., P.Geo.
Senior Geoscientist



Heather Melcher, M.Sc.
Director, Ecology - Ontario Earth and Environment

GWS/HLM/

[https://golderassociates.sharepoint.com/sites/163188/project files/6 deliverables/geological report/03 revised report 01sep2022/22525525 rpt cheltenham geologic assessment 01sep2022.docx](https://golderassociates.sharepoint.com/sites/163188/project%20files/6%20deliverables/geological%20report/03%20revised%20report%2001sep2022/22525525%20rpt%20cheltenham%20geologic%20assessment%2001sep2022.docx)

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LEGEND

- ROAD
- WATERCOURSE
- WATERBODY
- PROPERTY BOUNDARY
- Area Subject to Potential Future Niagara Escarpment Plan Amendment



REFERENCE(S)
1. BASEDATA OBTAINED FROM THE MNRF LIO 2022
2. IMAGERY SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
BRAMPTON BRICK LIMITED

PROJECT
**GEOLOGICAL ASSESSMENT
CHELTENHAM QUARRY, BRAMPTON, ONTARIO**

TITLE
CHELTENHAM QUARRY AND ADJOINING LANDS

CONSULTANT	YYYY-MM-DD	2022-09-22
	DESIGNED	SO
	PREPARED	SO
	REVIEWED	GS
	APPROVED	

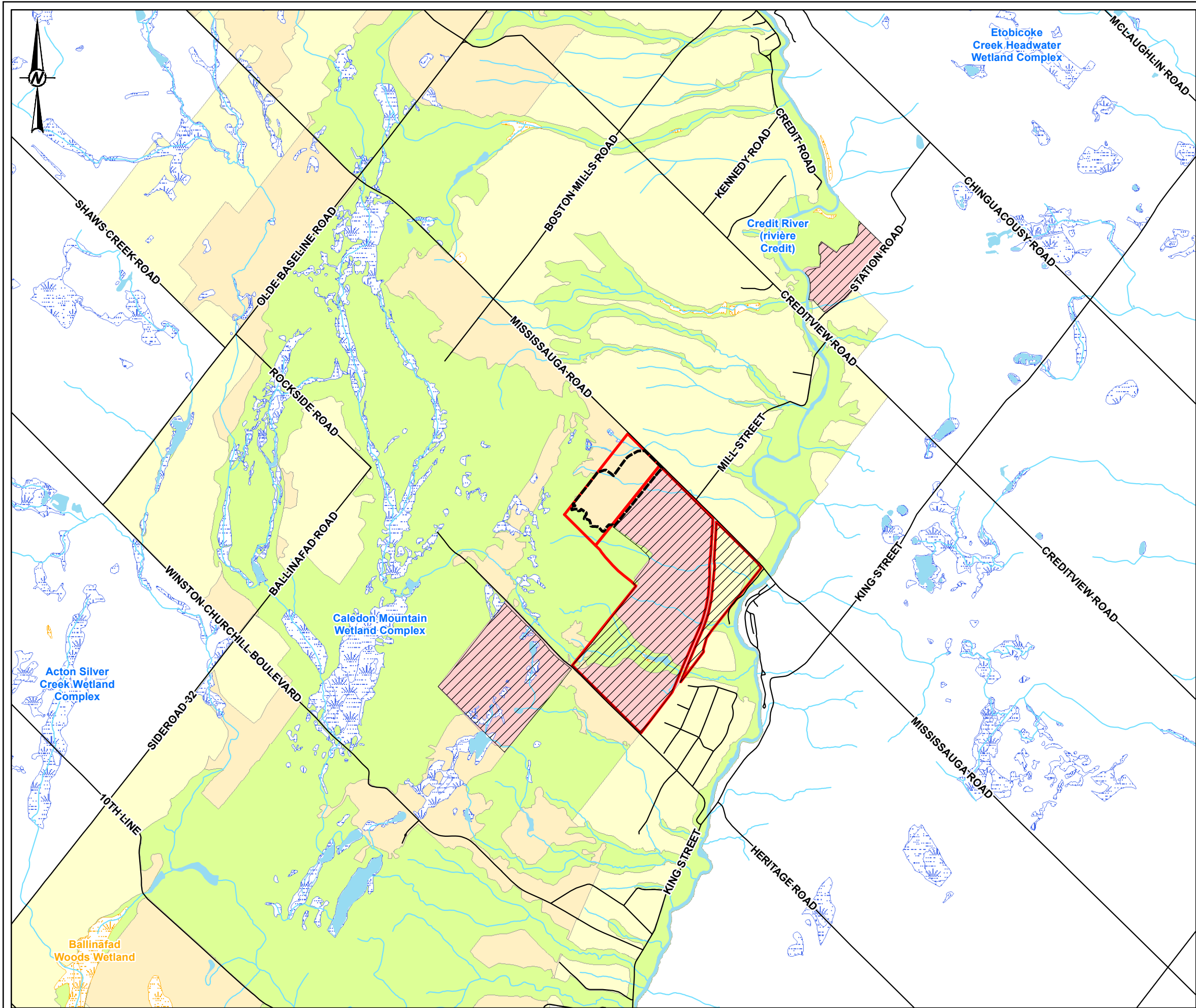


PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

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LEGEND

- ROAD
- WATERCOURSE
- WATERBODY
- WETLAND
- PROVINCIALY SIGNIFICANT WETLAND
- PROPERTY BOUNDARY
- Area Subject to Potential Future Niagara Escarpment Plan Amendment

NIAGARA ESCARPMENT PLAN DESIGNATION

- ESCARPMENT NATURAL AREA
- ESCARPMENT PROTECTION AREA
- ESCARPMENT RURAL AREA
- MINERAL RESOURCE EXTRACTION AREA

REFERENCE(S)

1. BASEDATA OBTAINED FROM THE MNRF LIO 2022
2. SURFICIAL GEOLOGY OF SOUTHERN ONTARIO, MINISTRY OF NORTHERN DEVELOPMENT, MINES AND FORESTRY, MRD128-REV.
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

