

MR. A. HOGARTH
(District of Mission Subdivision Application S89-79)

HYDROGEOLOGIC EVALUATION IN REGARD TO DISPOSAL OF
WASTEWATER AND STORM WATER ON A PROPOSED SUBDIVISION
AT 33243 CHERRY AVENUE IN THE DISTRICT OF MISSION

PACIFIC HYDROLOGY CONSULTANTS LTD.

FEBRUARY 7, 1990

PACIFIC HYDROLOGY CONSULTANTS LTD.
CONSULTING GROUNDWATER GEOLOGISTS

204 - 1929 WEST BROADWAY
VANCOUVER, B.C. V6J 1Z3
TELEPHONE: (604) 738-9232

February 7, 1990

Mr. A. Hogarth
c/o Genesis Development Consultants Ltd.
22320 - 119 Avenue
MAPLE RIDGE, B. C. V2X 2Z3

Subject: Hydrogeologic Evaluation in Regard to Disposal of
Wastewater and Storm Water on a Proposed
Subdivision at 33243 Cherry Avenue in the District
of Mission
District of Mission Subdivision Application S89-79

Dear Sir:

This letter is further to several recent telephone discussions, facsimile transmissions and to our discussion onsite at the subject property on January 18.

1.0 INTRODUCTION

The purpose of this letter is to discuss our hydrogeologic evaluation concerning the proposed subdivision of the subject parcel of land at 33243 Cherry Avenue in the District of Mission, legally described as Lot A, Sec. 28, Tp. 17, Plan 10589, New Westminster District. The layout of the proposed subdivision is shown on Genesis Development Consultants Ltd. Drawing No. 89-031, dated September 1989.

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and Storm Water on a Proposed Subdivision at 33243 Cherry
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In preparation of this letter, the following has been understood about the proposed subdivision:

1. With the exception of Lots 1, 2, 11, 12 and 13, the subdivision is to be served by a sanitary sewer along Cherry Avenue.
2. Previous work concerning soil and groundwater conditions on the subject property has been carried out by CTI-Construction Testing & Inspection Ltd. and is reported in the following:
 - a. A letter-report dated November 23, 1989 to Mr. Al Hogarth from CTI which includes the descriptive logs of ten test pits and a map showing the locations of the pits.
 - b. A letter dated December 4, 1989 to Mr. Al Hogarth from CTI "RE: Hydrogeological Considerations..."

The CTI letter-report and letter listed above are attached to this letter. The pits described in the CTI letter-report of November 23, 1989 had been dug and filled in before our involvement; we accept the CTI descriptions but, as previously discussed (Livingston, Hogarth), ground disturbance indicates that Test Pit 9 was dug on Lot 12, generally directly north of the boundary between Lots 1 and 2, and not on Lot 13.

3. Except for Lots 12 and 13, tentative approval has been obtained from the Health Inspector, Stuart Baynton, for the use of onsite wastewater disposal facilities on the relevant five lots of the 24-lot subdivision. We (Ed Livingston) confirmed this in a telephone discussion with Mr. Baynton on February 6.

As required by the District of Mission, the purpose of this letter-report is to expand upon the information

presented in the CTI Reports, in order to fully address the following:

1. Investigation and interpretation of the soil and groundwater conditions to assess their suitability for disposal of surface storm water and wastewater from domestic systems, including an examination of both short and long-term effects.
2. Consideration as to whether the proposed lot layout is acceptable or should be revised.
3. Evaluation of the short and long-term effects on adjacent properties of the disposal of storm water and wastewater from the proposed subdivision.

2.0 TOPOGRAPHY AND SURFICIAL GEOLOGY

The subject property is located on the north slope of a ridge, near the ridge crest; the ridge runs more or less east-west, with the crest located a short distance south of Cherry Avenue. This ridge is probably a glacial moraine deposited by ice which advanced from the north at the end of the last glacial event in the area. The ridge marks the south edge of an extensive area of low relief that extends about $1\frac{1}{2}$ kilometres to the north and has a similar east-west width.

The CTI test pit descriptions show that this low relief area is underlain by clean grey sand of medium grain size. The sand is covered by windblown silt (loess), described in the CTI test pit logs as "loose, brown, sandy Silt", "loose, brown Silt" or "brown, sandy Silt". The test pits show that the loess is also present on top of the moraine ridge.

