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November 29, 2011

Mr. Jake Kunstle
Mr. Bob Solberg
6 South Tejon, Suite 515
Colorado Springs, CO 80903

Re: Preliminary Ground Water Investigation, 185-Acre, Proposed, The Reserve At Corral Bluffs Development, El Paso County, Colorado.
Job No. 6731

Dear Jake and Bob:

At the request of your planner, Dave Jones, I have prepared this preliminary ground water report for your 185-acre property about two miles northwest of the Highway 94 and Curtis Road intersection. This irregular-shaped parcel spans a part of Section 32 and most of the Southeast Quarter of Section 31, Township 13 South, Range 64 West, as shown on Figure-1. I understand this property may be developed for 31, five acre single family homesites with individual Denver or Arapahoe aquifer wells for water supply. As proposed, the homes will be serviced with non-evaporative septic systems and leach fields for wastewater disposal.

For this investigation I have reviewed my files and those of the State Engineer for geologic, ground water and well information in this area. Geohydrologic information was obtained in part from the findings of the Colorado Ground Water Commission dated June 16, 2004. From this investigation I conclude that (1) a sufficient supply of ground water is contained in the Denver and/or the Arapahoe aquifer beneath the property to meet the 300-year water needs of this planned development, (2) the quality of the ground water in these aquifers should be adequate for domestic purposes and (3) permits to construct wells can be obtained pursuant to the Commission's findings in Case Nos. 516 and 517-BD.

GENERAL COMMENTS

The subject property is at a surface elevation of 6,700 feet above sea level. The grass-covered land surface slopes to the north and the parcel is drained by West Fork of Black Squirrel Creek. Although

Corral Bluffs occupy the southern property boundary, none of the proposed homesites are on these slopes that are part of the Arkansas River drainage system.

The property is underlain by three of the four of the Denver Basin aquifers. In descending stratigraphic order these aquifers are the Denver, Arapahoe and Laramie Fox Hills formations. The base of these respective aquifers should be 600, 1,100 and 1,800 feet below the ground surface. All of the aquifers are known to produce ground water and typically in this region wells should yield 10, 15 and 100 gallons per minute from the three respective aquifers. A domestic well yielding 5 to 10 gallons per minute is adequate for a single family home.

Ground water availability is computed by multiplying the property area times the formation sand thickness, thence by specific yield (drainable porosity). Based on the attached findings of the Colorado Ground Water Commission in Case Nos. 515, 516 and 517-BD (515-BD is not attached), I list on the table below estimates of ground water storage in each aquifer.

Aquifer		Sand Thickness (ft)	Aquifer Storage (af)
Denver	NNT	100	3150
Arapahoe	NNT	175	5510
Laramie Fox Hills	NNT	200	5110
Laramie Fox Hills	NT	200	450

The quality of the water produced from Denver and/or Arapahoe wells is normally adequate for drinking purposes. The mineral constituents in the water are all generally below drinking water standards. Iron is, however, commonly present in this ground water at concentrations slightly higher than the drinking standard, thus prospective home buyers should be advised iron treatment may be necessary. **Prior to final platting this project the County will require a quality analysis of water obtained from either an on-site well or one within ½-mile of the subject property.** You should obtain a listing of

minerals and compounds from the County and then sample the water from the existing well(s) for chemical testing.

WATER SUPPLY DEVELOPMENT

Ground water in all of the above described aquifers receives very little surface water recharge hence the water resource has been identified as "non-renewable." The El Paso County Commissioners, in the late 1980's, declared that developments using this water must demonstrate a 300-year supply in order to establish water supply sufficiency.

For this proposed development, the findings of the Commission would allow Denver aquifer well permits to be issued wherein each homeowner would use Denver ground water at a rate of up to 0.34 acre feet per year. The in-house use would be about 0.30 acre feet per year and the remaining water, as an example, would be sufficient for the irrigation of about 700± square feet of lawn/garden or the watering of three horses. The 31 homeowners, therefore, would need a 300-year water supply of 3,150± acre feet.

As the water use rate for the Denver aquifer is limiting you might want to consider platting the property with 21 lot owners tapping the Denver aquifer and the remaining parcel owners obtaining their water from the Arapahoe aquifer. Here, Denver well owners could use up to 0.5 acre feet per year which would allow about 3,500 square feet of irrigation or four horses and 2,700 square feet of lawn. The Arapahoe aquifer well users could, theoretically, claim an appropriation of 1.7 acre feet per year per home.

Individual Denver domestic wells normally are drilled for about $12 per foot. A 600-foot deep well would cost $7,200 plus about $3,000 for pumping equipment. A 1,000±-foot deep Arapahoe well probably would cost about $20,000 plus pumping equipment.

As shown on the above table both the Denver and Arapahoe aquifer ground water is not non-tributary (NNT). Since the property is more than one mile from the aquifer/alluvium contact, no formal replacement plan is required, only that four percent of the water pumped is released to shallow sandy soils. The four percent requirement equates to 0.02 acre feet per year (6,500 gallons) which can be easily

met with septic system return flows which normally would be about 0.27 acre feet per year per home. If for some reason non-evaporative septic systems cannot be constructed in the development, the four percent obligation can be met with lawn irrigation return flows. If 2,700 square foot lawns were to be irrigated, about 15 percent of the irrigation application of 2.5 acre feet per year per acre should return to the shallow overburden soils at a rate of about 0.02 acre feet per year.

