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PRELIMINARY INVESTIGATION OF HYDROGEOLOGIC CONDITIONS ON THE PROPOSED G. & W. RETZLAFF SUBDIVISION AT 9097 DEWDNEY TRUNK ROAD IN THE DISTRICT OF MISSION

PACIFIC HYDROLOGY CONSULTANTS LTD.

JUNE 19, 1990

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June 19, 1990

Mission Realty Ltd.
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Attention: Messrs. Art Carter and Jim Grieve

Subject: **Preliminary Investigation of Hydrogeologic Conditions on the Proposed G. & W. Retzlaff Subdivision at 9097 Dewdney Trunk Road in the District of Mission**

Dear Sirs:

This letter is further to a discussion of June 14 on site between Mr. Jim Grieve and Ed Livingston, P. Eng., of Pacific Hydrology Consultants Ltd., about the feasibility of using conventional onsite wastewater disposal facilities on a proposed five-lot subdivision at 9097 Dewdney Trunk Road in the District of Mission.

1.0 INTRODUCTION

As agreed between Grieve and Livingston on June 14, the purpose of this letter is to present our preliminary evaluation of hydrogeologic conditions on the subject parcel of land at 9097 Dewdney Trunk Road, as they would affect the use of onsite wastewater disposal facilities. A more definitive assessment, as required by District of Mission to obtain final subdivision approval, will be needed after further drainage improvements have been made. Also, as discussed (Grieve, Livingston), such a detailed investigation should be carried out at a time of maximum groundwater conditions between mid January and mid March.

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Along with a site investigation by E. Livingston on June 14, the following documents were considered in the preparation of this letter:

1. N.T.S. topographic map 92G/1f, **Mission**, of scale 1:25,000 and 1:2,500 District of Mission topographic plan, Sheet No. 1733S.

2. Geological Survey of Canada Map 1485A, **Surficial Geology Mission British Columbia**; scale 1:50,000, 1980.

3. Geological Survey of Canada Bulletin 322, **Post-Vashon Wisconsin Glaciation, Fraser Lowland, British Columbia;** by J.E. Armstrong, 1981, 34 pp.

4. Geological Survey of Canada Paper 82-23, **Environmental and Engineering Applications of the Surficial Geology of the Fraser Lowland, British Columbia;** by John E. Armstrong, 1984, 54 pp.

5. **Design Manual Onsite Wastewater Treatment and Disposal Systems;** United States Environmental Protection Agency, October 1980, 392 pp.

6. B.C. Ministry of Health **Sewage Disposal Regulation** (B.C. Reg 411/85, O.C. 2398/85), Sept. 30/86, 17 pp.

The regional topographic setting of the subject property is shown on Figure 1 included in the attachments to this letter. The layout of the proposed subdivision is shown on Figure 2. The legal description of the proposed Retzlaff Subdivision is Lot 6, Sec. 33, Tp. 17, Plan 2149, N.W.D. (PID 012-508-926). In carrying out this preliminary investigation, we have understood the following about the proposed subdivision:

1. The 2.2 hectare (5.35 acre) parcel is to be subdivided into five lots ranging in size from 0.35 to 0.45 hectares (0.88 to 1.12 acres).

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2. The area is supplied by municipal water but wastewater disposal would be to ground using conventional individual onsite facilities.

2.0 TOPOGRAPHY, DRAINAGE AND SURFICIAL GEOLOGY

The subject property is located on a gentle west-facing slope on the west side of Dewdney Trunk Road. The west end of the property is partly in a swamp that drains into a west-flowing tributary of Silverdale Creek. The land rises for a short distance east of Dewdney Trunk Road to the crest of a low north-south trending ridge.

According to GSC Map 1485A of the surficial geology, the area of the subject parcel of land is underlain by Sumas Drift described in that area as "sandy till and substratified drift, 2 to 10 m thick". The sediments exposed in drainage trenches on the property certainly fit this description. The ridge to the east, which seems to be one of several moraine ridges in the Mission area, is composed of these glacial sediments. The only subsurface exposures in the area are in the drainage trenches which were dug on the proposed subdivision by an excavator about two months ago. The approximate (unsurveyed) locations of these trenches have been added to the sketch layout plan of the subdivision attached to this letter as Figure 2. At the time of Ed Livingston's field investigation of June 14, the trenches were carrying water, part of it from ditches along Dewdney Trunk Road.