BRAMPTON BRICK LIMITED

PROJECT

GEOLOGICAL ASSESSMENT
CHELTENHAM QUARRY, BRAMPTON, ONTARIO

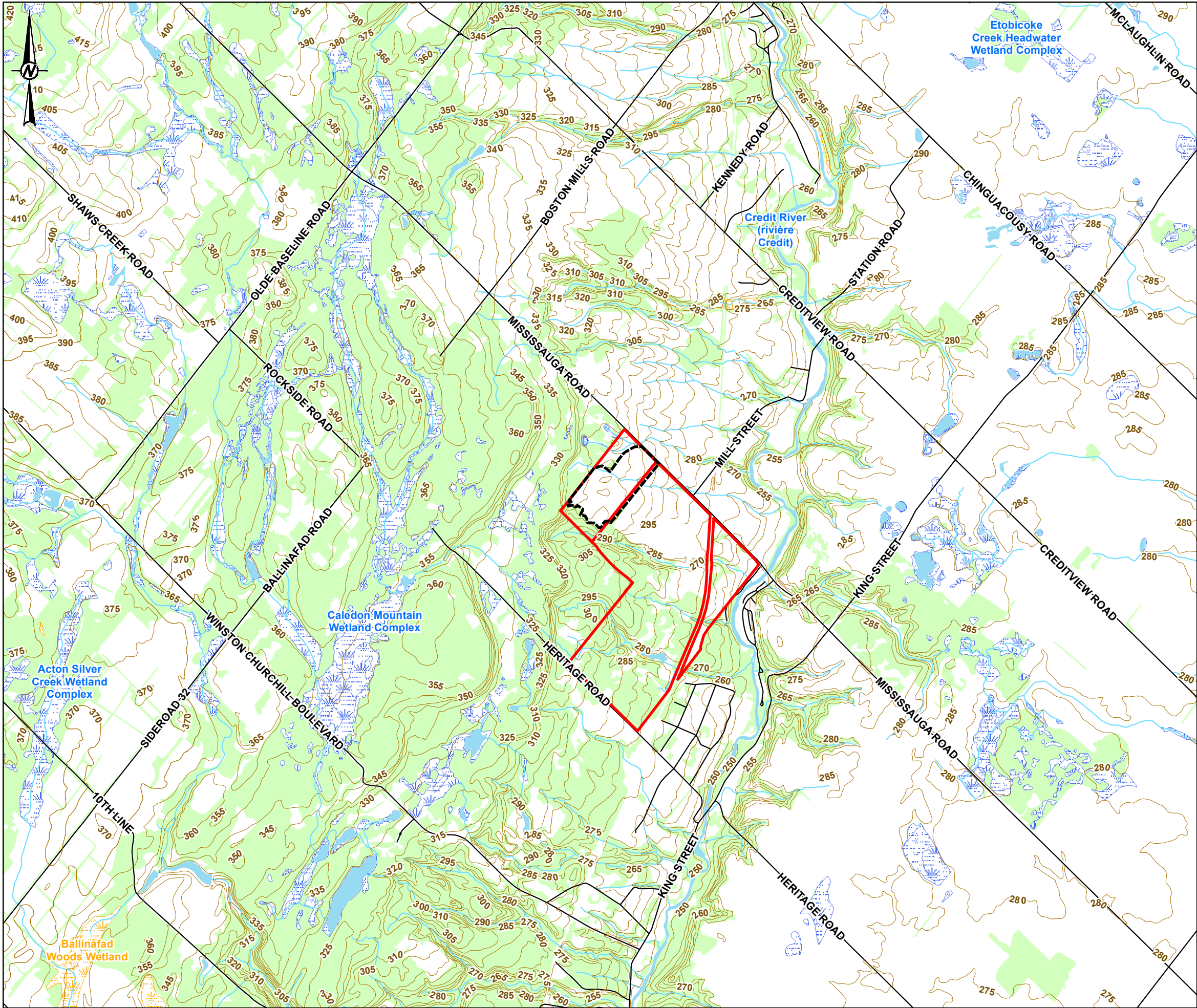
TITLE

NEC PLAN DESIGNATION

CONSULTANT	YYYY-MM-DD	2022-09-22
DESIGNED	SO	
PREPARED	SO	
REVIEWED	GS	
APPROVED		

PROJECT NO.	CONTROL	REV.	FIGURE
22525525	0001	0.0	2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
28mm



LEGEND

- ROAD
- CONTOUR (5m INTERVAL)
- WATERCOURSE
- WATERBODY
- WETLAND
- PROvincially SIGNIFICANT WETLAND
- WOODED AREA
- PROPERTY BOUNDARY
- AREA SUBJECT TO POTENTIAL FUTURE NIAGARA ESCARPMENT PLAN AMENDMENT

REFERENCE(S)