On the following table I summarize the needed water supply for this proposed development.

	No. of Units	Gallons per Day	Acre Feet per Year
Homes	31	8306	9.3
Irrigation	83700 sq-ft	4296	4.81
Livestock	124 head	1241	1.39
Total		13843	15.5

RECOMMENDATIONS

(1) In platting the property care should be exercised to make sure individual wells can be spaced 400± feet apart to avoid mutual well interference.

(2) When the platting process approaches a final plat, obtain a water sample from an existing well within ½-mile of the development so that a water quality analysis from the Denver and Arapahoe aquifer can be obtained.

Professional judgments have been expressed in this report. They are based on my understanding of the project requirements and my experience with the aquifers in this area. Well construction and testing will be necessary to verify my preliminary conclusions on well yield and water quality.

I trust this information satisfies your immediate needs. If you have questions, please call.

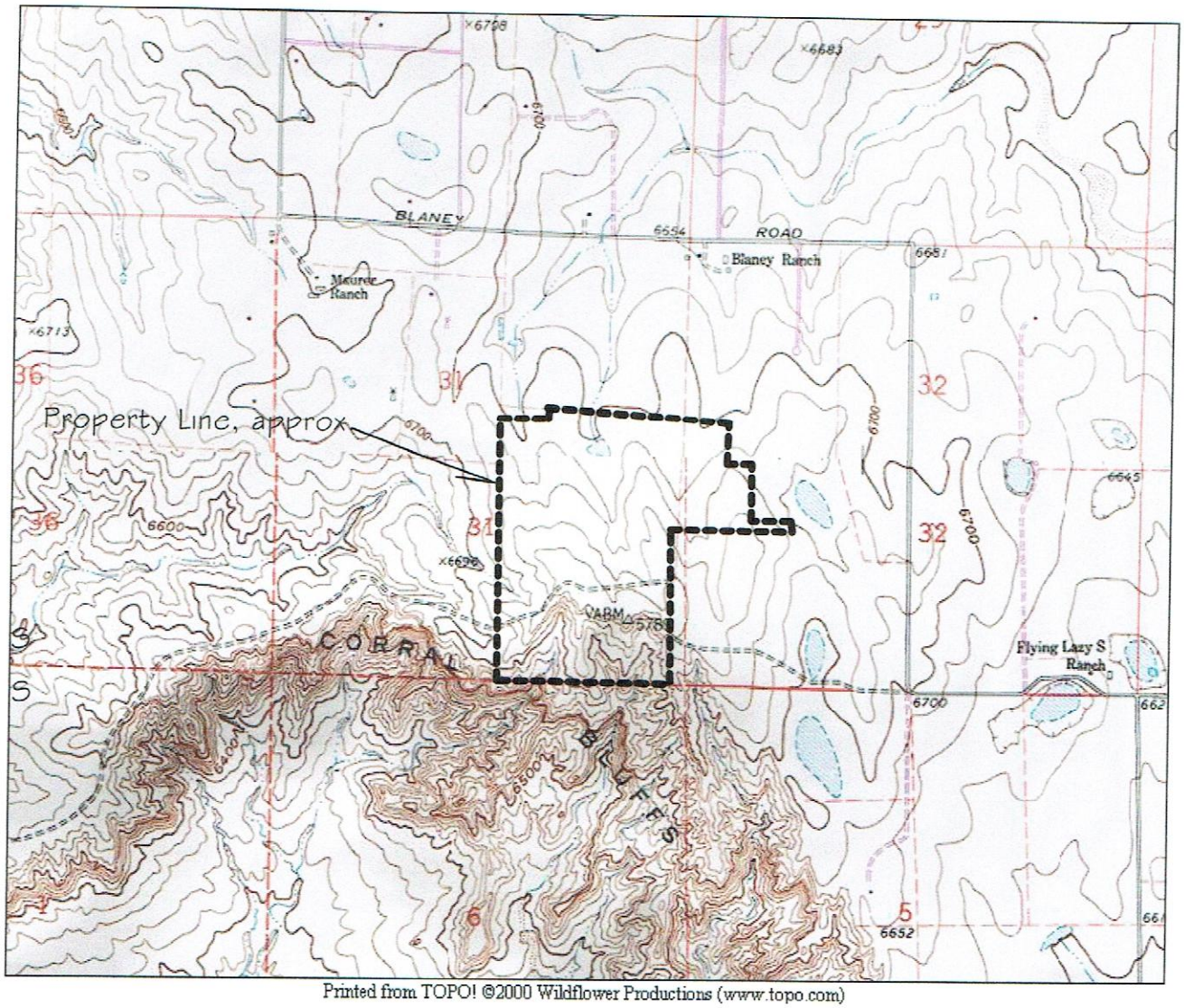
Very truly yours,

Wm. Curtis Wells & Co.

Wm. Curtis Wells, CPG
Consulting Ground Water Geologist

cc: Dave Jones

R 65 W R 64 W



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Scale 1" = 2000'

Location Map

The Reserve At Corral Bluffs

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Figure 1