

September 25, 2023

GFX-1068

To: Martin & Lisa Lepke

Geotechnical and Geohazard Assessment for Existing Swimming Pool – **AMENDED in RED**
2636 Forsyth Drive, Penticton, BC

SUMMARY

Ground FX Geotechnical Inc. (GFX) was retained by Martin and Lisa Lepke, the owners of the property at 2636 Forsyth Drive, Penticton, to assess site conditions with respect to potential geotechnical and geohazard impacts of an existing swimming pool to the property as well as neighbouring downslope properties. See attached *Figure 1 – Location Plan* and *Figure 2 – Site Plan*.

Martin and Lisa Lepke purchased the property at 2636 Forsyth Drive in Penticton approximately 4 years ago. The property had an existing house, that the Lepke's have renovated, as well as an existing in-ground swimming pool. Mr. and Ms. Lepke have constructed a new detached garage on the property since the purchase. During the permitting process, the Lepke's were made aware that the in-ground swimming pool on the property was constructed without a permit.

To obtain a swimming pool permit in the West Bench area of Penticton, the Regional District of Okanagan Similkameen (RDOS) requires an assessment, completed by a qualified geotechnical engineer, stating that the "*the land may be used safely for the uses intended*". To complete this work, the Lepke's have retained GFX to assess site conditions with respect to an existing swimming pool and potential geotechnical/geohazard concerns, as well as its impacts on adjacent and downslope properties.

Through discussions with the property owners, as well as a visual assessment of the property, it is understood that the swimming pool was constructed on bedrock. Bedrock can be seen in the roadway cut slopes, as shown in Photos No. 1 and 2 from Google Earth.

Based upon a review of available information, including the *Klohn Leonoff Report* (August 10, 1992), *Greater West Bench Geotechnical Review* completed by Clarke Geoscience (December 22, 2021), mapping from Okanagan Geology South (Norman Williams, P. Eng.), historical air photos, as well as past geotechnical investigations performed by Ms. LeComte in the West Bench area, GFX has concluded that the existing swimming pool on the property at 2636 Forsyth Drive will not adversely impact the subject property or neighbouring downslope properties.

As stated in this report, the existing swimming pool "*may be used safely for the uses intended*" as required by the BC Land Title Act (Section 86).

1.0 INTRODUCTION AND BACKGROUND

Martin and Lisa Lepke purchased the subject property, 2636 Forsythe Drive, approximately 4 years ago. At the time of purchase the Lepke's were unaware that the in-ground swimming pool existing on the property had been constructed without a building permit. In accordance with *Regional*

District of Okanagan Similkameen (RDOS) Policy No. P3740-00.02, GFX was requested, by the Lepke's, to review site conditions with respect to potential geotechnical/geohazard impacts of the existing swimming pool to the subject property, as well as adjacent and downslope properties.

In order to fulfil the requirements of *RDOS Policy No. P3740-00.02*, GFX reviewed the *Klohn Leonoff Report* findings and recommendations, and made a site reconnaissance visit to assess local site conditions. This report documents the results of a geohazard assessment for the existing swimming pool at 2636 Forsyth Drive, Penticton.

2.0 WORK COMPLETED

GFX completed the following tasks for this assessment:

- Gathered information through discussions with the property owners and contractor pertaining to their knowledge of the construction of the existing swimming pool.
- Completed a site reconnaissance visit of the property to assess site conditions.
- Reviewed the *RDOS Policy No. P3740-00.02*.
- Reviewed the *Klohn Leonoff Report* findings and recommendations.
- Reviewed the *Greater West Bench Geotechnical Review* findings and recommendations.
- Reviewed RDOS and Google Earth aerial and topographic mapping.
- Reviewed Mandeville Land Surveying Inc. survey of the subject property.
- Prepared a report documenting the findings of the geotechnical/geohazard assessment with respect to the impacts of the existing swimming pool to the subject property, as well as adjacent and downslope lots.