1. BASEDATA OBTAINED FROM THE MNRF LIO 2022
2. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

BRAMPTON BRICK LIMITED

PROJECT

GEOLOGICAL ASSESSMENT
CHELTENHAM QUARRY, BRAMPTON, ONTARIO

TITLE

TOPOGRAPHY AND DRAINAGE

CONSULTANT	YYYY-MM-DD	2022-09-22
DESIGNED	SO	
PREPARED	SO	
REVIEWED	GS	
APPROVED		

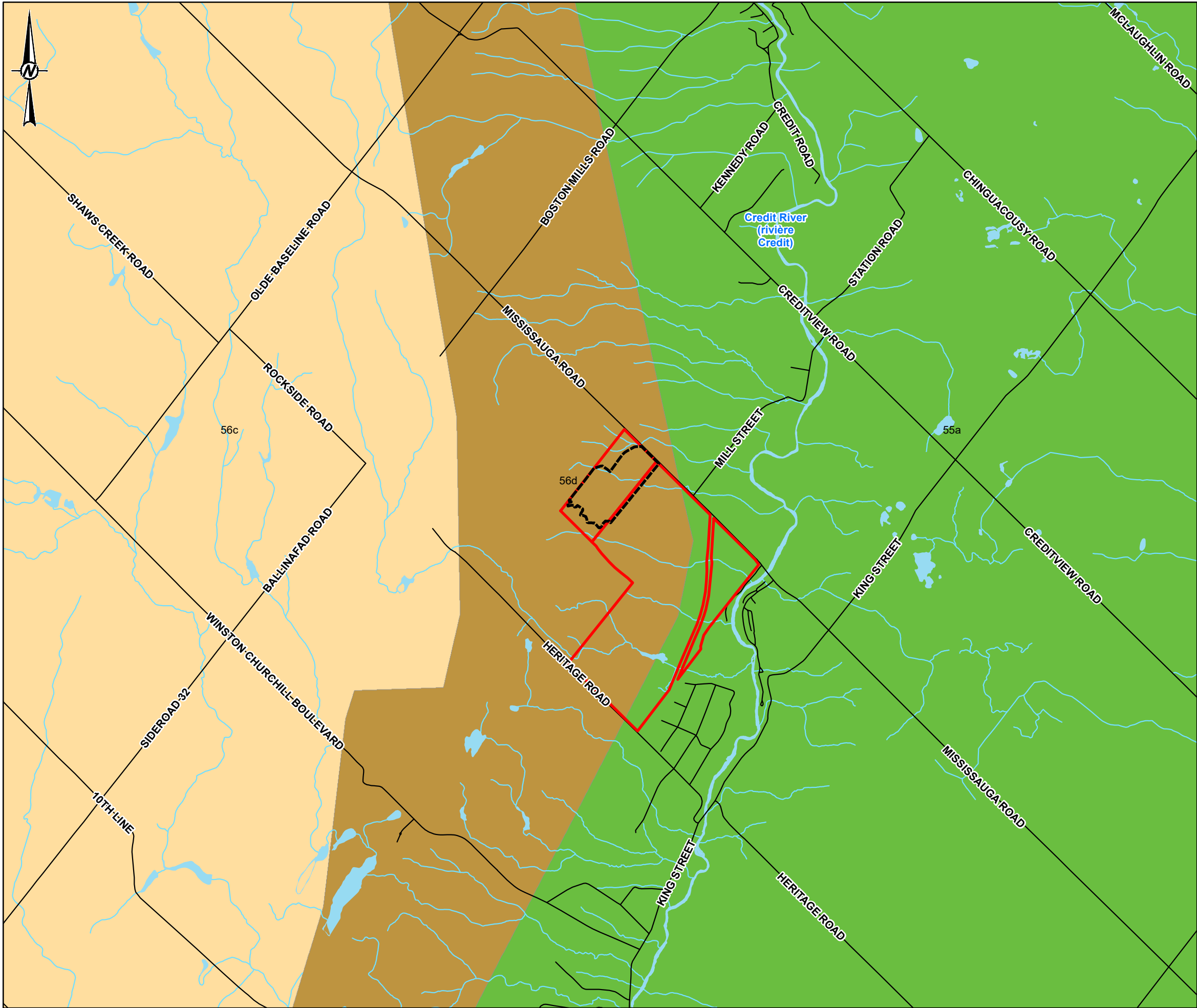
PROJECT NO. 22525525

CONTROL 0001

REV. 0.0

FIGURE 3

wsp GOLDER



LEGEND

ROAD

WATERCOURSE

WATERBODY

PROPERTY BOUNDARY

AREA SUBJECT TO POTENTIAL FUTURE NIAGARA ESCARPMENT PLAN AMENDMENT

BEDROCK GEOLOGY

QUEENSTON FM

55A: SHALE, LIMESTONE, DOLOSTONE, SILTSTONE

CLINTON CATARACT GROUP

56D: SANDSTONE, SHALE, DOLOSTONE, SILTSTONE

AMABEL FM

56C: SANDSTONE, SHALE, DOLOSTONE, SILTSTONE

0 500 1,000

1:25,000 METRES

REFERENCE(S)

