MINUTES OF THE

SANTA FE COUNTY

DEVELOPMENT REVIEW COMMITTEE

Santa Fe, New Mexico

July 16, 2009

This regularly scheduled meeting of the Santa Fe County Development Review Committee (CDRC) was called to order by Chair Jon Paul Romero, on the above-cited date at approximately 4:05 p.m. at the Santa Fe County Commission Chambers, Santa Fe, New Mexico.

Roll call preceded the Pledge of Allegiance and indicated the presence of a quorum as follows:

Members Present:
Jon Paul Romero, Chairman
Susan Martin, Vice Chair [late arrival]
Jim Salazar
Don Dayton
Juan José Gonzales
Charlie Gonzales
Maria DeAnda

Member(s) Excused:
None

Staff Present:
Wayne Dalton, Planning Division Supervisor
Rachel Brown, Deputy County Attorney
Vicki Lucero, Residential Development Review Specialist
John Michael Salazar, Development Review Specialist
Laurie Treviso, Water Specialist
Steve Ross, County Attorney [6:00 arrival]
Penny Ellis-Green, Deputy County Manager [6:00 arrival]
Robert Griego, Senior Planner [6:00 arrival]

Also Present:
Robert Freilich [6:00 arrival]
Bruce Peshoff [6:00 arrival]
Robert Burchell [6:00 arrival]

APPROVAL OF AGENDA

Chairman Romero asked that cases #2 through #5 be heard before the presentation on Chapters 1 through 5 of the SLDC in order to accommodate the applicants and participants.

Member Dayton moved to approve the agenda as amended and Member Salazar seconded. The motion carried unanimously. [Member Martin was not present for this action.]

IV. APPROVAL OF MINUTES: June 18, 2009

Member C. Gonzales noted that on page 21, the sentence should read "He thanked the applicant for not asking for a variance to ~~strip~~ disturb 30 percent slopes."

Member Salazar moved approval with the change and Member C. Gonzales seconded. The motion passed by unanimous 6-0 voice vote. [Member Martin was not present for this action.]

V. NEW BUSINESS

2. CDRC CASE #S 08-5210 Sandstone Pines Estates Preliminary and Final Plat/Development Plan. Anasazi MV JV LLC, applicant, Melvin Varela, agent, request preliminary and final plat and development plan approval for a 12-lot residential subdivision on 42.99 acres. The property is located in Glorieta, North of I-25, South of State Road 50, within Sections 1 and 2, Township 15 North, Range 11 East (Commission District 4)

Ms. Lucero read the case caption and gave the staff report as follows:

"The applicant requests preliminary and final development plan and plat approval for a twelve-lot residential subdivision on 42.99 acres. The proposed lots range in size from 1.21 acres to 12.17 acres. The property is located within the homestead hydrologic zone where the minimum lot size is 40 acres per dwelling unit with a 0.25 acre foot per year per lot water restriction, unless an approved geohydrologic analysis demonstrates water availability to support increased density. The applicant has submitted a geohydrologic report which demonstrates sufficient water availability for the development."

Ms. Lucero stated the application was reviewed for access and traffic impact, terrain management and water harvesting, water and liquid waste, solid waste, fire protection, landscaping, open space, archeology, signage and affordable housing.

She gave the recommendation as follows: The proposed subdivision is in compliance with Article V, Section 5.3 (Preliminary Plat Procedures), Article V, Section 5.4 (Final Plat Procedures), and Article V, Section 7 (Development Plan Requirements) of the Land Development Code. Therefore, staff recommends preliminary and final plat and development plan approval subject to the following conditions:

1. Compliance with applicable review comments from the following:
    a. State Engineer
    b. State Environment Department
    c. State Department of Transportation
    d. County Water Resources Specialist
    e. County Public Works
    f. County Fire Marshal
    g. County Building and Development Services Division
    h. Santa Fe Public School District
    i. State Historic Preservation Office
    j. Rural Addressing
    k. County Affordable Housing Administrator
2. The final development plan and plat must be recorded with the County Clerk's office.
3. All redlines will be addressed, original redlines will be returned with final plans.
4. The development shall comply with the water harvesting requirements of Ordinance 2003-6. A rainwater-harvesting plan will be required from individual lot owner upon application for a building permit. This requirement must be included in the Subdivision Disclosure Statement and restrictive covenants, and noted on the final plat.
5. A liquid waste permit must be obtained from the Environment Department for the proposed septic systems prior to issuance of building permits; this requirement must be included in the Subdivision Disclosure Statement and noted on the plat.
6. The applicant must record water restrictive covenants simultaneously with the Plat imposing 0.25-acre feet per lot per year. Water meters must be installed to each lot at the time of development and meter readings must be submitted to the Land Use Administrator annually by January 31st of each year.
7. The Applicant shall provide a Vegetation Management Plan to be reviewed and approved by the County Fire Marshal and must be recorded with the Final Development Plan and referenced on the Final Plat.
8. A location for a future cluster mailbox area to serve the Apache Springs Subdivision and other areas must be provided. This pullout shall meet the minimum specifications for mailbox pullouts set forth by the NMDOT. The pullout driving surface shall be a minimum of 6" of aggregate basecourse, and adequate drainage must be provided. The detail of this location shall be included in the Final Development Plan, and additional right-of-way as required indicated on the Final Plat.
9. The applicant shall submit a financial guarantee, as required by Article V, Section 9.9 of the Code, in a sufficient amount to assure completion of all required improvements. The financial guarantee shall be based on a county approved engineering cost estimate for the completion of required improvements as

approved by staff prior to final plat recordation. All improvements shall be installed and ready for acceptance within eighteen months of recordation.

10. The applicant will be required to provide a Landscaping Plan for revegetation of disturbed areas, prior to Final Plat recordation.
11. All utilities shall be underground. This shall be noted on the plat, covenants and disclosure statement.
12. The standard County water restrictions, final homeowner's documents, and disclosure statement must be recorded with the final plat.
13. Any subdivision signage will require a Sign Permit, and all signage must meet the requirements of the Code.
14. Driveways shall not exceed 11% grade.
15. Provide a calculation on lowest practical pumping levels and 100-year schedule of effects for well UP-04251 as specified in Article VII, Section 6.4.2c and d of the County Code prior to final plat recordation.
16. Provide water quality test analysis for well UP-04251 as required in Article VII, Section 6.5.2 of the County Code prior to Final Plat recordation.

Ms. Lucero noted that a letter of opposition was handed out. *[Exhibit 1]*

Duly sworn, Melvin Varela, applicant indicated there was a need in the area for the subdivision and the lots are larger than the Code requires. There are two affordable lots. He said water has been proven by two wells. The houses would not be seen from the next lot. The property lends itself to solar gain and they would like to incorporate green elements.

Chairman Romero asked if public meetings were held with the neighbors, and Mr. Varela said they were not.

Maria Varela, under oath, pointed out that the State Engineer has notified residents in the area of radon contamination in the wells and she asked if the wells on the property in question had been tested and whether there is a plan in place.

Ms. Lucero said water quality analysis is one of the conditions of approval.

Andy Dalmy, duly sworn, said he is a resident of Glorieta and is in opposition to the project. He said this is the second time the property is up for approval; the first was in 2004. He has 40 acres abutting the proposal. Mr. Dalmy engaged the services of a hydrologist, who found there could be adverse impacts to adjoining wells. The conclusion of the County Hydrologist in 2004 was that there was not sufficient water and the application was denied.

Under oath, hydrologist Steven Taylor Finch, Jr. said he'd had only a brief amount of time to review the material, but stated he found impairment and that the aquifer would not sustain a subdivision. He said the new well was drilled deeper but has not been tested. The previous report by Glorieta Geoscience stated that the lower formations are dry, therefore he is concerned about the accuracy of the calculations. He

said it was in the best interests of the County to get additional information and prove there would be no adverse impacts.

Leonard Gomez, from a nearby property and duly sworn, indicated there have been numerous problems with their well, which sits in the path of the drainage from the proposed site. Electrical equipment has also been affected. He agrees with Mr. Dalmy and does not trust the drainage situation.

The hydrologist for Mr. Varela, Patrick Romero, was placed under oath and noted that conditions have changed since the previous application and the lots are now larger. The second well was drilled to increase the saturated thickness in the calculation. Using Dr. Finch's numbers he was able to come up with a greater density than they are requesting. Modeling showed a four to five-foot draw-down after 100 years. He said he was very conservative in his calculations. He speculated that the problems experienced by the previous speaker were due to a construction issue rather than an aquifer issue. He said Mr. Varela had an easement over that property and rather than use that they have created a new road into the subdivision.

Member deAnda asked about condition #4 on water harvesting requirements. She asked if yield per household could be predicted. Mr. Romero said yield depends on size of the building square footage and rainfall. Member deAnda asked how the restrictive covenants on water usage would be enforced. Mr. Romero said that would be up to the homeowners association. He said typical usage is .2 afy since people are now too busy to plant gardens.

Member J.J. Gonzales asked Laurie Treviso about the comment in her report, "It is the policy of Santa Fe County not to revisit or re-interpret previous staff recommendations." Her report seems to say there is not sufficient water availability. Ms. Treviso stated usually recommendations aren't changed but in this case the master plan had changed, and the new well was subject to review. Member J.J. Gonzales asked how it was possible to say a proposed well could have sufficient water. Ms. Treviso said typically they extrapolate information based on nearby wells. She said the geology is complex.

Chairman Romero asked about the State Engineer's report and Ms. Treviso said they gave a positive opinion except regarding quality.

Member Martin asked if rainwater harvesting only applied to homes over 2500 square feet and Ms. Treviso said that was true. In this case water harvesting will be required of homes with 2500 square feet, heated or not.

Member deAnda asked for further amplification on the aquifer conditions. Ms. Treviso said aquifer thicknesses in the area vary and it's hard to speculate whether or not they are connected. She stressed hydrology was an inexact science.

Providing some history, Ms. Lucero clarified that the original application requested 19 lots on 55 acres, which included five lots that were created at that time. They are now requesting 12 which will make a total of 17.

Member deAnda asked if the water quantity had changed. Mr. Romero stated both the amount and the usage have changed. Two of the three wells have been drilled. Ms. Treviso stated the total required for the previous application was five acre-feet, and the new water supply is 3.25 acre-feet.

Referring to the packet, Member C. Gonzales said there appears to be a plan to vacate an existing cul-de-sac, and he asked if that would be revegetated. Mr. Varela said the cul-de-sac will be maintained for fire protection. He said they are vacating use of it for themselves, not for the existing residences. Mr. Romero said the roadway was changed in order to avoid impacting some of the lots.

Member C. Gonzales asked about the affordable housing, and Mr. Varela said it will resemble the other housing in the area; they are not mobile or modular homes.

Member C. Gonzales asked that staff review to the potential drainage issues, and Mr. Dalton said he would make sure that happens.

Member Dayton asked Dr. Finch for a rebuttal. Dr. Finch said there has been no change to the review as done by Dr. Wust, except the well log. He said the pumping tests done in the past show the sandstones were of limited extent. He said that Mr. Romero assumed the aquifer extends across the entire property. He reiterated that the new well has not been tested for water quantity. "He took the thickness from that new well and then used the testing from the old wells..."

Mr. Varela said in the previous application, Ms. Kingsmill drilled to 500 feet but should have gone deeper to ascertain the saturated thickness. Mr. Romero reiterated that his model showed an impact of only five or six feet decline in the water level. He repeated that he used Dr. Finch's numbers for the saturated thickness. The well log showed that the lower units were water-producing. The first pump test showed a bit of a lens but the second test showed no boundary.

Chairman Romero asked staff if all submittals were done in conformance with County rules. Ms. Lucero said they were.

Member J.J. Gonzales moved to deny CDRC Case #S 08-5210. Member C. Gonzales seconded and the motion to deny passed unanimously.