3.0 GROUNDWATER HYDROLOGY

The movement of groundwater under the subject property is northward, as is the surface water drainage. The presence of the east-west trending ridge controls the quantity of groundwater flowing in the near-surface sediments under the property; the amount of groundwater flowing in this shallow system is rather small. The most likely explanation for the shallow water table in the permeable sand on the northern part of the property in the winter months is that the groundwater gradient in the northward direction is low. Obviously any storm water or wastewater which enters the ground will join the northward-flowing groundwater. The shallow water table on the northern part of the subject property - in particular, on Lots 12 and 13 - is shown by:

1. the type of vegetation;
2. the presence of standing water in old overgrown drainage ditches and in several small hand-dug holes in the area;
3. CTI's descriptions of Test Pits 7 and 9 which state "Moderate to heavy seepage @ 3'-0"... and "moderate seepage @ 1'-8")", respectively.

4.0 WASTEWATER DISPOSAL

The quantity of wastewater that would be added to the existing groundwater flow system from facilities on the proposed five lots is negligible in terms of the quantity of water in the system. However, because the thickness of the unsaturated zone on Lots 12 and 13 is insufficient to provide treatment of the wastewater before it reaches the groundwater, conditions on these lots are not suitable for conventional wastewater disposal systems consisting of a septic tank and tile drain field. However, after more work is carried

Mr. A. Hogarth

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and Storm Water on a Proposed Subdivision at 33243 Cherry
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out on the property, and at such time as the lot boundaries are better defined, it may be possible to locate sites on Lots 12 and 13 where fill can be placed to increase the thickness of the unsaturated zone to the Ministry of Health standard such that conditions would then be suitable for disposal fields.

5.0 STORM WATER DISPOSAL

We note that the previously mentioned CTI Letter-report of November 23 recommends that "...storm water should be collected and directed away from the site in tight lines." In our opinion, this is a sound recommendation, especially for the smaller lots along the access road on the east side of the property. Storm water could be directed into the natural drainage to the northwest.

It should be possible to use rock pits to dispose of storm water on the larger western lots (Lots 1, 2 and 11). Such pits should obviously be located a sufficient distance from wastewater disposal fields so that there is no interference and they should be located in the downslope direction from wastewater disposal fields.

6.0 CONCLUSIONS AND RECOMMENDATIONS

1. Conditions on Lots 12 and 13 of the proposed subdivision are unsuitable for the use of conventional wastewater disposal systems.

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2. Storm water on the proposed subdivision should be collected and directed away from the site; it could be conveyed into the natural drainage to the northwest.
3. On the large western lots (1, 2 and 11), rock pits could be used to dispose of storm water but the locations for such pits should obviously be selected with care to avoid interference with wastewater disposal fields.
4. There is no reason to alter the lot layout of the proposed subdivision; assuming that wastewater and storm water disposal facilities are properly located and constructed, there is unlikely to be any short or long-term adverse impacts to the surrounding area.

Yours truly,

PACIFIC HYDROLOGY CONSULTANTS LTD.



E. Livingston, P. Eng.

Attachments

ATTACHMENTS

PACIFIC HYDROLOGY CONSULTANTS LTD.
CONSULTING GROUNDWATER GEOLOGISTS

204 - 1929 WEST BROADWAY
VANCOUVER, B.C. V6J 1Z3
TELEPHONE: (604) 738-9232

February 7, 1990

Mr. A. Hogarth
c/o Genesis Development Consultants Ltd.
22320 - 119 Avenue
MAPLE RIDGE, B. C. V2X 2Z3

Subject: Proposed Subdivision at 33243 Cherry Avenue in the
District of Mission

Dear Sir:

As you requested in your facsimile transmission of February 6, we have prepared a report to "fill in any blanks from C.T.I.", in order to satisfy the requirements of the District of Mission for an hydrogeologist's report. We trust that the report enclosed herewith will resolve this matter.

You will note that our report states that copies of the CTI letter-report of November 23, 1989 and letter of December 4, 1989 are attached. The only copies of the CTI correspondence that we have are facsimile copies; therefore, would you please attach legible copies taken from the originals in order to complete the report. Because of these circumstances, we are only providing the original copy of the report unbound.

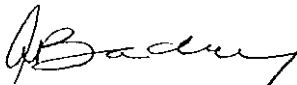
We are also herewith submitting a replacement invoice for work on this project. We request that you destroy both previous letters and invoices.

Mr. A. Hogarth
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Please call if you have any further concerns.

Yours truly,

PACIFIC HYDROLOGY CONSULTANTS LTD.

