

September 6, 1978

Mr. Robert Mathis
Wasatch County Planner
25 North Main Street
Heber City, UT 84032

Dear Mr. Mathis:

Reference is made to your letter of April 3, 1978. We have investigated the Hoover Ranch property located above Utah Highway 189 in section 12, T.5 S., R.3 E. and section 7, T.5 S., R.4 E., for geology hazards.

The property is located on boulder- to clay- size unconsolidated material in the Sulphur Springs Window of the "Deer Creek thrust fault zone" (see attached figure). The surface topography of the area slopes generally from the northwest (elevation 5800) to the southeast (elevation 5320). Although faulting has occurred in the area, no faults have been mapped or observed in the immediate vicinity although failure of Highway 189 has occurred in 5 locations adjacent to the property.

Due to the presence of unconsolidated material with very high percentages of silt and clay, in addition to the concentrated arrangement of one-half acre lots, each individual lot should have a percolation test performed at the exact location of the septic system drainfield, in the material below the elevation of the proposed drainfield. With such a high concentration of individual septic systems a "leachate plume" (concentrated mass of waste material) could form as a result of the breakdown of the soils and contaminate the perched water aquifer located in the "common area" noted on the plat map. It is common practice to recommend lots with a minimum area of one acre where there are marginal soil conditions to provide a comfortable factor of safety.

As is indicated on the plat map, no homes should be constructed in the designated "common area." Due to the presence of perched water and soils with an extremely high clay content, septic tank systems are not feasible.

The perched water in this area should be drained, eliminating the possibility of contamination from the septic systems installed at higher elevations. This would also reduce one of the potential

contributors of slippage on the Manning Canyon Shale and in turn reduce damage to Highway 189. Dr. J. L. Baer suggests that the draining of this area is being considered, but nowhere on the plat map are the planned wells located.

Dr. Baer also mentions that weathered portions of the Oquirrh Formation are stable, but his letter does not contain any engineering data to support this statement.

We do foresee a potential problem with development of the proposed golf course. Irrigation of the course could lead to perched water which could cause slippage on the Manning Canyon Shale.

If there are any questions or further problems, please contact us.

Yours truly,

BRUCE N. KALISER
Urban and Engineering Geologist

BK AK/af

Encl.

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August 14, 1978

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Mr. Robert Matthis
Wasatch County Planning Commission
Heber City, Utah

Dear Mr. Matthis:

At the request of Mr. John Gardner, I would like to inform you of my preliminary geologic findings on the property located along the Provo Canyon road in Wasatch County that Mr. Gardner and others would like to develop.

As you are aware, the two principal concerns with developing this property are slope stability and water related problems.

In respect to the former, the property is located mostly upon the Manning Canyon Shale. This formation is impervious for the most part and can be unstable when wet or put under extreme load at its unconfined perimeters. This instability is of particular note this year as there have been several slope failures along the canyon highway. This is indeed a serious problem. However, the stability of the Manning Canyon is proportional to the amount of water it contains. The reason the road had so many failures this year was the great amount of precipitation that fell in the winter of 1977 and spring of 1978. This water, largely in the configuration of groundwater, saturated the shale mass, thereby contributing to the slope failure.

Mr. Gardner and his associates have carefully considered this problem, as it concerns their property, and are contemplating utilizing relief wells and controlling the surface runoff from springs through a sprinkler irrigation system. This solution is both feasible and practical. By this means they will lower the groundwater table and most probably reduce the slope failure.

This solution will also assist in the other problems, namely, sewage and runoff waters. By utilizing and controlling the runoff from the springs and lowering the water table, the effluent from projected septic tanks would present less problem.

Although most of the development is on the Manning Canyon, the homes themselves are to be situated on weathered portions of the Oquirrh Formation and on thick soils. Therefore, the buildings do not present a problem in stability.

Mr. Robert Matthis

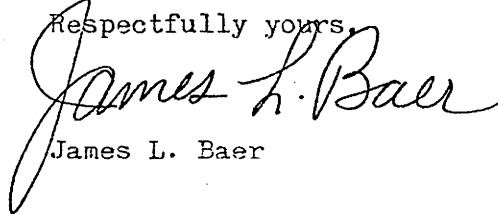
-2-

August 14, 1978

In summary, the major problems in developing the property have been considered and feasible solutions have been offered. This solution will not only solve the problems as they pertain to the property proper, but should assist in stabilizing the canyon highway.

I am personally inclined to be against most developments in the canyon. But the development as Mr. Gardner and his associates have outlined it would be an asset not only for Wasatch County but the environment of the canyon.

Respectfully yours,

A handwritten signature in cursive script that reads "James L. Baer". The signature is written in dark ink and is positioned below the typed name.

James L. Baer

JLB:rab