



## City Wide Phase 2 Geotechnical Stability Study – FAQs

### **What area of the City is being studied in this Phase 2 Detailed Geotechnical Assessment?**

The study area includes the entire City with the exception of a previous investigation area along the eastern bank of the Mosquito Creek Ravine, from West 17th Street north to Highway 1.

### **Which specific properties are involved in the Phase 2 Detailed Geotechnical Assessment?**

2052, 2048, 2024, 1928, 1900 Mackay Avenue  
837-851; 825-835; 811-823 Westview Crescent  
1978, 1956, 1732, 1716, 1704, Wolfe Street  
621, 620 W 15<sup>th</sup> Street  
651 E 1<sup>st</sup> Street  
2116, 2011 Grand Boulevard

### **Why was the Phase 2 Detailed Geotechnical Assessment completed?**

Experience learned through the examination of slope stability on the Mosquito Creek Ravine led to the initiation of a City Wide examination of landslide risk. The 2009 BGC Phase 1 screening level study identified 16 properties with a significant partial risk for being damaged by landslide. The more detailed Phase 2 refined the risk assessment for properties identified in the Phase 1 study as well as 3 additional properties identified through the Phase 2 process. One property was eliminated from the list.

### **How many properties are impacted?**

18 private properties are included in the study area. Each property has recommendations and risk assessments specific to the property.

### **What were the recommendations in the Phase 1 Overview Assessment?**

- Further detailed assessment of individual properties. These were paid for by the City with the owners consent
- Storm water, including from roofs, pavements, walkways and yards should be captured by the City's storm drainage system. Landscaped areas should be designed to direct run-off away from ravine slope crests
- Measures should be implemented to prevent disposal and placement of non-engineered fill, yard waste or refuse onto ravine slopes
- Existing deposits of non-engineered fill, yard waste or other refuse should be removed from ravine slopes
- New retaining walls or fills on ravine slopes or within 10 metres of a ravine slope crest should be designed, inspected and approved by a Professional Engineer
- Foundations for new habitable structures located on a ravine slope or within 10 m of a ravine slope crest should be designed, inspected and approved by a geotechnical engineer to manage hazards and risks

**What does the Phase 2 Detailed Geotechnical Assessment report say and what does it recommend?**

The report confirms that there is a relatively high risk of a landslide occurring at a few locations throughout the City (primarily on ravine slopes). The report assesses the risk that a slide would present to each of the 18 properties in the study area, and provides specific recommendations to mitigate the risk on each individual site. Ten of the examined 18 properties have an assessed level of risk of “high” to “extreme” and warrant attention.

However, the assessments for six of these ten properties are based on the presence of an attached structure such as a deck or stairs or a secondary dwelling. By simply disconnecting the deck or stairs, or abandoning the secondary structure, the assessed risk would be reduced to “moderate” or better.

Where the risk to a home is high, the owners should proceed with the recommended mitigative measures that can be readily implemented. Houses with a risk rating of very high or extreme under static conditions warrant immediate attention. It is recommended that affected properties owners review the information in the report, and implement the remedial work specific to their property.

While the City emphasizes the need for affected homeowners to proceed with mitigative measures where their home is at risk, we highly recommend all affected property owners to mitigate the potential for land slide affecting their property as explained in the Phase 2 report.

**How does the risk throughout the City compare to the risk assessment used in the District of North Vancouver ?**

The District’s study addresses the risk to an individual; City of North Vancouver’s study addresses the risk to the structure. The District’s study adopts a quantitative approach; the City’s is a qualitative approach. The Phase 2 Detailed Geotechnical Assessment identifies the likelihood of a landslide occurring, the potential for the landslide to interact with a structure, and then estimates the vulnerability of the structure based on available information.

**How does this situation compare to the Blueridge slide area in the District?**

The most significant difference from the Blueridge situation is at this point, no slide has occurred that has damaged a home. Also, there are no homes downslope of the slide area that could be impacted by a slide from above.

**Who is the consultant who conducted the City WidePhase 2 Geotechnical Stability Study? Assessment?**

The study was conducted by GES Geotech Inc., and the professional involved was Mahmoud Mahmoud, P.Eng. GES also retained Michael Porter, P.Eng. from BGC Engineering Inc (the author of the Phase 1 Study) to review the Phase 2 study.

**What should impacted property owners do?**

Property owners should review the information provided by the City. They should attend the information session on January 26, 2012. They should work with the City to implement the report recommendations.