3.0 SITE CONDITIONS

The property at 2636 Forsyth Drive is located in the West Bench area of Penticton. The property is surrounded by residential lots, with access along a driveway from Forsyth Drive. The subject property slopes down to the south with the swimming pool located at the south end of the property (See Photo No. 4), as shown on the attached *Figure 2 – Site Plan*.

GFX did not excavate test pits on the property; however, through discussion with the owner of the property, it is understood that the swimming pool is founded on bedrock.

Amber LeComte, P.Eng. of GFX has completed numerous projects in the West Bench area including projects on Lambert Drive, Sandstone Crescent, West Bench Drive, Jonathan Drive, Solana Crescent and Sage Mesa Drive. Local soils in this area of Penticton are generally, either bedrock or SAND and GRAVEL.

Groundwater levels are greater than 5 m below the existing ground elevation.

4.0 GEOHAZARD CONSIDERATIONS

GFX has assessed geohazard conditions as they relate to impacts of the existing swimming pool. The findings and recommendations of the *Klohn Leonoff Report* were taken into consideration as part of this assessment.

The *Klohn Leonoff Report* has mapped the property at 2636 Forsyth Drive as “Gravel or Bedrock Study Area.” These areas have a low to moderate hazard classification. These predominantly granular soils are well drained and generally acceptable as foundation soils.

The existing swimming pool increases the impermeable area on the property. Currently, any pool deck drainage discharges to daylight just below the swimming pool, to the south. No erosion issues were noted as a result of this discharge. Swimming pool deck drainage is maintained on the subject property.

It is understood that when the swimming pool is drained, the water is discharged to the Forsyth Drive ditch. In addition, if the swimming pool were to fail, the water from the swimming pool would exit the swimming pool and drain directly to the Forsyth Drive ditch. From the ditch on Forsyth Drive, any pool runoff or leakage would eventually infiltrate into the soils and eventually make its way to Madeline Lake (See Photo No. 3 and Figure 3 – Drainage Route).

Any drainage from the swimming pool should be carefully controlled and not allowed to discharge a concentrated flow that could cause soil erosion.

5.0 GEOTECHNICAL AND GEOHAZARD CONCLUSIONS

The following points summarize the findings and conclusions of this geohazard assessment:

- This assessment identified only limited geohazards on the property adjacent to the existing swimming pool. Geohazards on other portions of the property were not assessed unless they directly affected the swimming pool.
- The primary geohazard of note near the swimming pool is potential rockfall. The bedrock cut slope below the existing swimming pool is only approximately 8 feet high at the most and is presently stable.
- Local SAND, GRAVEL and COBBLE soils have moderate values of hydraulic conductivity (K), in the range of 10^{-4} m/s to 10^{-2} m/s.
- Bedrock soils have a much lower hydraulic conductivity with any infiltration happening in the joints of the bedrock.
- The existing swimming pool is located approximately 75 m from the nearest downstream house. In the event of a swimming pool leak, the ditch along Forsyth Drive would convey the pool water as shown on the attached *Figure 3 – Drainage Route*. Any pool runoff or leakage would eventually infiltrate into the soils or make its way to Madeline Lake (See Photo No. 3).
- The granular SAND, GRAVEL and COBBLE or soils or bedrock underlying the property at 2636 Forsyth Drive are suitable to support the existing swimming pool. GFX understands that the existing swimming pool was founded on bedrock. Other foundations details such as pinning etc. are unknown.
- Stormwater runoff caused by the swimming pool and deck is currently being managed on site. Current stormwater management on the property is adequate. Any deck drainage from the swimming pool daylights below the swimming pool location on the subject property and will infiltrate into the ground.

6.0 CLOSURE AND LIMITATIONS

This report was prepared for Martin and Lisa Lepke with respect to the review of the existing swimming pool at 2636 Forsyth Drive, Penticton, BC and potential geotechnical/geohazard impacts it may have on the property, as well as adjacent downslope properties

The work was completed in accordance with generally accepted geotechnical engineering practice. No other warranty, expressed or implied, is intended.