3. **CDRC Case # LDDL 09-5190 Sutton Legal Lot Recognition.**

Mr. Dalton stated that with the applicant's agreement, staff recommends tabling this case since the applicant has submitted additional documentation.

4. **CDRC CASE # MIS 09-5220/APP 09-5221 Libby Pattishall Accessory Structure. Libby Pattishall, applicant, is requesting an appeal of the Land Use Administrator's decision to deny an application for an accessory structure totaling 9,100 square feet for the purpose of a riding arena without a dwelling unit on 10.04 acres. The property is located at 8 Camino del Gallo within Section 28, Township 15 North, Range 10 East (Commission District 5)** *[Exhibit 2: Letters of Support and Opposition]*

Mr. J.M. Salazar read the caption and gave the following staff report:

"On March 11, 1997, the Board of County Commissioners adopted Ordinance No. 1997-4 which states that the CDRC is required to review for approval any accessory structure which is greater than 2,000 square feet. The Santa Fe County Land Use Administrator denied this application on June 3, 2009 stating that a dwelling unit must be located on the property in order to apply for an accessory structure permit. Ordinance No. 1997-4, Article X, Section 1 defines an accessory structure as incidental and subordinate to the principal use or structure. The subject property currently includes a 3,192 square foot barn which was permitted through CDRC approval in 1999.

"The applicant is requesting to construct a 9,100 square foot indoor riding arena on 10.04 acres with a proposed height of 20'. The applicant currently resides on Lot 5-N located to the south of the subject property. The property is located at 8 Camino del Gallo via Camino Polvo, north of Lamy. The area is rural residential with slopes below 15%. There are no floodplain issues, and the site has all weather emergency access.

"The applicant states the riding arena 'will be for residential use only, family and friends.'"

Mr. J.M. Salazar stated staff recommends denial of the appeal and denial of the request for an accessory structure greater than 2000 square feet as it is in violation of Ordinance No. 1997-4, Article X, Section 1. The subject property does not contain a principal structure besides the barn. Should the CDRC decide to approve this application, staff recommends the following conditions of approval:

1. The applicant must comply with all other Santa Fe County and CID building permit requirements.
2. Compliance with minimum standards for Terrain Management as per the Environmental Requirements of the Land Development Code.
3. The structure shall not be utilized for commercial use.

Duly sworn, Libby Pattishall indicated she disagreed with the denial based on the fact that the CDRC approved the request for the barn, an accessory structure, which is on

the same lot, which lacks a principal residence. Prior approval was obtained from the homeowners association and all other criteria have been met.

Member C. Gonzales asked how many accessory structures are allowed on a property. Mr. Dalton said there is no set limit. Only the first can have plumbing; later structures cannot.

Member deAnda asked why the applicant could not combine the lots. Mr. Dalton said that was up to the applicant. Ms. Pattishall indicated that a previous staff member had discouraged her from seeking a consolidation but she wasn't sure of the reason.

Chairman Romero asked if this could be done administratively if the lots were consolidated. Mr. Dalton said the CDRC would have to approve it because it is over 2,000 square feet, but staff's recommendation would be for approval.

Ms. Pattishall stated she would have to look into the details before undertaking a consolidation or a lot line adjustment. She speculated there could be concerns about water or the homeowners association.

Mr. Dalton said staff could meet with the applicant to discuss options.

Chairman Romero moved to table CDRC Case #MIS 09-5220. Member Dayton seconded and the case was tabled without opposition.

5. **CDRC CASE #MIS 09-5260 Richard Montoya Legal Lot Recognition. Richard Montoya, applicant, is requesting recognition of a 0.396 acre lot. The property is located #6 Mi Tierra which is off County Road 76 in Cuarteles, within Section 2, Township 20 North, Range 9 East (Commission District 1)** *[Exhibit 3: Material in Opposition]*

Mr. J.M. Salazar gave the following staff report:

"The applicant does not have a notarized pre-1981 deed or plat to prove legal lot of record. Either one is necessary for the Land Use Administrator to recognize a pre-code legal lot of record. Article II, Section 4, subsection 4.4.2 of the County states, 'If the applicant has evidence which does not include a notarized document, the evidence shall be submitted to the appropriate Development Review Committee. The Development Review Committee shall determine if the evidence establishes the existence of the lot prior to the effective date of the Code.' Thus, the CDRC may recognize non-notarized deeds or plats as proof of legal lot.

"The applicant has submitted a deed that was notarized on October 10, 1986. The deed does not contain descriptive USGS quadrant quarters to describe the lot. The Applicant has provided staff with a letter signed by nine family members stating

that the intent of his father was to provide a piece of property to his then new-born daughter in 1978.

"On June 29, 2009, the Santa Fe County Land Use Administrator denied the Applicant's daughter her request for placing a dwelling on the 0.396 acre lot stating, "The earliest deed conveying the 0.396-acre parcel was not recorded until 1994, 6-years after the platted tracts were created, therefore, this parcel cannot be recognized as 'Legal Lot of Record' as defined by Article X, Section 1.71 of the Santa Fe County Land Development Code."

Mr. J.M. Salazar noted that Mr. Montoya has been paying taxes on the property.

Staff recommends the following: A survey plat was taken of the lot and surrounding properties dated April 12, 1988 which does not show the 0.396 acre lot therefore staff recommends denial of this request. There is no documentation to prove that the lot was created before 1981 either through a description on a notarized deed or illustrated on a survey plat.

Chairman Romero asked if the applicant had provided records from the utility companies or NMDOT. Mr. J.M. Salazar noted the land was vacant and had no improvements, however, it is in the County system for tax purposes.

Member deAnda noted the only tax bill presented was from 2007. Mr. J.M. Salazar said there are tax records from as early as 1994.

Duly sworn, Richard Montoya, Sr. stated that his ancestors have lived on the property for hundreds of years. As his father grew older he started dividing the land and giving pieces to his children. He explained that he complied with all the notice requirements. He indicated he himself received the land he currently lives on when he was 14 years old. When Mr. Montoya's daughter was born his father said, "This piece of property will belong to Melissa someday." He said he brought a warranty deed and notarized letters from his siblings attesting to his intent to give the land to his granddaughter.

In addition to the warranty deed, Mr. Montoya gave the CDRC pictures of posts indicating the property boundaries. He stated there is currently sufficient well water and community water is coming in the next couple months.

Member C. Gonzales asked for clarification of where the lot is on the survey plat. Mr. Montoya said the lot is one property past the Acequia de los Fresquez. Mr. Dalton said it is north of Tract A.

After distributing information packets *[Exhibit 3],* Juan D. Cordova, Jr., under oath stated the plat submitted is not for the property in question, rather it is the plat south of it. He said he has property to the west and to the south, and he was concerned this lot recognition would impact his properties. He requested a tabling to allow for a property

survey to be done. He said he has a restraining order against Mr. Montoya, a family member, due to a dispute over property lines.

Member deAnda asked for clarification about the plat. Mr. Cordova said the property in question is not on the plat in the packet Exhibit D. He said he did a sketch showing the relative locations of the properties north of the ditch. Member deAnda asked if the submitted warranty deed described the property in question. Mr. Cordova said it did more or less, and he was not disputing that the property was deeded to Mr. Montoya. He added he was not concerned that a house be placed on the property but rather about the exact locations of the boundaries.

Duly sworn, Melissa Montoya said this is her inheritance. She got her PhD in Arizona and wants to move back and build a home on the property. She anticipated her home will increase the property values of the area. She doesn't have the money to purchase another piece of land. She said a survey will be done once the legal lot is approved and she will be able to sign a contract with a contractor.

Chairman Romero asked if requiring a survey as a condition of approval would be acceptable. Ms. Montoya said it would.

Member deAnda pointed out that the earliest warranty deed is from 1986, which is after the Code was in place. Mr. Montoya said in the old days things were done verbally and years passed before the transfer was done in a legal manner.

Member C. Gonzales asked if approval by exclusion was done, and Mr. J.M. Salazar said it was.

Member Salazar asked if being on the tax roles constitutes proof. Ms. Brown said the Code says being on the tax roles is insufficient evidence.

Mr. Montoya presented the committee with pictures of his nephew Mr. Cordova's property and said septic tanks from the trailers are seeping onto his property.

Member deAnda asked what options there were for conveying the property. Noting she would have to review the deeds, Ms. Brown said the evidence submitted in the packet is not what the Code requires in making a determination about the legitimacy of the lot. Staff advises that the lot is not developable in its current state, but at this time she can't speculate on what options are open.

Member C. Gonzales moved to table Case #MIS 09-5260 pending a survey. Member Dayton seconded. The motion carried without opposition.

Chairman Romero advised the applicant that the case was neither approved nor denied and a boundary survey and title search will help make a decision.

[The CDRC recessed from 5:45 to 6:00.]

1. Chapters 1 through 5 of the Land Development Code Rewrite

Chairman Romero said there would be a summary by Mr. Ross and Dr. Freilich, to be followed by public comment.

Mr. Ross indicated two lengthy workshops have just been completed on the first five chapters of the Sustainable Land Development Code (SLDC). He said now is a good time to do some listening to see what people think. Dr. Freilich has made a number of revisions to the original code that will appear on website soon, and he will announce some new changes tonight. Another public hearing on the code will be held in August at the regular or a special meeting. The team is working on the next seven chapters, and he anticipated a "busy fall".

Chairman Romero thanked staff and the consultants for the study sessions, which were very enlightening. He thanked them for meeting with the development community and other stakeholders outside of the hearings.

Dr. Freilich said he preferred to hear the public input prior to introducing the latest changes.

Speaking from the public Attorney Rosanna Vazquez said she would be putting her remarks in writing, but wanted to speak as the representative of a group of stakeholders who have been meeting with staff and the consultants. She said they are very, very happy for the process and grateful to everyone for listening to their comments, concerns and frustrations. Recognizing change is hard, she thanked everyone involved on behalf of Rancho Viejo and others.

Warren Thompson stated he was originally daunted by the prospect of going through another community plan after going through those of La Cienega, the Community College District and San Marcos, but it's "something the County needs to do." He said it will take a lot of work to get a balanced document but he is supportive and grateful.

Johnny Micou from Drilling Santa Fe and the United Communities of Santa Fe County, said the UCSFC believes the first five chapters should be forwarded to the BCC for processing, along with additional public hearings and workshops. He added it should be understood that additional changes or amendments can be made to draft until the entire General Plan and SLDC are finally adopted.

Also expressing appreciation was David Gold, who mentioned specific concerns. Regarding trails and open space, in Chapter 5 a number of reports are required but there seems to be no requirement for a comprehensive review of trails and open space. He described this as a complicated issue. Typical questions would be: how many miles of trails and open space will be required per area of development? What about buffering? Interconnectivity? These issues should not be left vague. Traffic impact is another concern. For instance, what triggers an interchange on 599? It's important to consider

cumulative effects, and who pays? This is not clearly spelled out. Regarding Section 5.8, the water availability report, sustainability should be the byword, rather than the current depletion model. "A larger, global planning has to take place."

Speaking to trails, Dr. Freilich said trails will be handled in Chapter 10, which will be ready by September 15. Financing, impact fee structure and an official map will be included, which will demonstrate present and future trails, parks, recreation, scenic vistas – anything requiring preservation. They will be recommending a countywide open space assessment district. He said there will be a comprehensive solution.

Regarding intersection improvements where there are cumulative impacts, Dr. Freilich said new developers can't be required to pay for existing deficiencies, but development can be denied. The County can designate critical intersections which will have a designated level of service. Developers will be required to pay their share through impact fees. A number of financial resources will be brought to bear on critical intersections.

Mr. Gold suggested that there should be something in reference to these issues amid the submittal section of Chapter 5. Dr. Freilich said that seemed reasonable and they would go over that.

Dr. Freilich agreed that sustainability was the goal, and Chapter 9 will have a section entitled Sustainable Design and Improvement Standards which will inform the studies, reports and assessments. The County policy is to use surface water wherever possible rather than deplete groundwater. Rainwater catchment will figure prominently, as will better stormwater management.