The main east-west drainage trenches and the trench along Dewdney Trunk Road show a more or less continuous shallow cross-section of the sediments to a maximum depth of two metres in that part of the trench along the south boundary of the

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property. The sediments range in grain size from silt to gravel, the largest portion being silty sand. There is a brown silty loam soil over most of the property, with black organic muck up to about one-half metre thick in the swampy western part.

3.0 GROUNDWATER HYDROLOGY

The shallow groundwater on this property, which is being partly collected by the recently constructed drains, originates from local precipitation on the property itself and on the ridge east of Dewdney Trunk Road. The ridge and its western slope create a small groundwater flow system consisting of the recharge area on the ridge and a discharge area in the swampy ground on the west end of the property. Because the flow system is quite small and since recharge probably occurs mostly in winter and early spring, it seems likely that flow probably fluctuates widely and that there is a significant rise and fall in the water table under the proposed subdivision.

The presence of colour mottling in the walls of the trenches confirms that there is a significant fluctuation in the shallow water table. Much of the water running in the trench along the south boundary comes from the ditch along the west side of Dewdney Trunk Road. At the time of Ed Livingston's site visit of June 14, the ditch on the east side of Dewdney Trunk Road was full of standing water; clearly, some of the water tends to pass under the road into the subject property and, in fact, it can be seen as seepage on the up-slope side of the trench along the Road.

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4.0 DISCUSSION

It is clear that the subject property at 9097 Dewdney Trunk Road requires proper drainage, which must be deeper than the ditches already installed. The drainage system should be tied into the Creek close to the northwest corner of the property. Also, the existing ditches are not very effective because they do not have proper grade. This is not to criticize the existing ditches, which we understand were excavated very rapidly to get drainage started and which could not be tied to the Creek at the time they were dug because of fisheries regulations.

All things considered, a properly constructed system of buried drains, along with improved drainage along Dewdney Trunk Road, is likely to be effective in holding the water table below a depth of one metre over most, if not all, of the property. The most difficult area is likely to be the swamp along the western boundary; however, the sediments underlying the black organic swamp soil appear to be permeable enough to support drains so that this area can probably be drained effectively.

The effectiveness of a drainage system on this particular property can only be judged during the time of maximum groundwater flow, probably between mid January and mid March. During that period, groundwater levels can be observed in dug holes or in small diameter observation wells located away from drains.

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5.0 CONCLUSIONS

1. In general, conditions on the proposed Retzlaff Subdivision at 9097 Dewdney Trunk Road appear to be suitable for the construction and operation of onsite wastewater disposal facilities provided that a properly designed and constructed drainage system is installed to prevent unacceptable seasonal rises in the groundwater table.

2. Before a final assessment of hydrogeologic conditions can be made, it will be necessary to observe shallow groundwater conditions in late winter with proper drainage in place.