This geotechnical assessment was completed on the basis of information available from the *Klohn Leonoff Report* (August 10, 1992), a review of available information and mapping from Okanagan Geology South (Norman Williams, P. Eng.), a review of historical air photos as well as other geotechnical investigations performed by Ms. LeComte in the West Bench area. GFX also completed a site reconnaissance visit to assess the possible consequences of the existing swimming pool.

This assessment has concluded that the existing swimming pool on the property at 2636 Forsyth Drive will not adversely impact the subject property or neighbouring properties. In the context of geohazard concerns, it is our judgement that the subject property ***may be safely used for the existing swimming pool without increasing the geohazard concerns on the subject property, or on adjacent and downstream lands.***

We trust that the contents of this report are appropriate for your requirements. If you have any questions, please don't hesitate to contact our office.



Amber LeComte, P. Eng.
Ground FX Geotechnical Inc.
EGBC Permit No. 1004765

- Attachments:
- 1) Google Earth Street View of Forsyth Drive
 - 2) Site Photos
 - 3) Figure 1 - Location Plan
 - 4) Figure 2 - Site Plan (Mandeville Land Surveying)
 - 5) Figure 3 - Drainage Route

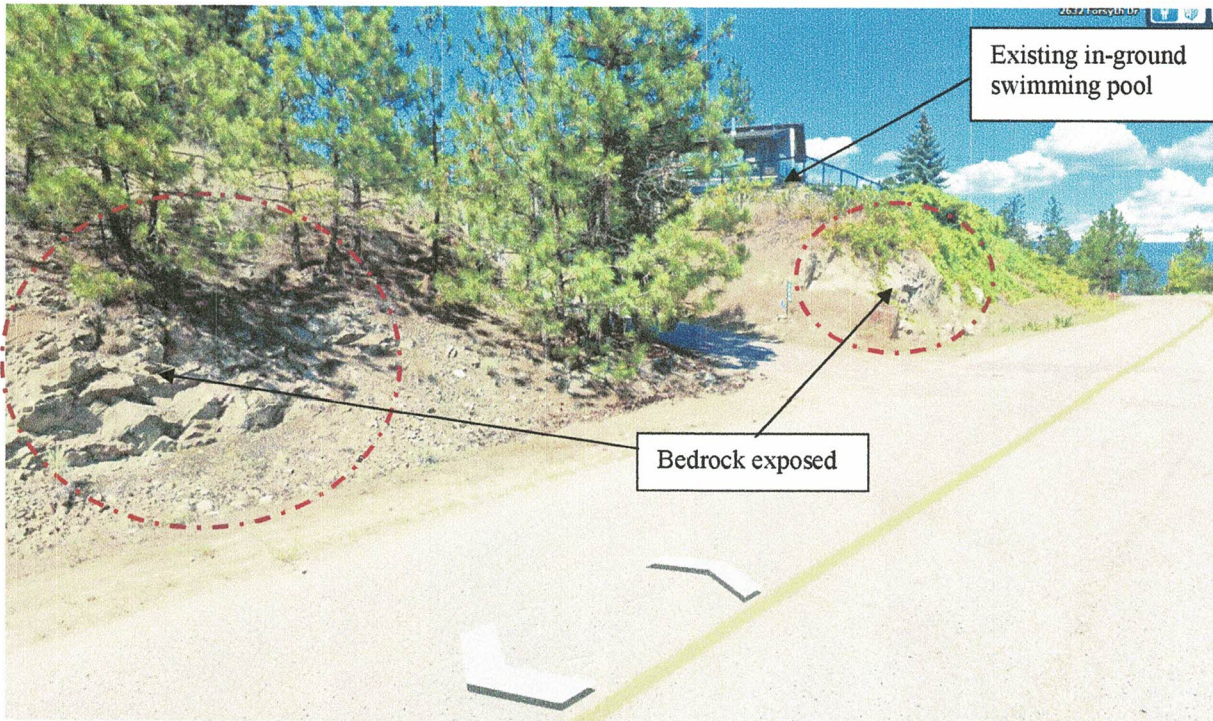


Photo No. 1 (Google Earth): Street view looking east up Forsyth Drive
Note bedrock exposed in cut slopes below pool and just below property.