Chairman Romero thanked Mr. Gold for his valued input.

Cerrillos resident Ross Lockridge asked for some clarifications on the matter of expansion of non-residential uses. Where does it say that expansion of non-residential or non-conforming uses require a public notice? He was concerned this could be done administratively. He was particularly worried that mining areas could be increased. He understood the oil and gas ordinance was being incorporated in its entirety and he suggested the same be done for a hard rock mining ordinance.

Mr. Lockridge referred to consolidations/new subdivisions that have taken place in Cerrillos without public notice. He hoped the CDRC would recommend a first reading for the BCC with the public still being allowed to make amendments.

Linda Spear, resident and representative of Arroyo Hondo, said Arroyo Hondo is interested in becoming a Community Planning Organization (CPO) and participating in the growth management process. She urged that this process begin as soon as possible. She read the mission statement of the Arroyo Hondo Land Trust. She thanked the committee for trying to preserve open space while allowing growth, and she supported forwarding the document with the proviso that additional language and amendments are possible. She urged the control of sprawl.

Dr. Freilich said he early explained to CPO members that the extension of non-conforming uses will not necessarily apply to mining due to the Diminishing Asset Doctrine of the State of New Mexico. This says the owner is allowed to continue mining its assets; but he will review Section 3.23.7.3. Mining will be in Chapter 6 and in addition to oil and gas it will have provisions on mining, rock excavation, quarries, and major grading. Wrecking yards may also be covered.

He said he would look into the consolidation issue and the case referred to by Mr. Lockridge.

Jeanette Yardman, PNM, stated she downloaded the plan but was unable to get the Definitions section. She asked specifically for the definition of "structures". Dr. Freilich said it was very complicated and included man-made things above and below ground. He noted the Definition section is complete and comes to 125 pages. Mr. Ross said they were uploaded a few days ago and should be available now, along with the latest changes made. Dr. Freilich said a list of acronyms will also be made available.

Ann Murray from Cerrillos expressed a concern about gravel mines, which currently is classified as a special use. She asked what was proposed for that use. Dr. Freilich said everything that removes minerals will require an overlay district classification which will entail a number of studies. Ms. Murray requested that the boundaries be GPS to prevent spontaneous growth of mining areas. She said traffic is also a concern.

Dr. Freilich pointed out lack of funding in the Growth Management Department has been an ongoing problem in enforcement and monitoring. Benchmarks will be established and inspections made. Trucks entering and leaving mining sites will be recorded. Ms. Murray supported forwarding the document to the BCC.

Member Martin reiterated the importance of including gravel mines since the New Mexico Mining Act excludes them, so control defaults to the County.

Member C. Gonzales said he felt the Code rewrite was long overdue, and having worked at the County he appreciated the need. He said the attitude often was, "It's much easier to ask for forgiveness than permission." He applauded the concept of the CPOs, which should make things more consistent.

Member C. Gonzales asked if existing department policies had been incorporated. Mr. Ross said consultants have been meeting with staff to that end. Many were added to the Duncan plan. Most of the policies pertain to zoning. Member C. Gonzales asked if the changes contemplated would change the interactions with CID, NMED or other agencies. Mr. Ross said they couldn't change state law, although there is a move afoot for the County to take over building inspections. Member C. Gonzales observed that the new Code seemed to put a greater burden on staff which could affect turnaround time commitments. He asked if more staff would be hired.

Dr. Freilich indicated the plan would have an actions section. Dr. Burchell is looking into the financial side.

Member C. Gonzales asked if the CDRC could form subcommittees, and Dr. Freilich said he would include that authority in the document. Member C. Gonzales asked if the BCC would still have the power to revoke permits. Dr. Freilich said there will be a section on revocations, and they will be beefed up. Member C. Gonzales asked about blasting permits, and Dr. Freilich stated blasting cannot be done without notification to the County. That will be included under mining and under oil and gas.

Member Dayton asked if there had been any discussions about a regional water authority. Mr. Ross said this has not been done in a formal sense, but the Buckman Direct Diversion Board is a joint City-County project. Potential regionalization is occurring in Eldorado, Edgewood, Cuatro Villas, Chimayo and the Aamodt area. These "could coalesce in the future." Dr. Freilich noted that since private utilities are difficult there is a trend toward special districts. These public districts will afford easier consolidation.

Chairman Romero thanked staff for selecting the consultants to work on the code rewrite. Great strides have been made in addressing the community's issues and in involving more people. He made the following motion:

- First, that Chapters One to Five of the proposed SLDC, consisting of the June 9, 2009 draft of Chapters One through Five forwarded to the CDRC by the Board of County Commissioners, together with the amendments made by Dr. Freilich for hearing tonight, be set for a public hearing on August 20, 2009 at 4:00 p.m.
- Second, that any additional changes and amendments from the public be sent to Dr. Freilich no later than August 14, 2009 so that a final text of Chapters One to Five can be the subject of the August 20, 2009 public hearing
- Third, that the CDRC recommend to the Board of County Commissioners that the CDRC finally approved text of Chapters One through Five be approved by the Board as a first reading of an ordinance, with the understanding that additional changes can be made to Chapters One through Five until final adoption of the entire General Plan and SLDC by the Board of County Commissioners.

Member Martin seconded and the motion passed by unanimous 7-0 voice vote.

The chair thanked everyone for their participation.

Dr. Freilich asked that the members of the CDRC check their calendars for possible dates to review the remaining chapters. He outlined upcoming features that will be reviewed and highlighted a proposal for a housing code whereby existing structures will be regularly inspected. Additionally, they will be proposing a redevelopment chapter that will consolidate the narrow strips of land in Agua Fria.

VI. PETITIONS FROM THE FLOOR

Linda Spear asked for clarification on creating a public district. Dr. Freilich said he was referring to districts created by a developer on vacant land.

VII. COMMUNICATIONS FROM THE COMMITTEE

Member C. Gonzales said he would like to see a change in the Code that would allow accessory structures on an otherwise vacant land. Dr. Freilich said they have made changes so that a number of structures do not require SRAs. He added the number of variance requests should diminish considerably. He reminded the committee that they will have the ability to initiate amendments and legislation. He commended the committee for their work and rational decision making and thanked them for their tremendous support and help.

VIII. COMMUNICATIONS FROM THE ATTORNEY

None were offered.

IX. MATTERS FROM LAND USE FROM STAFF

B. Next Meeting: August 20, 2009

X. ADJOURNMENT

Having completed the agenda and with no further business to come before this Committee, Chairman Romero declared this meeting adjourned at approximately 7:15 p.m.

Approved by:

Jon Paul Romero, Chair
CDRC

ATTEST TO:

COUNTY CLERK

Before me, this ____ day of _____, 2009.

My Commission Expires: _____
Notary Public

Submitted by:

Debbie Doyle, Wordswork

[redacted]

CDRC Case #S 08-5210 Sandstone Pines
CDRC Meeting July 16, 2009

Dear CDRC Members:

I am writing to voice my opposition to the proposed subdivision referenced above and ask that the CDRC deny the request for the proposed subdivision. This is the second time a subdivision has been proposed for this plot of land. A similar subdivision was proposed in 2003and subsequently denied by the County, the CDRC and the County Commission in 2004. The case was # S 03-5920 "Los Animas Subdivision". I assume the history of this case was provided to the CDRC members, but I have included some of it here in case it was not.

This case was heard by the CDRC in March 2004. I got involved because the proposed subdivision borders my property and the wells on the property were within a few hundred feet of my well and several other existing wells in the neighborhood. Because I and my neighbors were worried about how this proposed subdivision would impact our water supply, I retained the services of hydrologist, Stephen Finch, of John Schumaker & Associates, to review and evaluate the hydrological data submitted by the applicant. His evaluation was that there was an inadequate water supply, that the proposed subdivision could adversely impact existing wells in the area, and that the proposed subdivision wells would not be able to sustain a long-term water supply. Based on this analysis, the CDRC gave the project only a preliminary approval, subject to the re-evaluation of the submitted hydrological data by the county hydrologist, Dr Stephen Wust. Upon further testing, recommended by Dr. Wust, and further evaluations, including research into the geology and hydrology of the area and consultations with other hydrologists, Dr. Wust reversed his previous evaluation and agreed with Mr. Finch's evaluation.

His conclusion was that the water in this area is isolated to thin sandstone beds which occur in pockets that are not continuously connected. He consulted with other hydrologists including a hydrologist from another state to obtain a neutral opinion. This hydrologist indicated that without a very sophisticated pump test the assumption would be that the sands don't connect until demonstrated otherwise. Dr. Wust's written opinion was that this is not a sustainable aquifer.

This property lies between the Mountain and Homestead Hydrological zones and the required minimum lot size is 20 to 40 acres. This requirement isn't just an arbitrary determination. It was born out of sound geological/hydrological studies about the nature of water in these types of mountain areas, based on the reality that there is limited water availability in these areas.

In his report of May 15, 2004, Mr. Finch stated that the data submitted on behalf of the proposed subdivision failed to demonstrate that there was no significant drawdown in the aquifer in surrounding properties and recommended that based on available data and his calculations minimum lot size should be 25 acres for this property. From the CDRC minutes of 9/22/04 when asked by the CDRC Chair what land division the he would

approve based on his findings, Dr. Wust said the property supports what is currently on the site: five lots, the existing four houses serviced by one well. He said the drilling of additional wells will not change his findings; wells have very low yield. He explained that the number of wells is "fairly irrelevant" to the water availability calculation and the aquifer properties. When asked by CDRC member Kathleen Holian to explain his position on the case, Dr. Wust said he concluded that "every piece of information gathered" suggested deficient water availability for the proposed subdivision. Stating she found the County Hydrologist's testimony very compelling, Member Holian said the development would pose a danger to the existing residents and potential buyers of the subdivision. The County staff recommended denial of the proposed subdivision, based on the review by the County Hydrologist. The CDRC voted six to one to deny the development plan and plat approval. It was subsequently denied by the County Commission at the September 2004 meeting by a unanimous vote.

I was surprised when I heard that this same property was now up for approval for another proposed subdivision. I was shocked that the County would even consider reviewing this again since both the CDRC and the County Commission had already reviewed all of the data and testimony that indicated a deficient water supply and had wisely denied the previous application. In her June 10, 2009 memo to Vicki Lucero of County Development, County Water resource Specialist Laurie Treviso wrote,"The May 19, 2004 review should be utilized for this development as no additional data of substance has been submitted. The review did not support sufficient water availability." To date no data has been submitted supporting sufficient water availability. Why then is this even being considered? The area geology and hydrology hasn't changed, and no one has yet demonstrated that there is an adequate water supply or that there would be no significant drawdown in the aquifer in surrounding properties.

The purpose of most government agencies is to promote the general welfare of its constituents. The County Development Department works on behalf of its constituents by requiring that certain standards are met in matters of land development, to protect them from potentially harmful situations. In this case we, the neighbors surrounding this proposed property, and potential buyers of the subdivision are the constituents. It is us, and our interests as potentially affected county residents, that the County should be protecting. There is compelling evidence, both general for the area, and specific to this plot of land, indicating that the aquifer will not sustain this development. To the developers this is just a business venture; to us it could pose a danger, as Kathleen Holian so aptly put it. We are asking you to protect our interests and deny the proposed subdivision, for a second time.

Sincerely,

Andy Dalmy

Andy Dalmy

JOHN SHOMAKER & ASSOCIATES, INC.
WATER-RESOURCE AND ENVIRONMENTAL CONSULTANTS
2703 BROADBENT PARKWAY NE, SUITE D
ALBUQUERQUE, NEW MEXICO 87107
(505) 345-3407, FAX (505) 345-9920

March 18, 2004

Stephen L. Wust, Ph.D.
County Hydrologist
Santa Fe County
205 Montezuma Avenue
Santa Fe, New Mexico 87501

RE: CDRC Case #S 03-5920 Las Animas Subdivision

Dear Dr. Wust:

John Shomaker & Associates, Inc. (JSAI) was retained by Mr. Andy Dalmy to review the water supply submittals for the proposed Las Animas Subdivision near Glorieta, New Mexico. The proposed Las Animas Subdivision calls for nineteen 2.71-acre lots on a 51.55 parcel of land located in T15N., R11E., Sections 1 and 2. Also, at least four shared wells are proposed for water supply. Mr. Dalmy owns 40 acres along the east side of the proposed subdivision, and his water supply well is approximately 400 ft from the nearest well proposed for the subdivision (UP-2812).