6.0 RECOMMENDATIONS

1. Install a properly designed and constructed system of drains discharging to Silverdale Creek.

2. Improve the road drainage along the portion of Dewdney Trunk Road in the area of the proposed Retzlaff Subdivision.

Yours truly,

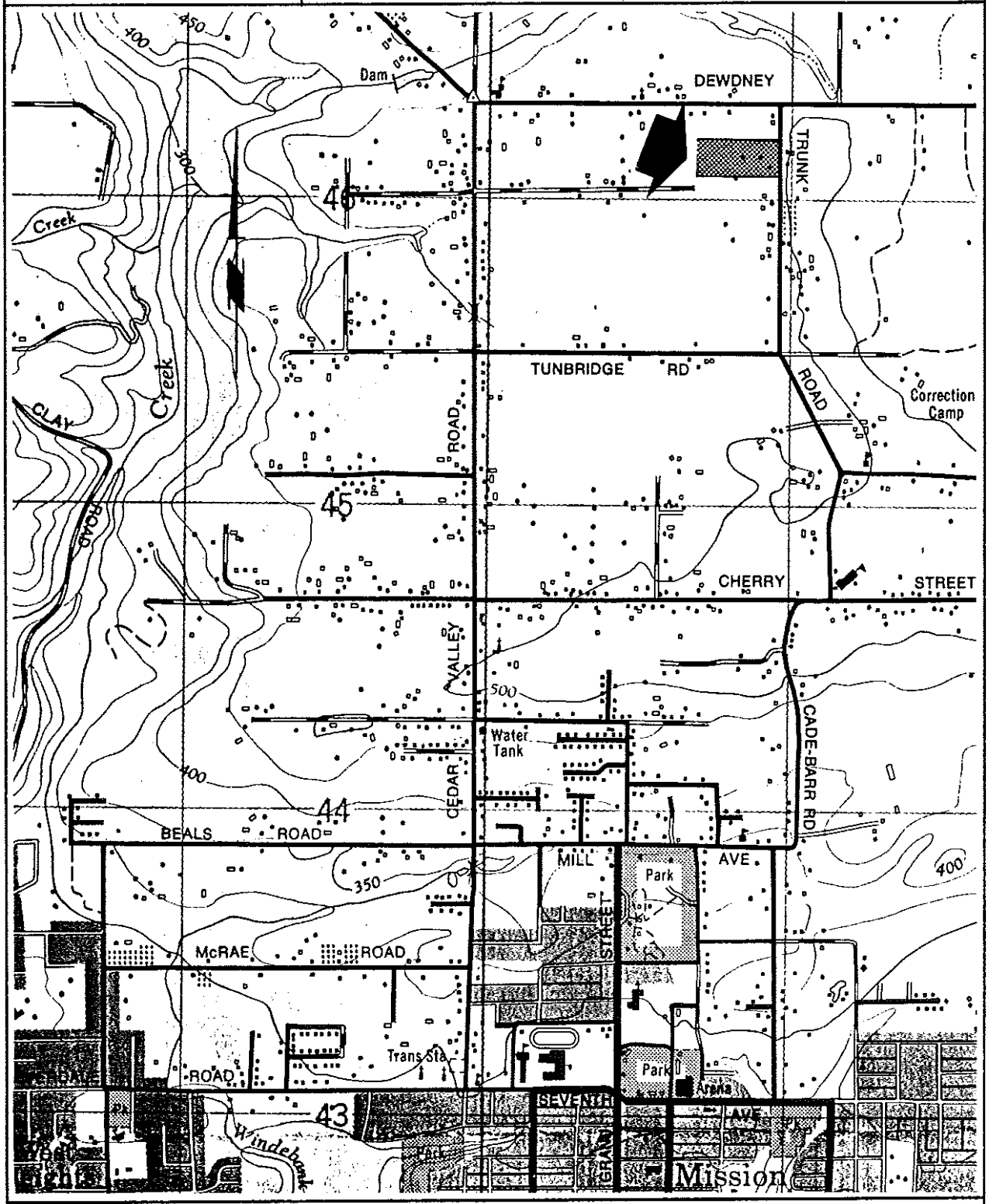
PACIFIC HYDROLOGY CONSULTANTS LTD.

Ed Livingston

Ed Livingston, P. Eng.