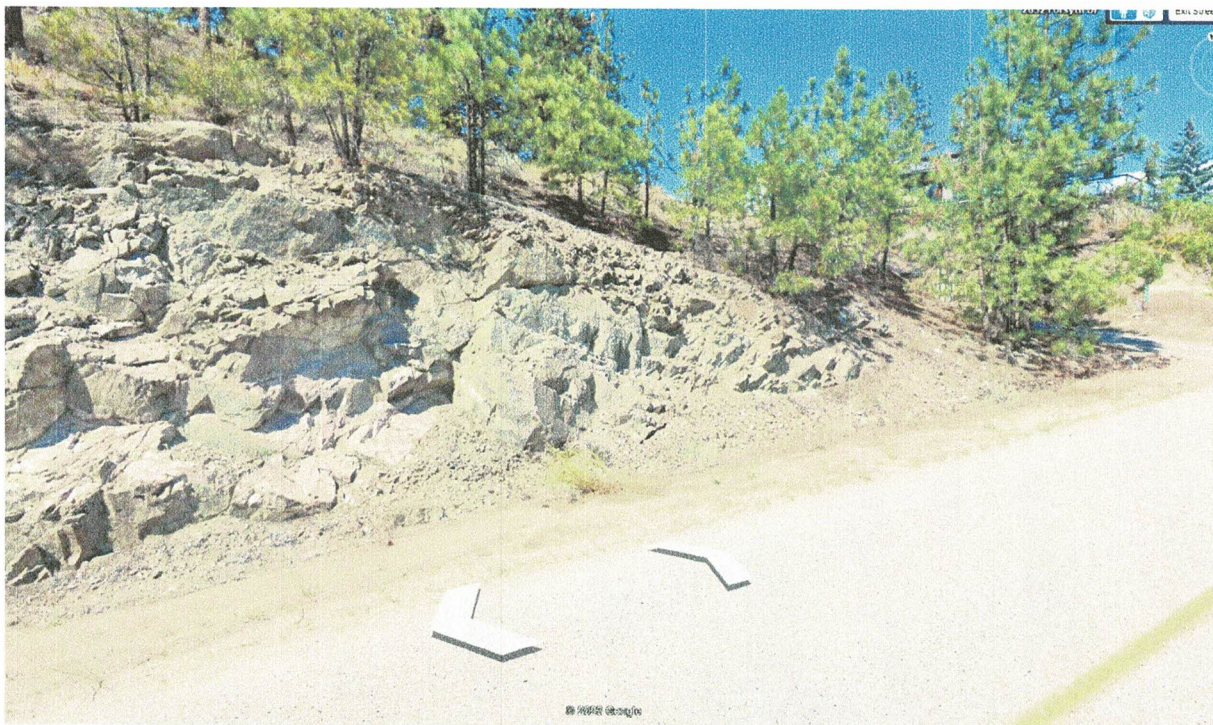


Photo No. 2 (Google Earth): Street view looking northeast up Forsyth Drive
View of bedrock cut slope just below property.



Photo No. 3 : View looking west down Forsyth Drive towards location where any pool leakage or runoff water would infiltrate into the soils along the ditch and eventually make its way to Madeline Lake. (2023 07 31).
See attached Figure 3 – Drainage Route for approximate runoff path.