1. BASEDATA OBTAINED FROM THE MNRF LIO 2022

2. BEDROCK GEOLOGY OF ONTARIO, MINISTRY OF NORTHERN DEVELOPMENT, MINES AND FORESTRY, MRD126-REV,

3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

BRAMPTON BRICK LIMITED

PROJECT

GEOLOGICAL ASSESSMENT

CHELTENHAM QUARRY, BRAMPTON, ONTARIO

TITLE

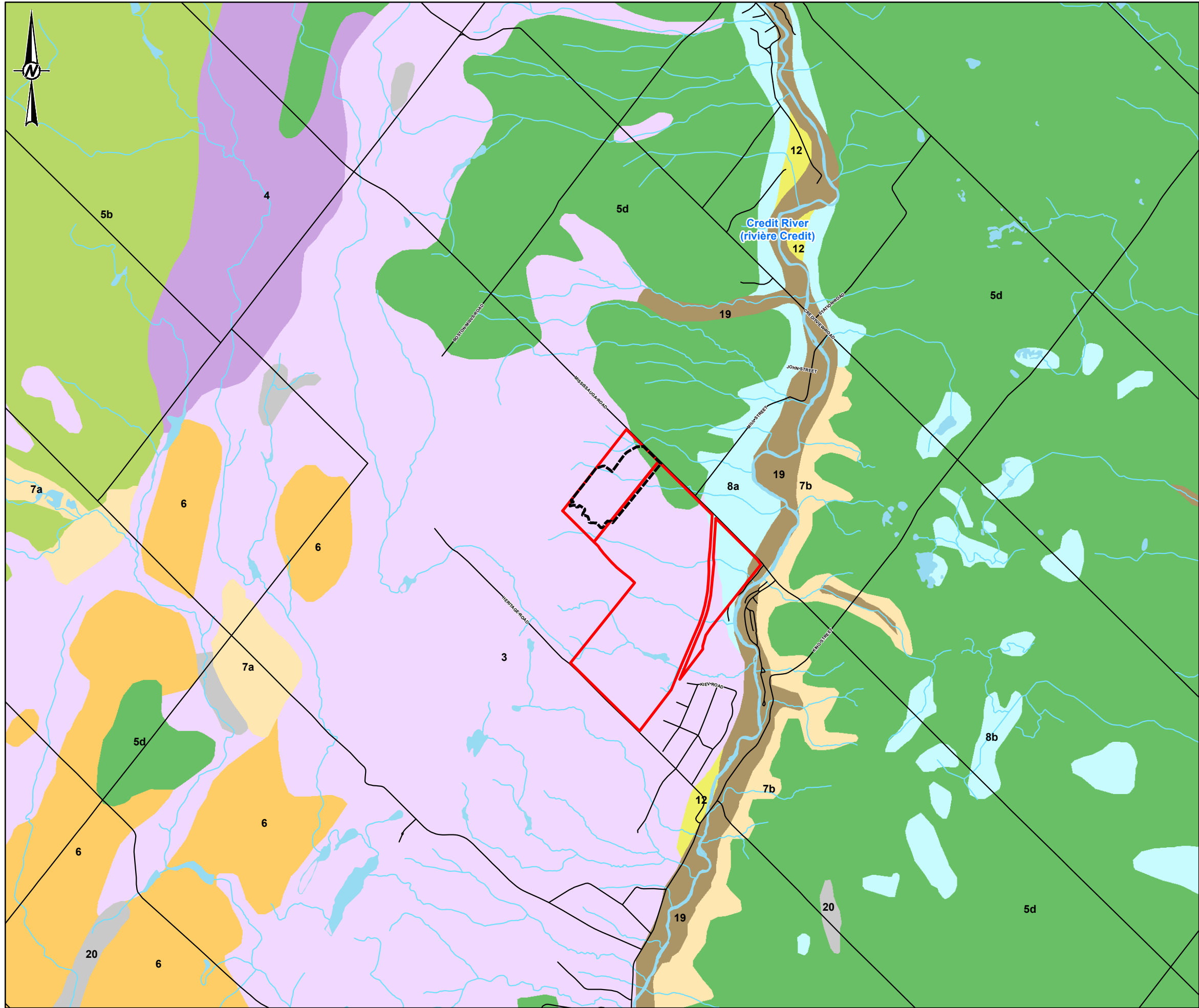
OGS MAPPED BEDROCK GEOLOGY

CONSULTANT	YYYY-MM-DD	2022-09-22
DESIGNED	SO	
PREPARED	SO	
REVIEWED	GS	
APPROVED		

wsp GOLDER

PROJECT NO.	CONTROL	REV.	FIGURE
22525525	0001	0.0	4

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LEGEND

- ROAD
- WATERCOURSE
- WATERBODY
- PROPERTY BOUNDARY
- AREA SUBJECT TO POTENTIAL FUTURE NIAGARA ESCARPMENT PLAN AMENDMENT

QUATERNARY GEOLOGY

- 3: PALEOZOIC BEDROCK
- 4: PALEOZOIC BEDROCK-DRIFT COMPLEX
- 5B: STONE-POOR, CARBONATE-DERIVED SILTY TO SANDY TILL