Attachments

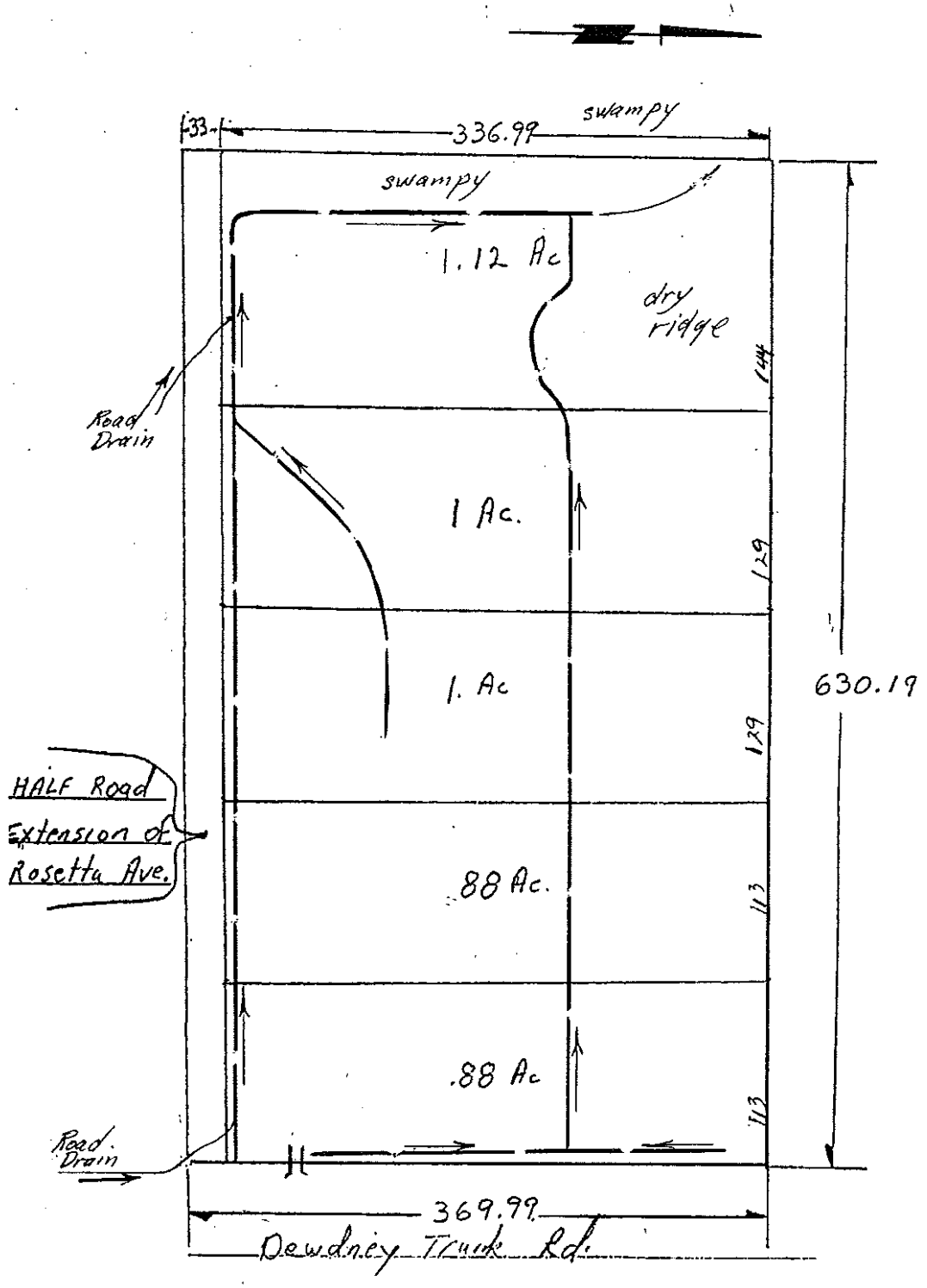
FIGURE 1	AREA LOCATION MAP - PROPOSED RETZLAFF SUBDIVISION AT 9097 DEWDNEY TRUNK ROAD



Notes:

1. The base map is 1:25,000 scale topographic map N.T.S. 92G/1f, **Mission**, enlarged to a scale of approximately 1:20,000; contour interval is 50 ft.
2. ▶▒ indicates the location of the Retzlaff Property.

FIGURE 2	LAYOUT PLAN OF PROPOSED RETZLAFF SUBDIVISION AT 9097 DEWDNEY TRUNK ROAD, MISSION



Notes:

1. Legal description of Retzlaff Property: Lot 6, Sec. 33, Tp. 17, Plan 2149, N.W.D.
2. Scale: as shown.
3. — — — indicates approximate (unsurveyed) location of a drainage trench.