To provide an assessment of the water supply plan for the proposed Las Animas Subdivision, the following material was reviewed:

- ☐ Report prepared by Glorieta Geoscience, Inc. (GGI) titled *Geohydrology of Kingsmill Subdivision, Santa Fe County, New Mexico, August 11, 1999.*
- ☐ June 24, 2003 memorandum prepared by Mr. Dennis Cooper supporting Las Animas (formerly Kingsmill) Subdivision.
- ☐ January 2, 2004 memo from Stephen Wust, County Hydrologist.
- ☐ January 12, 2004 memo from Mara Smith, NMOSE, Water Use and Conservation Bureau.
- ☐ March 1, 2004, memo prepared by Dennis R. Cooper regarding the analysis of 100-year water availability for Las Animas Subdivision.
- ☐ Logs from wells UP-2812 and UP-3364, drilled on the land proposed for the Las Animas Subdivision.
- ☐ Well records and data from New Mexico Office of the State Engineer.
- ☐ Published geologic maps and reports on the area surrounding the proposed Las Animas Subdivision.
- ☐ Santa Fe County Land Development Code.

The following findings are based on my review of the above material, and 15 years experience as a professional hydrogeologist in New Mexico.

Review of Well Logs

1. The water supply wells in the area produce from the Sangre de Cristo Formation and overlying alluvium where present.
2. The Madera Limestone, underlying the Sangre de Cristo Formation, was tapped by well UP-2812 from 550 to 600 ft below ground level, and reported by GGI as **not water bearing.**
3. A review of over 70 wells drilled in the Sangre de Cristo Formation surrounding the proposed subdivision (T15N, R11E, Sections 1 and 2) shows that the production is limited to the sandstone beds in the upper 300 ft, and there is no increase in production for wells with depth greater than 300 ft.
4. There is no evidence of water production from the mudstone and shale beds in the Sangre de Cristo Formation. It appears that well yield is controlled by fracture permeability in thin sandstone beds of the upper Sangre de Cristo Formation. A report by Griggs and Hendrickson (1951) states that water production from the Sangre de Cristo Formation is limited to sandstone beds in the upper 200 ft of the formation (Griggs, R. L., and Hendrickson, G. E., 1951, Geology and ground-water resources of San Miguel County, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Ground-Water Report 2, 121 p).
5. The Drill logs for UP-2812 and UP-3364 shows predominately shale (mudstone) with occasional thin sandstone beds. The sandstone beds do not correlated between the two wells, indicating they are discontinuous and limited in extent.

Review of Pumping Test Performed on Well UP-2812

1. Initial pumping of UP-2812 at an average rate of 12.5 gpm for 280 minutes resulted in a pumping water level of 404 ft.
2. A 48-hour constant-rate pumping test at 10 gpm was performed on well UP-2812 and is described in the GGI report. A barrier boundary was observed after 450 minutes of pumping. The water level recovered within 0.9 ft of the original water level 19 days after pumping had stopped, indicating the aquifer tapped by the well is limited in extent.
3. An analysis of the specific capacity and transmissivity derived from the pumping test resulted in a specific yield of less than 0.04, which is consistent with the estimate by GGI.

Review of Water Availability Calculations

1. Mr. Cooper's analysis assumes the entire interval tapped by the well contains water in storage, when in fact the driller only records production from sandstones in the upper 200 ft of UP-2812, and 250 ft in UP-3364, and GGI states the Madera Limestone (550 to 600 ft in UP-2812) is not water bearing. Mr. Cooper's storage calculations appear to be over stated.
2. The total thickness of water producing sandstone in UP-2812 is 35 ft, and the total thickness of water producing sandstone in UP-3364 is 70 ft. These sandstone beds are in the upper 250 ft of the Sangre de Cristo Formation, which is consistent with well data for the area and other published reports.
3. The minimum lot size calculations should be revised to reflect ground-water storage from only the producing sandstone beds (from well logs), and a specific yield of 0.04 (SY*ST = 0.04*35 = 1.4). **The resulting calculation would equal 25 acres for minimum lot size.**
4. Mr. Cooper's water availability calculations do not consider aquifer depletion from neighboring users (existing water rights). Within a 1-mile radius of the proposed Las Animas Subdivision there are approximately 80 domestic wells, 12 multiple domestic household wells, and one community well for the East Glorieta MDWCA.

Review of GGI Drawdown Effects from Proposed Subdivision

1. GGI estimated a 100-year drawdown of 89 ft at the proposed supply well UP-2812, and a pumping water level of 201 ft using a theoretical drawdown model. Although the model simulates the short-term recovery water level observed from the pumping test, it is likely the aquifer is more limited in extent than assumed in the model and not suitable as a 100-year water supply.
2. Long-term pumping will dewater the aquifer beneath the proposed subdivision causing a significant reduction in transmissivity over time. The drawdown model assumes transmissivity is constant for the 100-year period, thereby under-predicting pumping water levels and over-predicting sustainability of water supply.
3. The barrier boundary observed during the testing of UP-2812 indicated the aquifer around the well was dewatered 0.9 ft from pumping 32,300 gallons (total pumped during testing). At an average long-term pumping rate of 0.6 gpm, the effects of the barrier boundary may result in an additional drawdown of 9 ft per year, indicating the well may pump dry after 20 years.
4. Long-term water level observations are needed to determine if the area can sustain additional development.
5. GGI and Mr. Copper did not attempt to calculate drawdown effects on neighboring wells. As previously mentioned, there are over 90 wells within a one-mile radius (based on NMOSE WATERS database).

Review of Land Use Code Issues

1. The proposed Las Animas Subdivision is located between the Mountain and Homestead Hydrogeologic Zones, and requires a minimum lot size of 20 to 40 acres (Letter from Mara Smith with Water Use and Conservation Bureau dated January 12, 2004). This is also consistent with the revised calculated MLS of 25 acres (described above).

Based on the review and analysis of existing data and reports on the water supply availability that is presented in this letter, the proposed Las Animas Subdivision should be denied. Without additional data and proof, I do not believe the water supply is adequate for the proposed 19 lots on 51.55 acres of land. In addition, it is highly likely that approval of the proposed subdivision would impact existing wells neighboring the property, and that the proposed subdivision wells will not be able to sustain a long-term water supply.

Please call if you would like to discuss the above issues in more detail.

Sincerely,

JOHN SHOMAKER & ASSOCIATES, INC.

Steven T. Finch, Jr.
V.P - Senior Geochemist/Hydrogeologist

STF:sf

CC: Andy Dalmy

GEOHYDROLOGY OF

KINGSMILL SUBDIVISION

SANTA FE COUNTY, NEW MEXICO

Prepared by: **Glorieta Geoscience, Inc.**
P.O. Box 5727
Santa Fe, NM 87502
(505) 983-5446

August 11, 1999

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INTRODUCTION

The proposed Kingsmill Subdivision is located in Santa Fe County, New Mexico, within the Traditional Community of Glorieta, within the northwest corner of Section 1 and the northeast corner of Section 2, T. 15N, R. 11E. (Figure 1). The property extends from S.R. 50 and Glorieta Creek on the north to U.S. 85 (West Frontage Road) on the south. The proposed subdivision covers approximately 51.55 acres. Ms. Phyllis Kingsmill, the property owner, proposes to subdivide the property into 20 lots. The minimum lot size will be 2.5 acres. Water will be supplied to the lots through shared wells that will be drilled by the developer, and will be limited to 0.25 acre-feet per year per lot. No more than four lots will be connected to a single well.

Well UP-2812 was drilled on-site and completed to a depth of 620 feet by Lujan Drilling. The well is situated along the edge of a broad valley between Glorieta Mesa to the south and the Sangre de Cristo Mountains to the north. A 48-hour pumping test was performed on the well at an average discharge of 10 gallons per minute (gpm).

SITE GEOLOGY

The Kingsmill property lies near the southern terminus of the Sangre de Cristo Mountains, at the approximate intersection of three regional physiographic provinces; the Rocky Mountains, the Basin and Range, and the Pecos Valley subsection of the Great Plains. The Kingsmill property is located between Glorieta Creek and Glorieta Mesa. The property is underlain by the lower Permian Sangre de Cristo Formation (Figure 2). The upper 550 feet of well UP-2812 were completed within the Sangre de Cristo Formation, penetrating a sequence of maroon, red, and gray, micaceous shale and mudstone with minor indurated siltstone and sandstone. Arkosic sandstone beds, ranging in thickness from 5 to 30 feet, were encountered at depths ranging from 70 to 480 feet in the subdivision well. Shales and mudstones with traces of oil were encountered at depths of 110-120 feet and 300-335 feet below ground surface (bgs).

From 550 to 620 feet bgs the subdivision well is completed within the Pennsylvanian Madera Formation. The well penetrated a hard, grey and white limestone with interbedded maroon and grey shales and mudstone. No water was encountered in the Madera Formation. The upper member of the Madera Formation is 550 to 1200 feet thick and consists of gray limestone, red and greenish-gray shale, and brownish-red conglomeratic sandstone (Johnson, 1973). A hydrogeologic cross-section of the subdivision area is presented in Figure 3.

DESCRIPTION OF AQUIFER SYSTEM

The subdivision property is underlain by reddish shale and mudstone beds with thin (5 to 30 feet thick) interbedded arkosic sandstone beds. The sandstone intervals encountered at depths between 70 and 480 feet comprise an aquifer capable of producing water in quantities sufficient for use by small water systems, shared wells, or domestic wells (see well logs in Appendix A and B).

The aquifer system is recharged by snow melt and rainfall in the Sangre de Cristo Mountains which form the headwaters of the Pecos River to the north, and by snowmelt and rainfall on Glorieta Mesa to the south of the property. Rainfall and snow melt percolate into the Permian and Pennsylvanian sedimentary rocks which are exposed over large areas of the Southern Sangre de Cristo Mountains on the east side of the Garcia Ranch Fault, part of the Picuris-Pecos fault system (Miller et al., 1963). Some recharge of the Sangre de Cristo Formation also likely occurs via infiltration through the Triassic and Permian sedimentary rocks overlying the Sangre de Cristo Formation on Glorieta Mesa. The discharge point for this water is the Pecos River east and south of the subdivision.

The potentiometric surface in the vicinity of the subdivision varies in elevation from approximately 7150 to 7000 feet. Wells drilled in the area to depths greater than 300 feet have penetrated confined aquifers. The depth to water is 48 feet in UP-2812, and the total depth of the well is 620 feet. Well logs from nearby wells are included in Appendix B.

Ground water flow is from west to east, subparallel to Glorieta Creek within Sections 1 and 2, and toward the Pecos River (Figure 4). The data used in construction of the water table map were derived from Glorieta Geoscience, Inc. (GGI) field measurements and from driller's logs of wells in the area.

Pumping Test Data

Well UP-2812 was drilled on the subdivision property between June 7 and June 9, 1999. The well was drilled by Lujan Drilling using the air rotary method. The well was completed with 4-1/2 inch PVC casing to the full depth of 620 feet. Slotted casing was installed as shown on the well log (Appendix A). Depth to water in the completed well was measured on June 14, 1999 at 48 feet below the top of the casing (47 feet bgs).