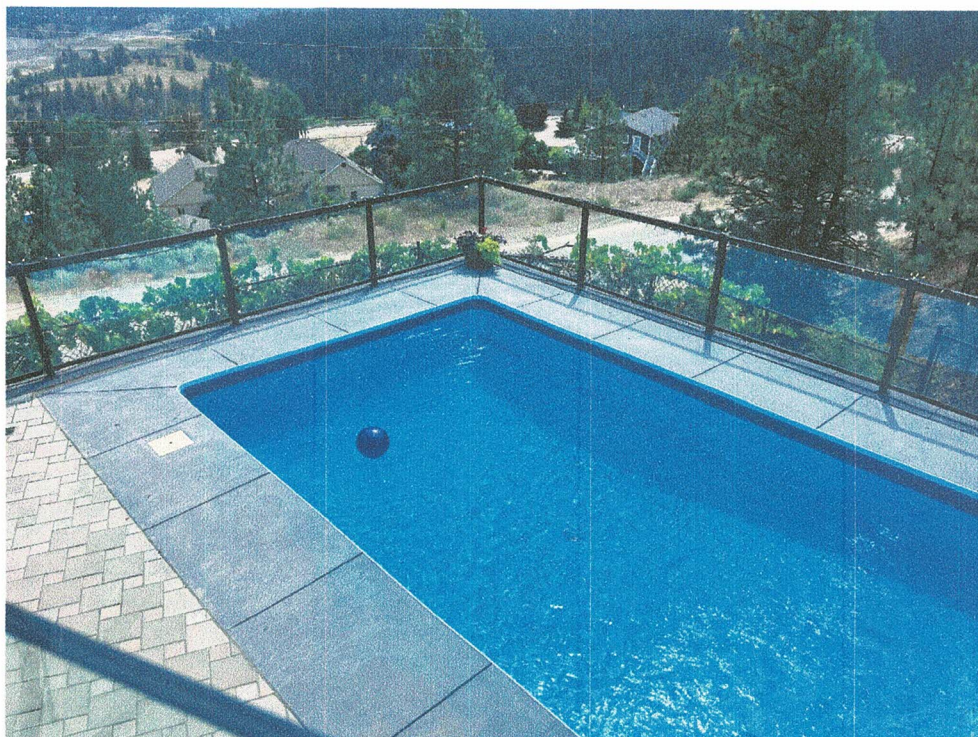


Photo No. 4: View looking south from house through swimming pool location.
Forsyth Drive below (2023 07 06).



PO Box 22042
RPO Penticton Plaza
Penticton, BC V2A 8L1

Project No.:
GFX-1068

Address:
2636 Forsyth Drive
Penticton, BC

Date:
September 6, 2023

Design		
Drawn	AB	2023 09 06
Check		

Revisions:

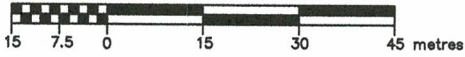
EGBC Permit No. 1004765

Figure 1 - Location Plan

Figure 2 - Site Plan

SITE PLAN SHOWING CERTAIN FEATURES ON LOT 1,
DL 4947, ODYD, PLAN 31947

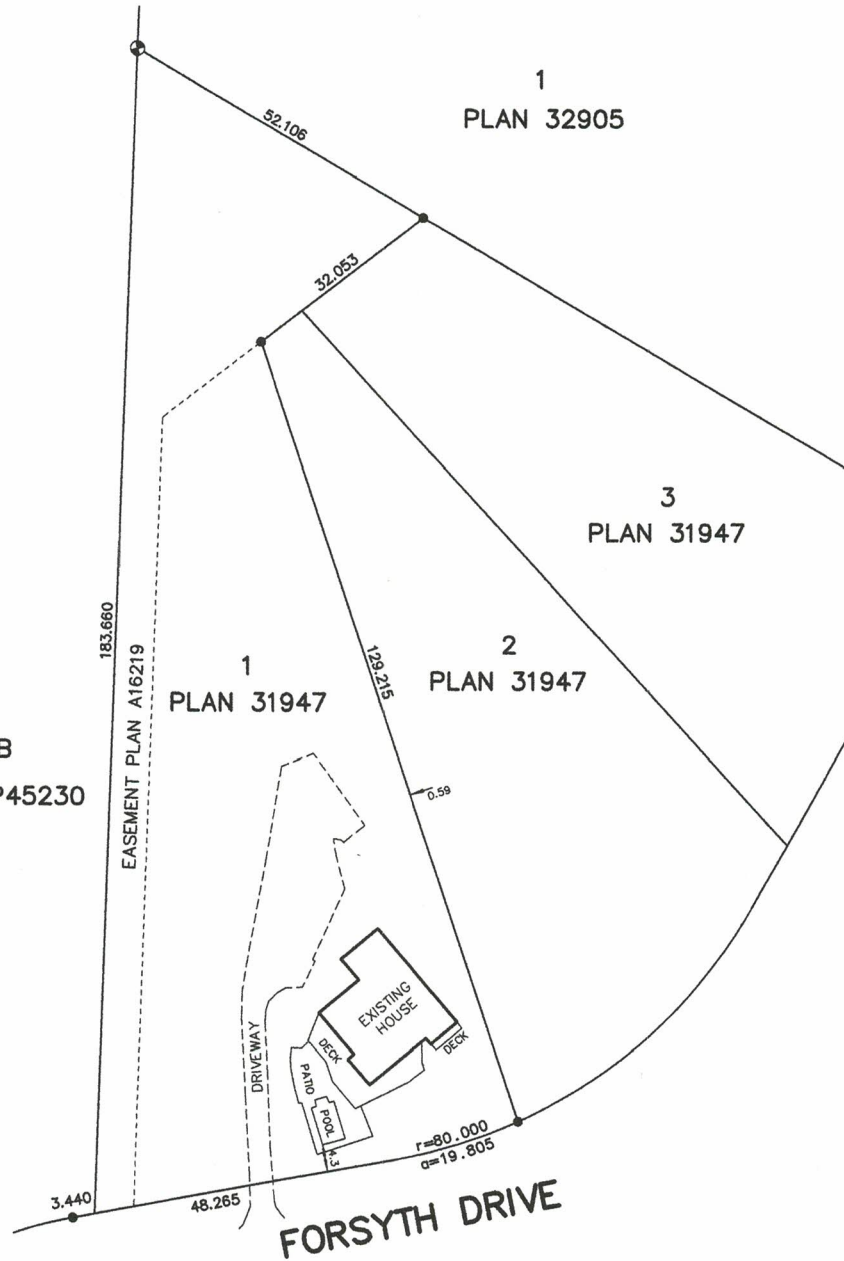
SCALE 1:750



CIVIC ADDRESS: 2636 FORSYTH DRIVE, PENTICTON, B.C.
PID: 003-564-053



REM B
PLAN KAP45230



THIS PLAN IS BASED ON LAND TITLE AND SURVEY AUTHORITY RECORDS AND A FIELD SURVEY. UNREGISTERED INTERESTS HAVE NOT BEEN CONSIDERED.

LAND SURVEYING COMPANY AND SURVEYOR ACCEPT NO RESPONSIBILITY FOR AND HEREBY DISCLAIM ALL OBLIGATIONS AND LIABILITIES FOR DAMAGES INCLUDING, BUT NOT LIMITED TO, DIRECT, INDIRECT, SPECIAL, AND CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH ANY DIRECT OR INDIRECT USE.

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FIELD SURVEY COMPLETED THIS 05th DAY OF SEPTEMBER, 2019.

ALL DIMENSIONS ARE IN METRES AND DECIMALS THEREOF UNLESS OTHERWISE NOTED

LEGEND

- STANDARD IRON POST FOUND
- ⊙ STANDARD CONCRETE POST FOUND

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PO Box 22042
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Pentiction, BC V2A 8L1

Project No.:
GFX- 1068

Address:
2636 Forsyth Drive
Pentiction, BC

Date:
September 11, 2023

Design	AL	2023 09 11
Drawn	AB	2023 09 11
Check		

Revisions:



#GBE Permit No. 1004765

Figure 3 - Drainage Route