A handwritten signature in cursive script, appearing to read "A. Badry".

A. Badry,
Hydrogeologist

Enclosures

PACIFIC HYDROLOGY CONSULTANTS LTD.
CONSULTING GROUNDWATER GEOLOGISTS

204 - 1929 WEST BROADWAY
VANCOUVER, B.C. V6J 1Z3
TELEPHONE: (604) 738-9232

February 5, 1990

Mr. A. Hogarth
c/o Genesis Development Consultants Ltd.
22320 - 119 Avenue
MAPLE RIDGE, B. C. V2X 2Z3

Subject: Proposed Subdivision of a Parcel of Land at 33243
Cherry Avenue in the District of Mission

Dear Sir:

This letter is further to our (Hogarth, Livingston) discussion of January 18 onsite at the subject property. Since the aforementioned site visit of January 18, we have received by facsimile from Mr. John Duguid, M.I.T.E., A.Sc.T., of Genesis Development Consultants Ltd., a revised subdivision plan of Lot A, Sec. 28, Tp. 17, N.W.D., Plan 10589. The purpose of this letter is to comment on hydrogeological conditions observed on the property in regard to the feasibility of using conventional onsite wastewater disposal facilities on Lots 12 and 13. We understand that tentative approval has been obtained for all of the lots on the proposed subdivision plan (Genesis Development Consultants Ltd. Drawing No. 89-031) except for Lots 12 and 13.

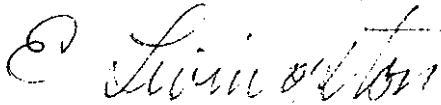
In conducting our investigation, and in preparing this letter, we have considered data contained in a letter-report dated November 23, 1989 to you (Al Hogarth) from CTI-Construction Testing and Inspection Ltd. - in particular, Table 1 "Summary of Test Pit Logs" which is attached. CTI Table 1 contains the descriptive logs of ten test pits; the locations of the test pits are shown on Plate 1 "Approximate Test Pit Locations", which is also attached to the aforementioned CTI Letter.

Mr. A. Hogarth
Proposed Subdivision of a Parcel of Land at 33243 Cherry Avenue
in the District of Mission
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We trust that this letter fulfills your requirements.
Please call if you have any questions about this letter or if
we can be of further assistance at this time.

Yours truly,

PACIFIC HYDROLOGY CONSULTANTS LTD.

A handwritten signature in cursive script, appearing to read "E. Livingston".

E. Livingston, P. Eng.

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CONSULTING GROUNDWATER GEOLOGISTS

204 - 1929 WEST BROADWAY
VANCOUVER, B.C. V6J 1Z3
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January 25, 1990

Mr. A. Hogarth
c/o Genesis Development Consultants Ltd.
22320 - 119 Avenue
MAPLE RIDGE, B. C. V2X 2Z3

**Subject: Proposed Subdivision of a Parcel of Land at 33243
Cherry Avenue in the District of Mission**

Dear Sir:

This letter is further to our (Hogarth, Livingston) discussion of January 18 onsite at the subject property. Since the aforementioned site visit of January 18, we have received by facsimile from Mr. John Duguid, M.I.T.E., A.Sc.T., of Genesis Development Consultants Ltd., a revised subdivision plan of Lot A, Sec. 28, Tp. 17, N.W.D., Plan 10589. The purpose of this letter is to comment on hydrogeological conditions observed on the property in regard to the feasibility of using conventional onsite wastewater disposal facilities on Lots 12 and 13. We understand that tentative approval has been obtained for all of the lots on the proposed subdivision plan (Genesis Development Consultants Ltd. Drawing No. 89-031) except for Lots 12 and 13.

In conducting our investigation, and in preparing this letter, we have considered data contained in a letter-report dated November 23, 1989 to you (Al Hogarth) from CTI-Construction Testing and Inspection Ltd. - in particular, Table 1 "Summary of Test Pit Logs" which is attached. CTI Table 1 contains the descriptive logs of ten test pits; the locations of the test pits are shown on Plate 1 "Approximate Test Pit Locations", which is also attached to the aforementioned CTI Letter.