On June 14, 1999 a submersible pump was set in the well at a depth of 420 feet, and a pumping pre-test was performed to develop the well and establish a sustainable pumping rate for the 48-hour pumping test which would follow the pre-test. The well was pumped at rates from 8 to 30 gpm. However, for most of the pre-test, the well was pumped at an average rate of 12.5 gpm. The drawdown after 280 minutes of pumping was 404 feet. By the following morning, on June 15, the water level had recovered to 54.55 feet.

A 48-hour pumping test was conducted on UP-2812 beginning on the morning of June 15 and ending on the morning of June 17, 1999. The well was pumped at a constant discharge rate of 10 gpm. Total discharge from the well during the 24-hour test was approximately 28,800 gallons.

The water level at the start of the test in UP-2812 was 54.55 feet below top of casing. Total drawdown in the well after 48 hours of pumping was 242.34 feet. UP-2812 recovered to the static water level at the beginning of the 48-hour test (54.44 feet) within four days after the pump in UP-2812 was shut off. By July 6, 1999 (19 days after shutoff), the water level recovered to within 0.9 feet of the original, pre-test static water level of 48 feet.

Transmissivities were calculated from the drawdown and recovery data by the Jacob-Cooper modified non-equilibrium equation (straight-line method). Transmissivities (T)

calculated from the drawdown and recovery curves ranged from 30 to 110 gpd/ft (Appendix C). These values are relatively typical for the Sangre de Cristo Formation aquifer.

WATER AVAILABILITY

The Santa Fe County Land Development Code requires the demonstration of a 100-year water supply (Article VII, Section C). The probable yields of the proposed subdivision wells are based on the 48-hour pumping test conducted on well UP-2812, analytical model results, and on research of existing wells in the vicinity of the Kingsmill property. The wells in the vicinity of the Kingsmill subdivision are completed into interbedded sandstone, siltstone, and shale of the Sangre de Cristo Formation sandstone and siltstone aquifer. The pumping test data and well logs presented in Appendices B and C indicate that wells in the area typically produce between 5 and 15 gpm. Some higher production wells (e.g. UP-1932 and UP-2508) reportedly produce in excess of 50 gpm (UP-2508 was tested at 33 gpm for 50 hours, Drakos/GGI, 1997) whereas some low-production wells in the area produce less than 5 gpm (e.g. UP-210). It is apparent that most wells in the area can produce water in quantities sufficient for domestic use, and that factors such as specific well location, total depth, and completion strongly influence individual well production.

Probable Yield of Wells

Wells on the Kingsmill Subdivision property are completed into the Sangre de Cristo Formation. Water is produced primarily from sandstone units interbedded with lower permeability shales and mudstones. Well UP-2812 will become one of the shared domestic wells for the subdivision. The pumping test data and well log for this well indicate that subdivision wells should be capable of a sustainable production rate of 10 gpm. Based on an annual requirement of 0.25 afa per lot, at full-development, the 20-lot subdivision would require a water supply of 5.0 afa. This diversion is equivalent to an average, continuous pumping rate of approximately 3.1 gpm. The developer is proposing to drill an additional 3 or 4 shared wells on the property. Individual, average reliable well yields would have to be 0.6 gpm (continuous pumping).

Assuming the average household capacity is three persons, and each household requires 80 gallons per capita day (gpcd), each well will have to be capable of producing 960 gallons per day (4 homes/well x 3 persons x 80 gpcd). Assuming the wells can produce at the rate of 10 gpm, and adequate storage is available, the wells will be able to meet the total daily demand of five residences by pumping for 1.5 hours per day (960 gallons/10 gpm).

The 48-hour pumping test of well UP-2812 has demonstrated that this well has the capacity to meet the daily water demand of 4 households. The well produced 28,800 gallons during the test. This is equivalent to a six-day water supply for 20 homes at 240 gallons per day per residence. Drawdown in UP-2812 after 96 minutes of pumping at 10 gpm was 112 feet (165 feet bgs). This is above the uppermost screen (260 feet bgs) and the present pump setting (420 feet bgs).

100-Year Water Availability

The sustainability of the ground-water supply over a period of at least 100 years is demonstrated through the use of the Theis analytical method. The Office of the State Engineer (OSE) Th97 model code was used to project 100-year water level declines in the immediate vicinity of the subdivision's production wells.

The coefficients for the aquifer underlying the Kingsmill Subdivision were calculated from pumping test data from well UP-2812 and from Theis model replication of the pumping test. The Theis model was run with the average transmissivity calculated from the pumping test, 80 gpd/ft (Appendix C). The storage coefficient (S) was then estimated by replicating the total drawdown and recovery curves from the pumping test. Because the well did not fully recover between the end of the pre-test and the beginning of the 48-hour pumping test, the pre-test pumping data was also included.

Semi-log and log/log plots of the UP-2812 test drawdown and recovery data do not reveal the presence of boundary conditions (Appendix C). Model runs were therefore also used to investigate whether undetected boundary conditions could account for the observed drawdown and recovery in the pumping test. The model output and data plot are found in Appendix D.

The test results from well UP-2812 were replicated without the need to incorporate a boundary condition into the model. A transmissivity (T) value of 80 gpd/ft and an S value of 0.04 were estimated. The use of lower values for T and S (confined) or the inclusion of nearby no-flow boundaries (to represent pinching out of the sandstone units) resulted in significant over-estimation of theoretical drawdown with respect to observed drawdown and recovery. The results, therefore, indicate that the inflection in the drawdown curve at 450 minutes is probably due to a change (decrease) in permeability.

The theoretical drawdown model results also show that full recovery (under water table conditions) would not occur within 90 days of shutoff. In fact the theoretical residual 12th day drawdown of 3.1 feet and 19th day residual drawdown of 1.8 feet compare well with the observed 12th day and 19th day residual drawdowns of 3.2 feet and 0.91 feet, respectively.

The results of the replication model run were used in the Th97 model to predict 100-year water level declines in the immediate vicinity of the proposed production wells (Appendix E). A conservative analysis is desirable, therefore long-term analysis of water level declines at these wells should be made using the T value calculated from late-time data, or 30 gpd/ft. An S value of 0.04 was used. Five shared wells (four residences per well) were assumed for full development, with each well pumping at a rate of 0.6 gpm for 100 years. This rate is equivalent to the subdivision's water requirement at full-development of 0.25 afa per lot. The model also used three additional wells to represent the effects of off-site pumping. The off-site pumping centers were placed within 500 to 700 feet of the nearest subdivision well. Off-site well diversions were assumed at 0.25 afa.

The results of the model analysis show that the 100-year drawdown will be approximately 89 feet in the immediate vicinity (0.05 foot radius) of the wells. The model output and a sketch of the well field are provided in Appendix E.

The model results are compared to the total available drawdown in well UP-2812. The total available drawdown, as defined by the County Land Development (Article VII, section 6.4.2d), is measured from the water table to the lowest pumping level reached during the pumping test, less a 20% contingency factor to account for pump setting, sediment accumulation

and drought/seasonal fluctuations. Under this criteria, the total available drawdown in UP-2812 is 112 feet (0.8 x [187.8 - 48]). This is approximately 23 feet more that the projected 100-year water level decline of 89 feet. According to the well log, a water level decline of 89 feet will result in dewatering of only the uppermost 30 feet of the total 130 feet of productive sandstone. The pumping (dynamic) water level in the wells at the end of 100 years would be as follows:

89 ft. (permanent dewatering) + 112 ft. (drawdown at end of 1.5 hrs. @ 10 gpm) = 201 ft.

The UP-2812 well test has already demonstrated that the well can produce 10 gpm with a drawdown of at least 188 feet (236 ft. bgs).

WATER QUALITY

Water quality samples from UP-2812 were collected during the pumping test and submitted to Inter-Mountain Laboratories, Inc. (IML) in Farmington, New Mexico for analysis. Water quality samples were analyzed for inorganic constituents listed by Santa Fe County in Section VII.6.5 of the Land Development Code. All primary (health related) constituents are within federal Environmental Protection Agency (EPA) and Santa Fe County standards (MCL). With the exception of sodium and pH, all secondary constituents (SMCL) are within EPA and Santa Fe County drinking water standards. The presence of relatively high sodium and low chloride indicates that the water is soft. Analytical results are summarized in Table1. The complete analysis from IML is provided in Appendix F.

The lab analysis detected a concentration of sodium of 131 mg/l. **The Santa Fe County Land Development Code requires sodium concentrations in excess of 20 mg/l to be noted in the Disclosure Statement.**

REFERENCES CITED

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Johnson, R.B., 1973, Geologic map of the Pecos quadrangle, San Miguel and Santa Fe Counties, New Mexico: U.S. Geological Survey, Geologic Quadrangle Map GQ-1110, scale 1:24,000.

Miller, J.P., Montgomery, A., and Sutherland, P.K., 1963, Geology of part of the southern Sangre de Cristo Mountains, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Memoir 11, 106 p. plus Plate.

P.O. Box 5727
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Glorieta Geoscience, Inc.

Well/Project: **Kingsmill well - UP-2812**
Drilling Co.:Lujan Drilling Co.
Drilling Method: Air Rotary
Total Depth: 620 feet bgs (cased)
Casing: 4" ID PVC
Surface elevation:7170
Casing stick-up: 1.0 ft
Depth to Water: 47.9 ft bgs
Screen: 0.032" slot

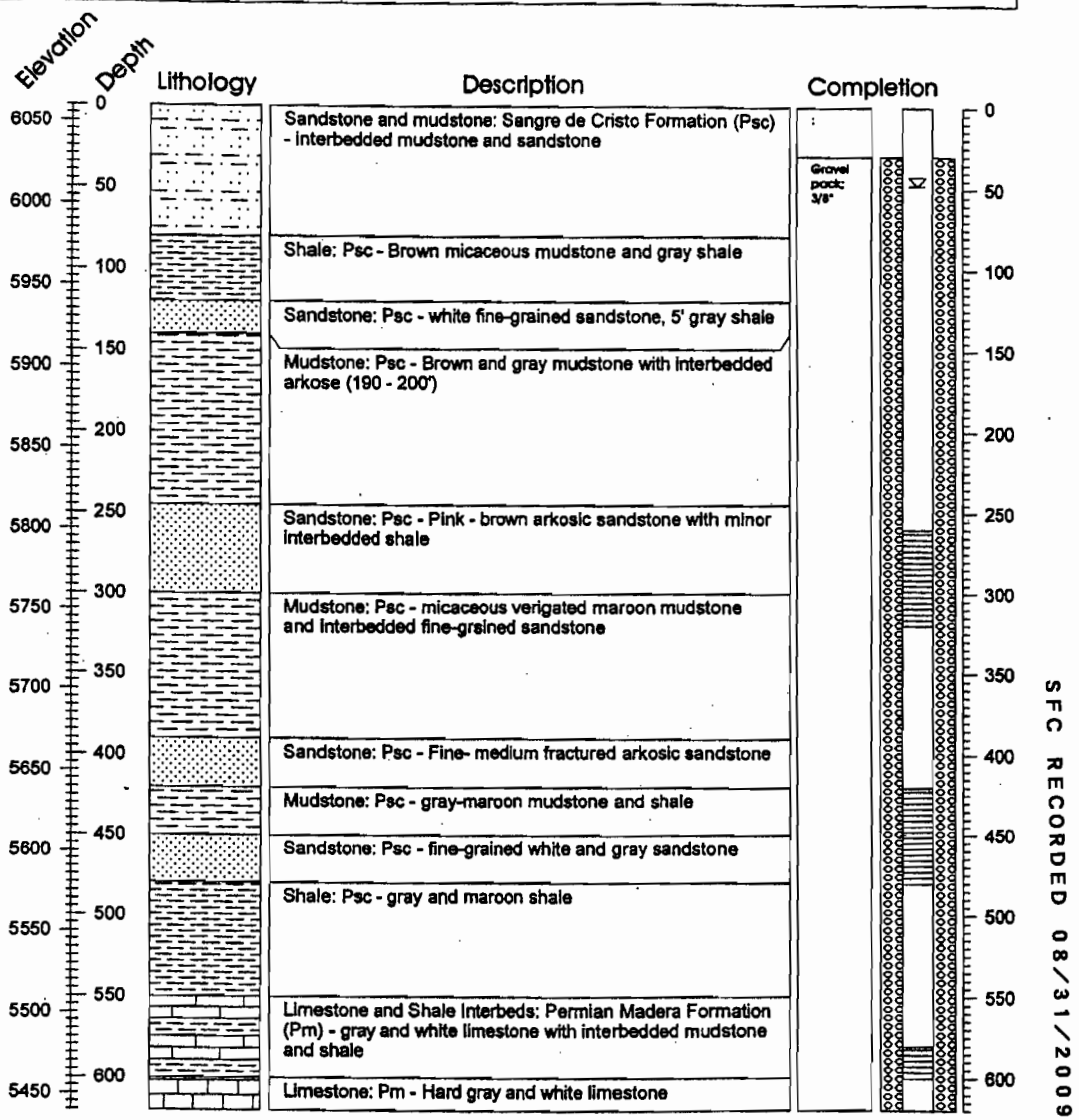

Figure 3c. Kingsmill well number UP-2812 well log and lithologic explanation.