- 5D: GLACIOLACUSTRINE-DERIVED SILTY TO CLAYEY TILL
- 6: ICE-CONTACT STRATIFIED DEPOSITS
- 7A: SANDY DEPOSITS
- 7B: GRAVELLY DEPOSITS
- 8A: MASSIVE-WELL LAMINATED
- 8B: INTERBEDDED FLOW TILL, RAINOUT DEPOSITS AND SILT AND CLAY
- 12: OLDER ALLUVIAL DEPOSITS
- 19: MODERN ALLUVIAL DEPOSITS
- 20: ORGANIC DEPOSITS



REFERENCE(S)

1. BASEDATA OBTAINED FROM THE MNRF LIO 2022
2. SURFICIAL GEOLOGY OF SOUTHERN ONTARIO, MINISTRY OF NORTHERN DEVELOPMENT, MINES AND FORESTRY, MRD128-REV,
3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

BRAMPTON BRICK LIMITED

PROJECT

GEOLOGICAL ASSESSMENT
CHELTENHAM QUARRY, BRAMPTON, ONTARIO

TITLE

OGS MAPPED QUATERNARY GEOLOGY

CONSULTANT

wsp **GOLDER**

YYYY-MM-DD 2022-09-23

DESIGNED SO

PREPARED SO

REVIEWED GS

APPROVED

PROJECT NO.

22525525

CONTROL

0001

REV.