**What is the City doing about this matter?**

The first step is to provide the best available information to the affected property owners as soon as possible and to personally follow up with each property owner to initiate communications. The City will then host a resident information session on January 26 to discuss next steps. Individual meetings with City staff and the geotechnical consultant will also be arranged, upon request.

**What steps is the City taking to mitigate the risk in the area?**

The City will work with affected property owners to help them implement the remedial actions recommended in the phase 2 detailed assessment. The City has offered to conduct a detailed investigation of on-site drainage conditions and to develop drainage improvement plans for individual property owners.

**Where can property owners find out more about their particular property and related risks?**

The current engineering report provides specific information on each of the 18 properties within the study area. For additional information, affected property owners should contact the City of North Vancouver to arrange a meeting with City staff and the City's geotechnical consultant.

**Does this report mean that all houses identified in the report are not safe to inhabit?**

Many of the houses are 30 to 40 years old, and the risk has been present throughout that time, and presumably has been acceptable to the occupants up to this point. Of the 18 properties: 5 have "extreme" risk ratings that can be mitigated by relatively simple, low cost solutions. Of the remaining 13 properties there are 3 homes that are considered to be at a high risk, 1 at a very high risk, and 1 at extreme risk. Where the risk to a home is high, the owners should proceed with those mitigative measures that can be readily implemented. Houses with a risk rating of very high or extreme, warrant immediate attention.

**Who is supposed to pay for the remediation work to the homes?**

The costs of remedial work on private properties will be the responsibility of the respective property owners, however the City will waive all permit fees.

**What kind of cost will this be to the homeowners?**

Detailed cost estimates can only be completed once property owners have reviewed the remediation options with a geotechnical engineer, and then decided on the best options for their specific property.

**What is the timeframe for this work to be done?**

Properties with an assessed risk to the home of high or greater should implement the recommended remedial work in 2012. Slope stabilization and building upgrades on lower risk properties can be implemented over a longer term.

**How will the City assist impacted property owners with this process?**

The City will continue to assist property owners by providing project coordination services to help residents implement mutually beneficial remedial works. City permit fees for all remediation work will be waived.

**Why are some homes not connected to the storm sewer?**

Many homes within the study area are 30 to 40 years old. Standards and awareness changes over time. As the City became aware of slope concerns and drainage issues, builders were directed to pipe storm water to the bottom of the slope or connect to the City storm system.

**Can people place fill in their yards without a permit?**

Through the City's new Riparian Areas Strategy, all properties adjacent to watercourses, including ravines with steep slopes, now require a Development Permit. As a result, the City now regulates the placement of fill or any other significant work on these properties.

**How is the City monitoring the situation?**

Based on historic experience, the City's practice has been to visually inspect the steep slope areas during prolonged wet weather during late fall and winter, supplemented by visual inspection by contracted geotechnical consultants then City staff were of the opinion that it was warranted. Residents are advised to contact the City immediately if they notice any change in the slope conditions.

**Where can property owners get more information?**

Information is available on the City's web site at [www.cnv.org/StabilityStudy2](http://www.cnv.org/StabilityStudy2). An information meeting was held on January 26th, 2012 at City Hall. Property owners can contact Tony Barber, Acting Deputy City Engineer, at 604-983-7338 or [tbarber@cnv.org](mailto:tbarber@cnv.org).

**What if property owners refuse to take the required action?**

Our hope is that owners appreciate the seriousness of the situation and voluntarily take action for their own benefit. The City is sufficiently concerned for the safety of the owners at risk that the City is prepared to exercise its authority under the Community Charter to invoke an enforcement order requiring owners to take the required action.

**Some property owners are suggesting that the risk is exaggerated and they should not have to do anything. Is the City being overly cautious?**

The City has relied on the advice of Professional Geo-technical Engineers experienced in slope stability to provide us with advice on the nature and degree of risk.

The City has tried to seek reasonable balance between life safety concerns, and economic impact and stress that news such as this will cause to affected residents. For example, strictly applying present day standards onto existing homes implies that homes with a specific risk of moderate or greater should be remediated until the risk is reduced to low or better.

However, to be reasonable, the City is only requiring homes with a specific risk of high or greater to be remediated. This is not to say that all other homes are safe. It just sets the partial risk threshold at high or greater where the City is so concerned for safety that we feel we must require action to be taken. We would also like all other homeowners to be mindful of the information provided to them about their properties and voluntarily do any recommended work.

*January, 2012*