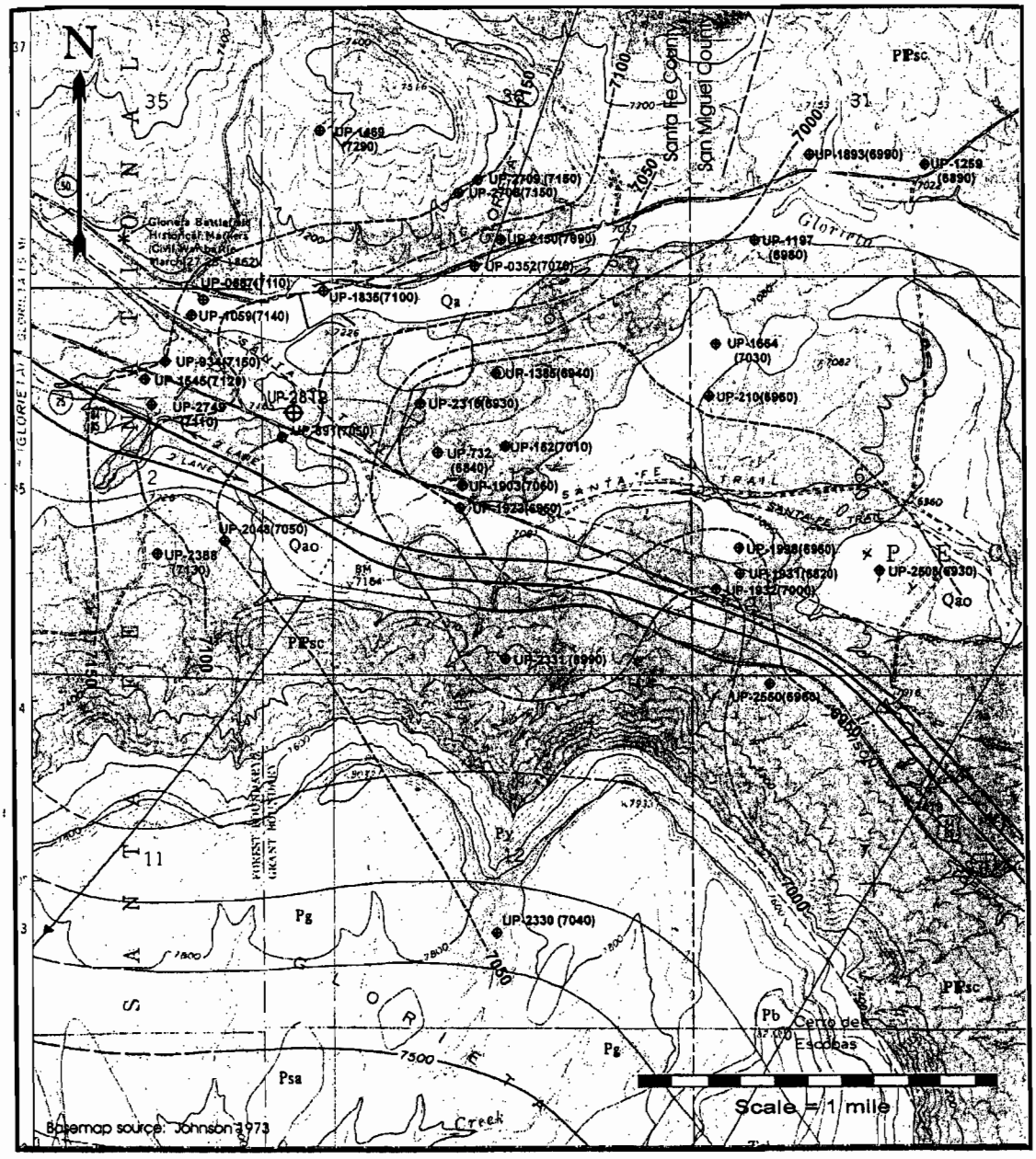

Figure 4. Potentiometric Surface Map

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SANTA FE COUNTY

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County Hydrologist

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E-Mail: swust@co.santa-fe.nm.us

MEMORANDUM

June 24, 2003

To: Santa Fe County

Through: Oralynn Guerrerortiz

From: Dennis Cooper

Re: CDRC Case #DP 99-5700 Kingsmill Subdivision

The Kingsmill Subdivision is proposed on a 55.55 acre tract in sections 1 and 2 of T15N, R11E. The Geohydrology Report was prepared by Glorieta Geoscience Inc. (GGI) on August 11, 1999. This report included information on a well that was drilled on the property and subjected to a 48 hour well test.

A November 23, 1999 memo from Jack P. Frost County Hydrologist at that time, to County Land Use Officials recommending that at least one more well be drilled and evaluated. He also recommended some well log data from surrounding wells be prepared and submitted. An Addendum Geohydrology Report was prepared by GGI and submitted on February 10, 2000 to address the information requests of Mr. Frost, with the exception of the drilling of the second well. The Geohydrology Report and the Addendum Geohydrology Report are in the files of Santa Fe County.

An October 3, 2002 memo from Katherine Yuhas, County Hydrologist at that time, to Penny Ellis-Green stated the application was not complete until the information on the second well was submitted. Ms. Yuhas stated that a well should be drilled and a pumping test conducted on that well.

Ms. Yuhas stated the following to me in an email dated February 13, 2003:

> If the second well looks similar to the first, I will not require the second pumping test. I will need a brief write-up of the second well and how it compares to the first one.
>
> If the water quality data is more than one year old, or if anything in the first test was close to standards I will need new water quality data otherwise Kingsmill can use the testing data from the first well.

The second well was drilled on the property and completed on April 8, 2003. The well was drilled to a depth of 400 feet, and the drillers estimated yield was 85 gallons per minute. The driller (Lujan Drilling, who also drilled the first well) stated that the second well was much stronger than the first. I was on-site at times during the drilling and the development of the well, and the yield from the well was high for this area. During the development of well after the casing was installed, the yield from this well was in excess of 25 gallons per minute.

A location map is attached showing the approximate outline of the 55.55 acre tract and the location of Well No. 1, and Well No. 2, as located by GPS.

A comparison of the two wells is shown below:

	Well No. 1	**Well No. 2**
OSE number	UP-2812	UP-3364
Total Depth of Well	620 feet	400 feet
Depth to water	54 feet	71 feet
Driller's Estimated Yield	10 gpm	85 gpm
Deepest Water Producing Zone	200 feet	270 feet
Description of Water Producing Zones	20' – 40' Light Yellow Sandstone—2 gpm 70' – 80' Fine Grained Sandstone—2 gpm 120' – 140' White Sandstone—2 gpm 190'—200' Arkosic Sandstone—4 gpm	85' — 105 '—Yellow Sandstone—10 gpm 125'—140' Gray Sandstone—25 gpm 240'—270' Grayish Blue Sandstone—50 gpm

A comparison of the two wells indicates that each well is completed into the Sangre de Cristo Formation, with the first well continuing into Madera Limestone. The second well was not drilled into the Madera, as the well had encountered significant water yielding zones within the Sangre de Cristo, and because the first well did not find any water producing zones in the Madera. The second well encountered water bearing zones that are similar to those encountered by the first well, except they yield higher quantities of water. This indicates a greater degree of fracturing in the water bearing zones found by the second well.

The second well provides supporting information to that supplied by the first well and well test. A well test was not performed on the second well in accordance with Ms. Yuhas' email of February, which stated "If the second well looks similar to the first, I will not require the second pumping test." As stated above, this well is similar in the description of the water bearing zones encountered, except that the second well water production is much stronger than the first well.

The water quality report was more than one year old, so in accordance with the portion of February 13 email which stated: "If the water quality data is more than one year old, or if anything in the first test was close to standards I will need new water quality data otherwise Kingsmill can use the testing data from the first well." A second water quality analyses was done on a sample from the first well. The second well is not yet equipped with a pump nor is electricity yet available at that site, which determined the choice of testing the water from the first well.

The table on the next page shows the comparison of the water quality results from the two water quality analyses, and also compares the values to the Santa Fe County Standards. As can be seen, the water quality in the two tests is very similar, and each meets the Santa Fe County standards, except for sodium. The Santa Fe County standard is 100 mg/l, while the 1999 analyses showed a concentration of 131 mg/l, while the 2003 analyses showed a concentration of 136 mg/l. The standard for sodium is a secondary standard, esthetic related, and the Code notes that any sodium concentration above 20 mg/l must be noted in the disclosure statement. The Disclosure Statement will note this sodium concentration.

Constituent	1999 Water Analyses	2003 Water Analyses	Santa Fe County Standard
	Mg/l unless otherwise noted	Mg/l unless otherwise noted	Mg/l unless otherwise noted
Antimony	<0.005	0.001	0.006
Arsenic	0.015	ND	0.05
Alkalinity	130	255	No Standard
Aluminum	<0.05	ND	0.05
Barium	0.03	0.043	2
Beryllium	<0.01	ND	0.004
Cadmium	<0.01	ND	0.005
Chromium	<0.01	ND	0.1
Cyanide	<0.01	ND	0.2
Calcium	11.1	30.9	No Standard
Chloride	35	10.0	250
Color	<1 CU	ND	15 CU
Copper	<0.01	0.011	1.3
Fluoride	0.35	ND	4.0
Foaming agents	<0.05	ND	0.5
Hardness	40	110	250
Iron	<0.02	ND	0.3
Lead	<0.005	ND	0.015
Mercury	<0.001	ND	0.002
Manganese	0.02	0.014	0.05
Nickel	<0.01	ND	0.1
Nitrate	<0.05	ND	10
Nitrite	<0.05	ND	1
Odor	<1 T.O.N.	ND	3 T.O.N.
pH	8.6 s.u.	7.9 s.u.	6.5-8.5 s.u.
Selenium	<0.005	0.002	0.05
Silver	<0.01	ND	0.1
Sodium	131	136	100
Sulfate	106	116	250
Thallium	<0.005	ND	0.002
TDS	430	463	500
Turbidity	3 NTU	ND	5 NTU
Zinc	<0.025	0.013	5

A copy of the well record for well no. 2, and a copy of the 2003 water quality analyses are attached. A copy of each of the County Hydrologist's memorandum and the February 13, 2003 email from Katherine Yuhas to Dennis Cooper are also attached.

It is my opinion that the Kingsmill subdivision has met the requirements stated in the memoranda by previous County Hydrologists (the memoranda noted above) and that the subdivision proposal is complete. The hydrology and water supply availability should be reviewed by Santa Fe County using the 1999 Geohydrology Report, the 2000 Addendum to the Geohydrology Report, each prepared by GGI, and the information regarding the second well contained in and attached to this memorandum.

