



May 5, 2022

Mr. Scott Weiss
108 Spencer Ave.
Sausalito, CA 94965

Email: Kirsten@wcm-sf.com

Subject: Preliminary On-site Wastewater Disposal Feasibility Analysis; 75 Horseshoe Hill Road, Bolinas, California; Marin APN 188-150-70

Dear Mr. and Mrs. Weiss:

This letter report presents a preliminary on-site wastewater disposal feasibility report for the subject property in Bolinas. We performed the preliminary site investigation on March 16, 2022 to determine if site conditions are suitable for a new septic system that can serve a main house, caretaker's unit and associated buildings for horses. It is our understanding that the existing septic system is not permitted. To develop the property a new septic system will need to meet all site requirements for on-site wastewater disposal.

Site Conditions

The property is approximately 6.6 acres in area. The property is bordered on all sides by large rural residential properties; all of the properties in this area of Bolinas are served by water wells for domestic water supply. We did not review the subject property's existing water well location during the site visit; no well permit was found from a County online records search. Only one neighboring well was observed close to the property line; at the far north corner of the property there appears to be a water well within 75 feet of the property at 125 Horseshoe Hill Road. There are no perennial drainages within 100 feet of the property. There is a group of buildings in the lower southwest corner of the property although there is no record of the buildings in the assessors report.

Generally the property slopes gently from north to south. At the top of the property is a very gently sloped (less than 5-percent) terrace. Downslope of the terrace area is a transition slope that slopes between 5-percent and 10-percent; the transition slope is approximately 75 feet wide and approximately 600 feet long running from northwest to southeast. Downslope of the transition slope is broad gently sloping (less than 5-percent) swale that characterizes the south half of the property. The central portion of the swale, especially in the south end of the property, appears prone to very wet winter conditions where surface soils may be saturated. This area may be

prone to seasonal wetland conditions. Soils in the more steeply sloped transition zone were investigated for wastewater disposal because this area can utilize groundwater intercept trenches because the slopes are greater than 5-percent. Areas less than 5-percent such as the upper terrace and lower swale cannot use groundwater intercept trenches to mitigate shallow seasonal groundwater conditions.

Soil Conditions

On March 16st, 2022 six soil profile holes, T1 through T6, were excavated along the transitional sloped area where slopes are steeper than 5-percent. The location of the holes is shown on the attached field map. Generally the soil profile consists of suitable silt loam topsoil and light density clay loam soil overlying stiff clay. The stiff clay was encountered at depths between 27 inches and 40 inches and in one location (T6) the stiff clay was encountered at 21 inches below grade. All of the soil profiles exhibited mottling (orange coloration) in the upper 2 feet of soil indicating the shallow soil becomes saturated during wet times of the year. The topsoil overlying the clay appears suitable for wastewater disposal; the underlying stiff clay is not suitable for wastewater disposal.

Groundwater Conditions

As mentioned above mottling (discolorations in the soil) was observed in all of the soil profiles, at depths less than 24 inches, indicating that the soils become saturated at this depth during wet times of the year. The seasonal occurrence of shallow groundwater is caused by the rain water perching on the stiff clay layer encountered between 21 and 40 inches. This shallow groundwater condition can be mitigated with an upslope groundwater intercept trench.

Conclusion and Recommendations

Based on the preliminary site investigation the property appears to have suitable site conditions for a mound system in the areas of soil profile trenches T1 through T5. Mound systems require suitable soils to be at least 24 inches deep. The area where T4 and T5 are located also show minimal soil depth (32 inches) to accommodate a subsurface drip disposal system. An upslope groundwater intercept trench, keyed into the stiff clay, will be necessary to divert shallow seasonal ground water away from the disposal area.

Based on soil textures a mound system for 6 bedrooms of wastewater flow (630 gallon per day (gpd)) will be approximately 75 feet long by 50 feet wide. A drip disposal field will need to occupy approximately 2,000 square feet or approximately 30 feet wide by 70 feet long. There is a total suitable area of approximately 450 feet long by 75 feet wide; consequently there is much more suitable area than needed. The best area will be the area that conflicts the least with proposed development. Both types of systems need to be fenced off from horses and would require a minimum buffer of 25 to 50 feet down slope and 5 to 10 feet on the other sides of the

disposal field. The subsurface drip system is a slightly smaller size but requires more maintenance and also requires a sophisticated pre-treatment system between the septic tank and the drip field. We would recommend the mound system as a more reliable design and slightly less expensive. The location of the system should be setback from buildings or grading especially on the downhill side. The soils at the site are shallow overlying stiff clays and the mound/drip systems depend on the soils maintaining an undisturbed condition in the areas downslope of the systems and directly adjacent. No subsurface drains can be located within 50 feet down slope of the disposal areas (i.e. foundation drains). The other setback issue is the tanks and disposal areas need to maintain a 100 foot setback from a new well and any wells on the neighbor's properties. An online search of well permits revealed no permits. During our site investigation we could see no obvious wells on the neighboring properties to the east and west except for the most northern area of the property where we saw a well for 125 Horseshoe Hill Road. There were well permits on file for 227 Horseshoe Hill Road the well is more than 100 feet from the subject property. Attached is the field map showing the testing locations and suitable disposal area.

The next steps would involve choosing the disposal area best suited for the planned development and then testing the site with the County Environmental Health to get their opinion that the site is suitable.

Please feel free to contact me with any questions at 510-236-6114 ext. 215 or ppospasil@questaec.com.

Sincerely



Paul Pospisil P.G.
Project Manager/Geologist

xc. M. Heacock, K. Walker
ref. 2100146 feasibility report

75 HH Rd

Field Map

3/16/22

P.P.

Upper Terrace

Scale
1" = 100' ±
0 100

Limits of Suitable Waste Water Disposal Area

Possible Seasonal Drainage

3%+ Slopes
OK 30' fat
Down on top
from holes

75 Horseshoe Hill Rd.
Test Location Map