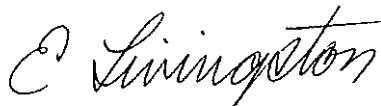
Mr. A. Hogarth
Proposed Subdivision of a Parcel of Land at 33243 Cherry Avenue
in the District of Mission
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Following our (Hogarth, Livingston) meeting at the site on January 18, I examined the property more carefully and I located the sites of all of the test pits shown on the CTI Location Map; the pits had all been filled in so I was not able to observe the conditions first hand. With the exception of Test Pit 9, the locations are approximately as shown on the Plan; ground disturbance shows that the probable location for Test Pit 9 is directly north of TP8 and west of TP7. The CTI record for TP9 describes it as being located "410' from Cherry St., N. of TP8". The distance given would place TP9 near the site I have mentioned above. In any case, TP9 is clearly not located on Lot 13 as shown on the CTI Plan.

Lots 12 and 13 are both located in a swampy area as shown by the type of vegetation and by the presence of standing water in old overgrown drainage ditches and in several small hand-dug holes in the area. From our observations and from the information on hand, it is our opinion that it is not feasible to use conventional wastewater disposal systems, consisting of a septic tank and tile drain field, on Lots 12 and 13 of the proposed subdivision at 33243 Cherry Avenue.

As we (Hogarth, Livingston) discussed onsite at the subject property, a reasonable course of action would be to withdraw these two lots from the proposed subdivision at this time. After more work is carried out on the property and at such time as the lot boundaries are better defined, it may be possible to locate sites on Lots 12 and 13 which are suitable for disposal fields.

Yours truly,
PACIFIC HYDROLOGY CONSULTANTS LTD.



E. Livingston, P. Eng.

Note to File - Hogarth

I met with Mr. Hogarth at his property at 33243 Cherry Avenue in the District of Mission. The property in question is located on the north side of Chery Avenue; it slopes gently northwestward. Mr. H. had a plan of the proposed subdivision and also a reduced copy of the plan. These plans have contours. Mr. H said that the problem Lots are 12 and 13.

The sewer along Cherry Avenue extends about as far as Lot 4. All of the eastern lots, including Lot 14, will be coupled to the sewer by using individual sanitary pumps. Mr. Hogarth said that Lots 1, 2, 3 and 10 have all been "verbally" approved by Stuart Baynton (Medical Officer of Health); therefore, the only lots to be investigated are 12 and 13.

It is clear that Lots 12, 13 and 14 are located in a swampy area; they are covered by a jungle of alder, willow and other phreatophytes. The land was once cleared and has ditches north and eastward which are badly overgrown. We (Hogarth, Livingston) walked through the wet area and located only a few hand dug "perc" holes. Mr. H. seemed to be under the impression that more holes had been dug. We found the northwest corner where there is a small rise that is not waterlogged. TP9 is not in that area as shown on the plan attached to the CTI letter-report. The note on the CTI record of the pit states that TP9 is located 410 ft from TP8, which is located quite close to Cherry Avenue; 410 ft would not bring it close to where it is. However, there is a disturbed area, probably TP9, at a distance about 300 (310?) ft from TP8; this would place it in the northeast corner of Lot 1.

I told Hogarth that I could not see how Lots 12 and 13 could be made to qualify and that perhaps the best course of action is to proceed without these two lots. I told Hogarth that the area is probably underlain by the grey sand and could probably be drained but that this would require a regional ditch to service the local ditches. Mr. H. said that he will discuss the situation with John Duguid and others and then decide what course of action to follow. He will contact us. Any correspondence should be sent in care of Genesis Development Consultants Ltd. (22320 - 119 Avenue, Maple Ridge, B. C. V2X 2Z3).



E. Livingston

January 18, 1990

Note to File - Construction Testing and Inspection Ltd.

Yotesh Nathawad of Construction Testing & Inspection Ltd. of Port Coquitlam called to say that they are working for Mr. L. Hogarth c/o Genesis Development Consultants Ltd. (22320 - 119 Avenue, Maple Ridge, V2X 2Z3) on a property on Cherry Avenue, Mission. This is a block 550 ft by 550 ft to be subdivided into 24 (?) lots. Most lots are on the sewer but five need onsite disposal. C.T.I. has dug and logged holes on the property; these holes were up to 16 ft deep and they were dug for subsurface conditions but not disposal. Yotesh N. asked whether we could use these holes to prepare a report for the five lots. I said that we must see the logs and also visit the site. I told him that Health demands that holes to four feet be left open over the winter for water levels. I gave him a price of \$450. to \$550. if we fit the trip in with other work and can use his material. The owner had not budgeted for such a report as the requirement is new to them.

Yotesh N. 'phoned back later to say to proceed and to make a special trip if necessary; we should try to get it done this week.

E. Livingston

January 16, 1990