Section 6. LOG OF HOLE

Depth in Feet From	Depth in Feet To	Thickness in Feet	Color and Type of Material Encountered
0	1	1	Redish Brown - Surface Dirt
1	40	39	Yellow - Sandstone
40	50	10	Gray - Sandstone
50	85	35	Red & Gray - Shale
85	105	20	Yellow - Sandstone
105	125	20	Red & Gray - Shale & Siltstone
125	140	15	Gray - Sandstone
140	205	65	Red & Gray - Shale & Siltstone
205	220	15	Redish Gray - Sandstone
220	240	20	Red - Siltstone
240	270	30	Grayish Blue - Sandstone
270	350	80	Red & Gray - Shale & Siltstone
350	370	20	Gray - Sandstone
370	400	30	Red - Shale & Siltstone

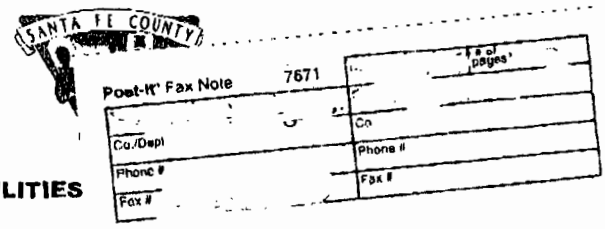
Section 7. REMARKS AND ADDITIONAL INFORMATION

SFC RECORDED 08/31/2009

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the ab described hole.

Driller

INSTRUCTIONS: This form should be executed in triplicate, preferably typewritten, and submitted to the appropriate district o of the State Engineer. All sections, except Section 5, shall be answered as completely and accurately as possible when any w drilled, repaired or deepened. When this form is used as a plugging record, only Section 1(a) and Section 5 need be completed.



UTILITIES

6 January 2004

TO: Wayne Dalton, Land Use Department
FROM: Stephen Wust, County Hydrologist SW
RE: CDRC Case #S 03-5920 Los Animas Subdivision

I have reviewed the above referenced submittal. I have a number of significant issues with the water supply documentation.

1) This development constitutes a Public Water Supply (PWS) under State and Federal regulations, and a Community Water System under the County Land Development Code. The submittal must be in accordance with the requirements for a Community Water System, Article VII Section 6.3.
   a) The "Owner", in this case the developer, is drilling the wells, and retains ownership until a sufficient number of households are constructed to transfer ownership. This arrangement results in a single entity constructing and developing a water system to serve 19 residences. Eventual transfer of the wells to homeowners does not negate the construction of a water system (even with multiple wells) under common ownership. In addition, it is not clear from the well sharing agreement that the homeowners will actually own the wells and any water rights, or merely be responsible for all expenses. In fact, the covenants prohibit individual wells (Article II L). Thus this is clearly a Community Water System.
   b) One of the wells is scheduled to serve 12 households, making it a Community Water System no matter the status of the other wells. A well sharing agreement for this well simply transfers ownership (possibly – see 1a above), but does not change the status.

2) The geohydrologic report is missing a number of key elements.
   a) The report from GGI, which was heavily referenced in the Cooper summary, calculated water availability by determining whether sufficient water column exists in the original well for a 100-year drawdown. This is not the methodology used to determine a 100-year water availability; it is used to determine long-term effects on a well. The geohydrologic report must show a 100-year water availability.
   b) The GGI report determined effects on the aquifer by modeling several wells pumping at a maximum rate of 10 gpm. However, the second well, tapping the same water-bearing unit as the first, is slated for a capacity of

89 gpm, which will be needed if that is the well supplying 12 households. The geohydrologic report must determine effects on the aquifer and surrounding wells (including the other wells on the property) from a well pumping at the higher rate.

3) Disclosure Statement Item 17 states "...metering results provided to the County of Santa Fe, if and when asked." County metering provisions require annual submittal of meter readings, not when the County requests them.

4) All but a very small portion of this subdivision is outside of the Glorieta Traditional Community boundaries, and therefore cannot use the provisions assigned to traditional communities, as for example minimum lot size (Land Development Code, Article III Section 10.3.3). The subdivision is in the Homestead Zone, and must follow the Code requirements for such.

5) Because no water availability was calculated, the proposed minimum lot size must be taken from the standard listings in the Land Development Code, Article III Section 10.2.2. A water restriction of 0.25 acre-feet per year per lot would give a minimum lot size of 40 acres for this development.

I recommend that this permit be denied, and that the applicant be directed to resubmit, with the provisions of a Community Water System and location within the Homestead Zone.

If you have any questions, please call me at 992-9876 or email at swust.

DENNIS R. COOPER, CONSULTING ENGINEER
115 E. Alicante
Santa Fe, New Mexico 87505-4651

Telephone 505-983-4366
Fax 505-983-4306
Email dcooper@nets.com

March 1, 2004

Stephen Wust
County Hydrologist
Santa Fe County
P.O. Box 276
Santa Fe, New Mexico 87504-0276

Re: Las Animas Subdivision

Dear Mr. Wust:

I have attached an *Analysis of 100 Year Water Availability* as an Addendum to my June 24, 2003 Memorandum regarding this subdivision. I believe it is responsive to the concerns you have raised. As noted in this addendum, the water availability calculations show a 100 year water availability of from 0.28 to 0.29 acre-feet per lot per year.

Please let me know if I can provide additional information.

Sincerely,

Dennis R. Cooper

Encl.

Copy w/ encl.: Wayne Dalton, Santa Fe County Land Use
Oralynn Guerrerortiz

Las Animas Subdivision
Santa Fe County, New Mexico

Analysis of 100 Year Water Availability

Prepared by Dennis R. Cooper, Consulting Engineer
February 27, 2004

At the request of Steven Wust, Santa Fe County Hydrologist, a 100 year water availability analysis has been prepared based on the two existing wells in the subdivision. This proposed subdivision consists of 19 lots on 51.55 acres of land. Two wells, UP-2812 and UP-3364 were drilled as part of the submittal and approval process and for the purpose of providing water to the subdivision. The well records have been provided in previous geohydrology submittals to Santa Fe County for this subdivision, discussed below and shown in the references.

A water supply in ground water storage for 100 years must be demonstrated in this area by the use of the Minimum Lot Size formulas devised by Santa Fe County.

MLS = U/A

MLS = average lot size in acres = 2.71 acres in this case
U = Water use per lot in acre-feet per year
A = Water availability per acre in acre-feet per year

A = S / (AC X T)

S = water in storage in acre-feet
AC = Area = 51.55 acres
T = Time = 100 years

S = AC X SY X ST X RL X RC

AC = 51.55 acres
SY = Specific Yield
ST = Saturated Thickness in feet
RL = 1.0 (with a well test) = Reliability Factor
RC = 0.8 = Recovery Factor

The saturated thickness in well UP-2812 is that material below 54 feet to the bottom of the well. Not all of the material encountered will provide water from storage to a well, however. The writer of this report was not on-site for the drilling of this well, but relied upon the drillers record and the well record prepared by GGI. The following table shows the material encountered by the well below 54 feet as described by the driller's log, and the specific yield value assigned to each particular sequence.

Well UP-2812

Material encountered					
From	To	Thickness (ST)	Description	Assigned SY	ST X SY
54	70	16	Brown gray mudstone	0.01	0.16
70	80	10	FG Sandstone	0.1	1
80	110	30	Brown mudstone	0.01	0.3
110	120	10	Gray shale	0	0
120	140	20	Fine-med white sandstone	0.1	2
140	170	30	Brown mudstone	0.01	0.3
170	190	20	gray sand & shale	0.02	0.4
190	200	10	arkosic sandstone	0.1	1
200	245	45	Brown mudstone	0.01	0.45
245	260	15	Brown ark. Sandstone	0.04	0.6
260	270	10	Gray shale	0	0
270	300	30	Pink/gray ark sandstone	0.04	1.2
300	335	35	micaceous mudstone	0.01	0.35
335	340	5	Lt brown sandstone	0.04	0.2
340	370	30	mudstone & fine sandstone	0.02	0.6
370	390	20	mudstone	0.01	0.2
390	420	30	fin/med fractured Sandstone	0.08	2.4
420	440	20	Fractured Gray shale	0	0
440	450	10	maroon mudstone	0.01	0.1
450	460	10	fine gray sandstone	0.02	0.2
460	480	20	pink cemented sandstone	0	0
480	490	10	gray shale	0	0
490	550	60	maroon mudstone	0.01	0.6
550	580	30	gray & white limestone	0.02	0.6
580	590	10	Maroon & gray shale	0	0
590	600	10	fine sand maroon mudstone & limestone	0.02	0.2
600	620	20	Hard gray & white limestone	0.02	0.4
Totals		566			13.26

The total value of specific yield times saturated thickness is 13.26 feet, as shown by the above table. The sequences described as shale were assigned a value of 0.0, while the other sequences were assigned the specific yield values shown. The sandstone sequences where the driller noted water production were assigned a specific yield of 0.10, while other sandstones sequences were assigned from 0.04 to 0.08 for the one sequence

described as fractured sandstone. The well was drilled with air, and in most of the sequences, the water encountered influenced the selection of a specific yield value.

The overall specific yield for the saturated zone in this well between 54 feet and 620 feet, the bottom of the well, is calculated as 13.26 feet / 566 feet = 0.0234.

The saturated thickness in well UP-3364 is that material below 71 feet to the bottom of the well. Again, not all of the material encountered will provide water from storage to a well. The writer of this report was on-site for the drilling of this well and examined the samples caught by the driller in addition to relying upon the drillers record. The following table shows the material encountered by the well below 71 feet as described by the driller's log, and the specific yield value assigned to each particular sequence.

Well UP-3364

Material encountered					
From	To	Thickness (ST)	Description	Assigned SY	ST X SY
71	85	14	Red and gray shale	0	0
85	105	20	Yellow sandstone	0.15	3
105	125	20	Red & Gray shale	0	0
125	140	15	Gray sandstone	0.04	0.6
120	140	20	Fine-med white sandstone	0.15	3
140	205	65	Red & Gray shale & siltstone	0	0
205	220	15	Reddish gray sandstone	0.04	0.6
220	240	20	Red siltstone	0.02	0.4
240	270	30	Gray blue sandstone	0.15	4.5
270	350	80	Red & gray shale & siltstone	0	0
350	370	20	Gray sandstone	0.04	0.8
370	400	30	Red gray shale & siltstone	0	0
Totals		349			12.9
Overall SY = SY X ST / Total saturated depth =			0.037		

The total value of specific yield times saturated thickness is 12.9 feet, as shown by the above table. The sequences described as shale were assigned a value of 0.0, while the other sequences were assigned the specific yield values shown. The sandstone

sequences where the driller noted significant water production were assigned a specific yield of 0.15, while other sandstones sequences were assigned 0.04. The well was drilled with air and the water encountered influenced the selection of a specific yield value. This well produced considerably more water than the first well, and it is felt the sandstone sequences were more fractured, thus the selection of the higher specific yield value for those water producing sandstone sequences.

The value of specific yield for sandstone ranges from 5% (Johnson, 1967) to 10% - 40% (Walton, 1984) and 21% (Todd, 1980). The overall specific yield value for the entire saturated zone in this well is 0.037.

The overall specific yield calculated for each of the two wells is 0.0234 and 0.037 respectively, which are conservative values within the range of values given in the literature. It should be noted that GGI chose a value of 0.04 for their long term drawdown calculations.

The minimum lot size calculations are as follows:

For SY X ST of 13.26 feet

S = 51.55 acres X 13.26 feet X 0.8 X 1.0 = 546.8 acre-feet

A = S / (AC X T) = 546.8 acre-feet / (51.55 acres X 100 years) = 0.1061 af/ac

MLS = U/A and U = MLS X A

U = 2.71 acres X 0.1061 acre-feet per acre = 0.29 acre-feet per year for each of the 19 lots.

For SY X ST of 12.9 feet

S = 51.55 acres X 12.9 feet X 0.8 X 1.0 = 532.0 acre-feet

A = S / (AC X T) = 532.0 acre-feet / (51.55 acres X 100 years) = 0.1032 af/ac

MLS = U/A and U = MLS X A

U = 2.71 acres X 0.1032 acre-feet per acre = 0.28 acre-feet per year for each of the 19 lots.