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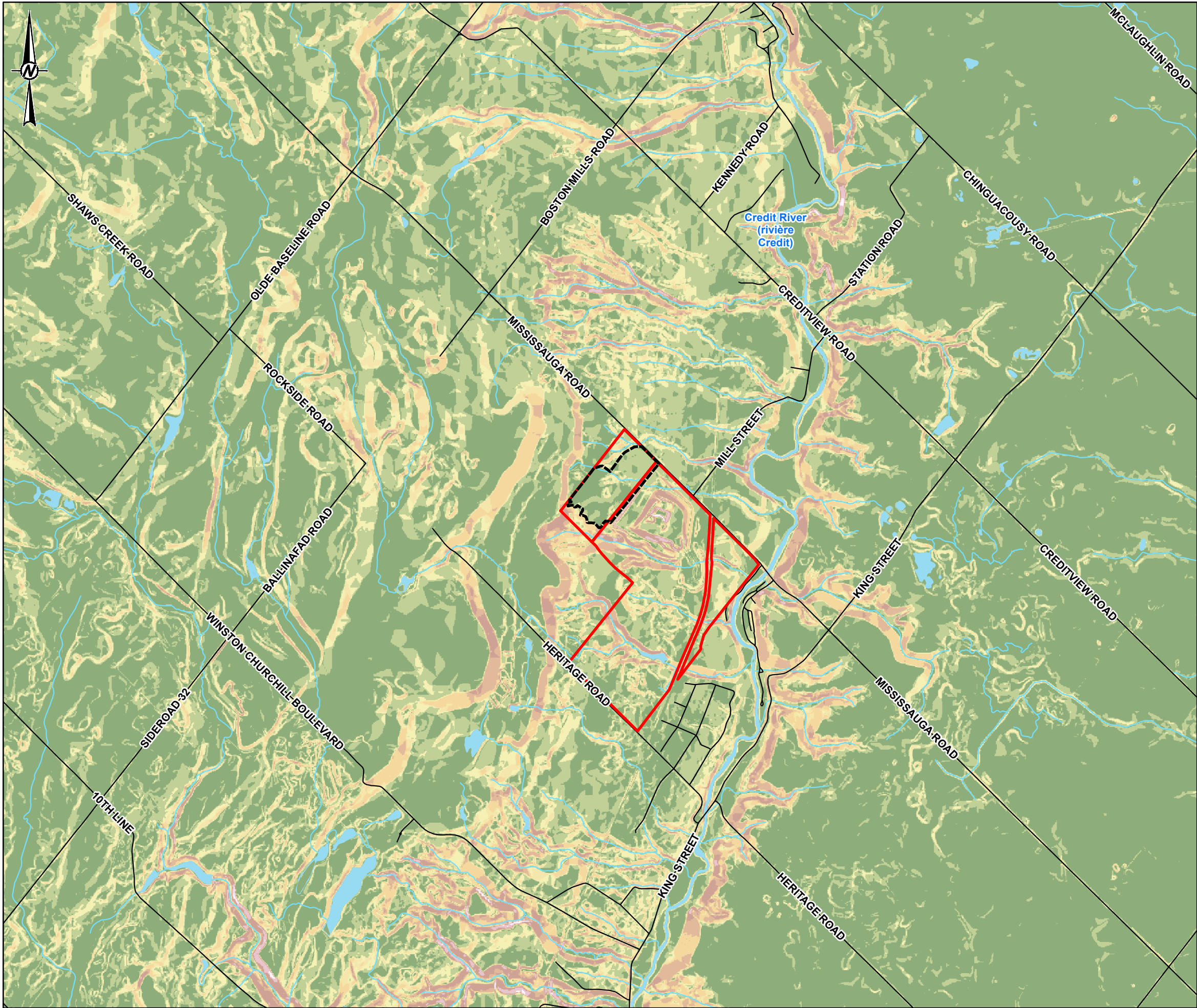
FIGURE

5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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- LEGEND
- ROAD
 - WATERCOURSE
 - WATERBODY
 - PROPERTY BOUNDARY
 - AREA SUBJECT TO POTENTIAL FUTURE NIAGARA ESCARPMENT PLAN AMENDMENT

- SLOPE (DEGREES)
- 0 - 2.5
 - 2.5 - 5
 - 5 - 7.5
 - 7.5 - 10
 - 10 - 15
 - 15 - 20
 - 20 - 30
 - 30 - 40
 - >40



- REFERENCE(S)
1. BASEDATA OBTAINED FROM THE MNRF LIO 2022
 2. SLOPE GENERATED USING THE GTA 2002 DIGITAL ELEVATION MODEL (5 M RESOLUTION), OBTAINED FROM THE MRNF LIO.
 3. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT
BRAMPTON BRICK LIMITED

PROJECT
GEOLOGICAL ASSESSMENT
CHELTENHAM QUARRY, BRAMPTON, ONTARIO

TITLE
GROUND SLOPE (DERIVED FROM TOPOGRAPHY)

CONSULTANT	YYYY-MM-DD	2022-09-22
	DESIGNED	SO
	PREPARED	SO
	REVIEWED	GS
	APPROVED	

wsp GOLDER

PROJECT NO.	CONTROL	REV.	FIGURE
22525525	0001	0.0	6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

28mm



Figure 7 – View from center of the site looking southwest – June 20, 2022



Figure 8 – View from center of the site looking northwest – June 20, 2022



Figure 9 – View from center of the site looking northeast – June 20, 2022



Figure 10 – View from center of the site looking southwest – June 20, 2022



Figure 11 – View from east of the site looking south – June 20, 2022



Figure 12 – View from east of the site looking west – June 20, 2022



Figure 13 – Typical clay soil exposure in north central part of the site – June 20, 2022



Figure 14 – View of neighbouring property immediately east of Mississauga Road – June 20, 2022



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