The calculation demonstrates a 100 year supply of water for the 19 lots of from 0.28 to 0.29 acre-feet per lot per year. This 100 year supply is adequate for the subdivision as proposed.

It is my opinion that the Kingsmill Subdivision (Las Animas Subdivision) has met the requirements stated in the memoranda by previous County Hydrologists, as well as the comments of the present County Hydrologist, and that the subdivision proposal is complete. The hydrology and water supply availability should be reviewed by Santa Fe County using the 1999 Geohydrology Report, the 2000 Addendum to the Geohydrology Report, each prepared by GGI, the information regarding the second well contained in and attached to the Cooper June 24, 2003 memorandum, and the information contained in this analysis.

REFERENCES

Cooper, D.R., 2003, Memorandum to Santa Fe County for CDRC Case # DP 99-5700 Kingsmill Subdivision: Unpublished Consultant Report.

Glorieta Geoscience, Inc., 1999, Geohydrology of Kingsmill Subdivision, Santa Fe County, New Mexico: Unpublished Consultant Report.

Glorieta Geoscience, Inc., 2000, Addendum Geohydrology of Kingsmill Subdivision, Santa Fe County, New Mexico: Unpublished Consultant Report.

Johnson, A.I., , 1967, Specific Yield-Compilation of Specific Yields for Various Materials: U.S. Geological Survey Water-Supply Paper 1662-D

Todd, David Keith, 1959 and 1980, Groundwater Hydrology: John Wiley and Sons, Inc.

Walton, William C., 1984, Practical Aspects of Groundwater Modeling: National Water Well Association, pp. 20 & 21.

UTILITIES DEPARTMENT

5 April 2004

TO: Wayne Dalton, Land Use Department
FROM: Stephen Wust, County Hydrologist
RE: CDRC Case #S 03-5920 Las Animas Subdivision

As a rule, I try to avoid countermanding previous decisions on water availability issued by preceding County Hydrologists. Following this logic, I had performed only a quick review of the Las Animas application, with the understanding that Katherine Yuhas had already provided a favorable review. Upon closer examination of the administrative record, I now realize that Katherine had never issued an opinion on the application, merely provided a "what if" scenario regarding a pumping test for the second well.

I have now performed a more thorough evaluation of Las Animas, and applied the water availability methodology in a manner consistent with the way I have implemented it with other geohydrologic reports that have come before me. I have also conducted additional research into the geology and hydrology of the area, and reviewed submittals by both Dennis Cooper, consultant for the applicant, and Steven Finch, consultant for the protestors. The result is a reversal of my previous evaluation. For details, please see the attached report. In summary:

- The geohydrologic report and well logs do not support water availability for the proposed subdivision. At best, well 2812 could support a minimum lot size of 5 acres. As this is not the sole proposed water source for this subdivision, this MLS calculation cannot be applied to the entire property (i.e, I am not approving a water availability for the subdivision supporting a MLS of 5 acres).
- The two wells are dissimilar enough that the first pumping test is not applicable to the second well. If the applicant wishes to assert sufficient water availability and well productivity without impairment of nearby wells, they will need to conduct a pumping test and drawdown model for well 3364. Such a model needs to predict drawdown in both the subject well and the aquifer in surrounding properties.

If you have any questions, please call me at 992-9876 or email at swust.

REPORT REGARDING HYRDROGEOLOGY IN THE AREA OF THE PROPOSED LAS ANIMAS SUBDIVISION

Presented to CDRC

By Stephen Wust, Santa Fe County Hydrologist

I have examined the material submitted by Steven Finch of John Shomaker & Associates in opposition to the Las Animas subdivision application, as well as that submitted by Dennis Cooper, hydrology consultant to the applicant.

FINDINGS

1. Mr. Cooper contends that the sands are continuous across the property, and in communication, thereby providing sufficient water availability. Mr. Finch contends that the sands are lenses, and not in communication, severely reducing water availability. Budding (in Burck, 1972, Geologic Map of the Glorieta Quadrangle) describes of the Sangre de Cristo formation as primarily mudstone and shale with intercalated (interlayered) sandstones that are of limited extent, although he does not specify "limited". In my opinion, the sands probably interfinger, with variable communication. There is no way to resolve this issue for this location without conducting a pumping test of well 3364 (the second well).

2. Mr. Cooper contends that Ms. Yuhas, when she was County Hydrologist, agreed that no pumping test would be required for well 3364 (the second well). However, closer examination of the administrative record reveals that Ms. Yuhas only said that a pumping test would not be required *if* the well looked similar to well 2812 (the first well). She had left her County position by the time well 3364 was completed, and never rendered an opinion on whether a second test would indeed be required. I therefore conducted my own comparison of the two wells, and have concluded that the first pumping test is not applicable to the second well, for the following reasons:
   2.1. The two wells were completed differently. Well 2812 intercepted and was screened across multiple sands, so the results of the pumping test are not indicative of the productivity and effects of well 3364, which is screened across a single sand that is not definitively correlated with any of the screened sands in well 2812.
   2.2. The submitted report acknowledged very different productivities from the two wells.

3. Because of the likely scenario that a low permeability unit (shale, siltstone, mudstone) will act as an aquitard, if not aquiclude, limiting vertical water movement, I assume that water in sands that are above and separated by shale or mudstone from the top of the screen are not readily available to the well. I therefore recalculated the water availability from a more conservative standpoint, wherein I assumed that only units below the lowermost low

permeability unit above or at the top of the screen to TD provide water availability to the well. I utilized Mr. Cooper's SY, ST, RL, and RC in the calculations.

3.1. For well 2812, top of screen is within an arkosic sandstone unit. For the water availability calculation, I integrated those units below 245 feet, the base of the mudstone directly above this sandstone. From this:
  3.1.1. ST x SY = 7.65
  3.1.2. A = 0.061 ac-ft/acre at T = 100 years
  3.1.3. MLS = 4.10 acres at U = 0.25 ac-ft/lot

3.2. Alternatively for well 2812, if SY for mudstone = 0 (Mr. Finch's contention):
  3.2.1. ST x SY = 6.20
  3.2.2. A = 0.050 ac-ft/acre
  3.2.3. MLS = 5.04 acres

3.3. For well 3364, top of screen is within a shale & siltstone unit that Mr. Cooper assigns SY = 0, therefore I integrated those units below 350 feet (the base of the shale & siltstone unit). In this instance, that is a single sandstone at 350-370 feet. In this case:
  3.3.1. ST x SY = 0.8
  3.3.2. A = 0.006 ac-ft/acre
  3.3.3. MLS = 390 acres

4. Mr. Cooper's submittal dated 25 March 2004 calculated a 100-year 20-foot decline in surrounding wells due to pumping from the subdivision wells. He concluded that this is not a significant effect. I cannot concur with this conclusion, for two reasons:
  4.1. As no information was provided as to the available water column in surrounding wells, I cannot say whether a 20-foot drawdown is significant or not.
  4.2. The model was based on information derived from well 2812. As already stated, the pumping test for that well is not applicable to well 3364, therefore a model relying on the same aquifer characteristics applied to well 2812 and well 3364 will not necessarily provide a valid result as to drawdown effects.

CONCLUSIONS

1. A pumping test should be performed on well 3364, to demonstrate long-term production capability and aquifer extent.
2. With existing information, more realistic water availability calculations support no less than five acre minimum lot size on lots served by well 2812. However, because this well will not constitute the sole water source for this development, this MLS cannot be taken as the definitive calculation for this site.
3. Calculations on water availability from well 3364 do not support any development. These calculations may be modified with additional information from a pumping test.
4. Testing of well 3364 will also need to demonstrate no significant drawdown in the aquifer in surrounding properties.

JOHN SHOMAKER & ASSOCIATES, INC.
WATER-RESOURCE AND ENVIRONMENTAL CONSULTANTS
2703 BROADBENT PARKWAY NE, SUITE D
ALBUQUERQUE, NEW MEXICO 87107
(505) 345-3407, FAX (505) 345-9920

May 13, 2004

Stephen L. Wust, Ph.D.
County Hydrologist
Santa Fe County
205 Montezuma Avenue
Santa Fe, New Mexico 87501

RE: JSAI analysis of UP-3364 constant-rate pumping test for CDRC Case #S 03-5920
Las Animas Subdivision

Dear Dr. Wust:

Thank you for providing the results of the pumping test performed on Las Animas Subdivision well UP-3364 by Mr. Dennis Cooper. We have reviewed the test data and are providing the following comments and results.

1. The constant-rate pumping test on UP-3364 was performed by Mr. Cooper between April 19th and April 26th, 2004. It is unfortunate Mr. Cooper failed to notify us of the pumping test schedule, so we could have monitored some of the neighboring domestic wells during the test.
2. The pumping test was not performed at a constant rate, but at a reduced rate with respect to time. Mr. Cooper assumes the pumping rate averaged 5 gallons per minute (gpm) for the 48 hour pumping duration, but no pumping rate measurements or calculations were provided for the last 43 hours of pumping (90 percent of the pumping duration). It is likely the pumping rate slowly decreased over the last 43 hours of pumping, especially if no one was present to document the pumping rate.
3. Initially the well was pumped at a rate of 8 gpm, which resulted in a drawdown rate of 4.5 ft per minute. It appears the pumping rate was reduced by 40 percent so the well would not pump dry during the 48 hour pumping test.
4. The specific capacity of the well after 5 hours of pumping was 0.07 gallons per minute per foot (gpm/ft).
5. The pumping water levels tend to flatten out after the first hour of pumping, although increases in the rate of drawdown are noted after 21 hours and 48 hours of pumping (see attached graph).
6. The water level did not fully recover after 5 days. Mr. Cooper states the water level recovered to 2.5 feet below the beginning water level after 5 days of recovery. The inability of the water level to fully recover after 48 hours of pumping indicates the aquifer is limited in extent or by a barrier boundary.
7. The shape of the recovery water-level curve does not resemble radial ground-water flow in porous material, and appears to exhibit some characteristics of fractured rock. The flat recovery water-level curve from t/t' of <60 indicates there is a barrier boundary condition and very slow leakage back into the portion of the aquifer tapped by the well.

8. Using the drawdown slope for the initial pumping rate of 8 gpm, or the drawdown slope observed at the end of the pumping test results in a calculated transmissivity of 6 ft²/day. Mr. Cooper's transmissivity estimated from the part of the drawdown curve without documented pumping rate is 29.4 ft²/day.

Conclusions

1. Mr. Cooper's evaluation of the pumping test data overlooks key observations, and is based on assumptions where data were not collected.
2. This well is similar to well UP-2812 and is not the "gusher" well claimed by the representatives of the proposed subdivision. Furthermore, the similarity is based on the fact that when UP-2812 was pumped at rates greater than 10 gpm, the pumping water level was drawn down to the pump and the well dewatered, and that the calculated transmissivity and observed barrier boundary conditions are similar.
3. The test data for UP-3364 validates the analysis we provided in our March 18th and 29th evaluation letters. The water availability at the proposed Las Animas Subdivision is limited to discontinuous sandstone lenses of the Sangre de Cristo Formation. Both wells tested at the proposed subdivision show barrier boundary conditions in the aquifer.
4. Mr. Cooper failed to demonstrate that there is no significant drawdown in the aquifer in surrounding properties as requested in your April 5th, 2004 letter to Wayne Dalton. Merely the data were not collected. From the testing results from UP-2812 and UP-3364, it is obvious, for domestic wells in the region, the pumps have to be set at the bottom of the wells to pump at rates of 5 to 10 gpm. This indicates there is no available drawdown in neighboring wells to accommodate drawdown impacts from the proposed subdivision.
5. JSAI believes that there is not a long-term water supply available for the proposed subdivision, and we stand by our original Minimum Lot Size Calculation of 25 acres.

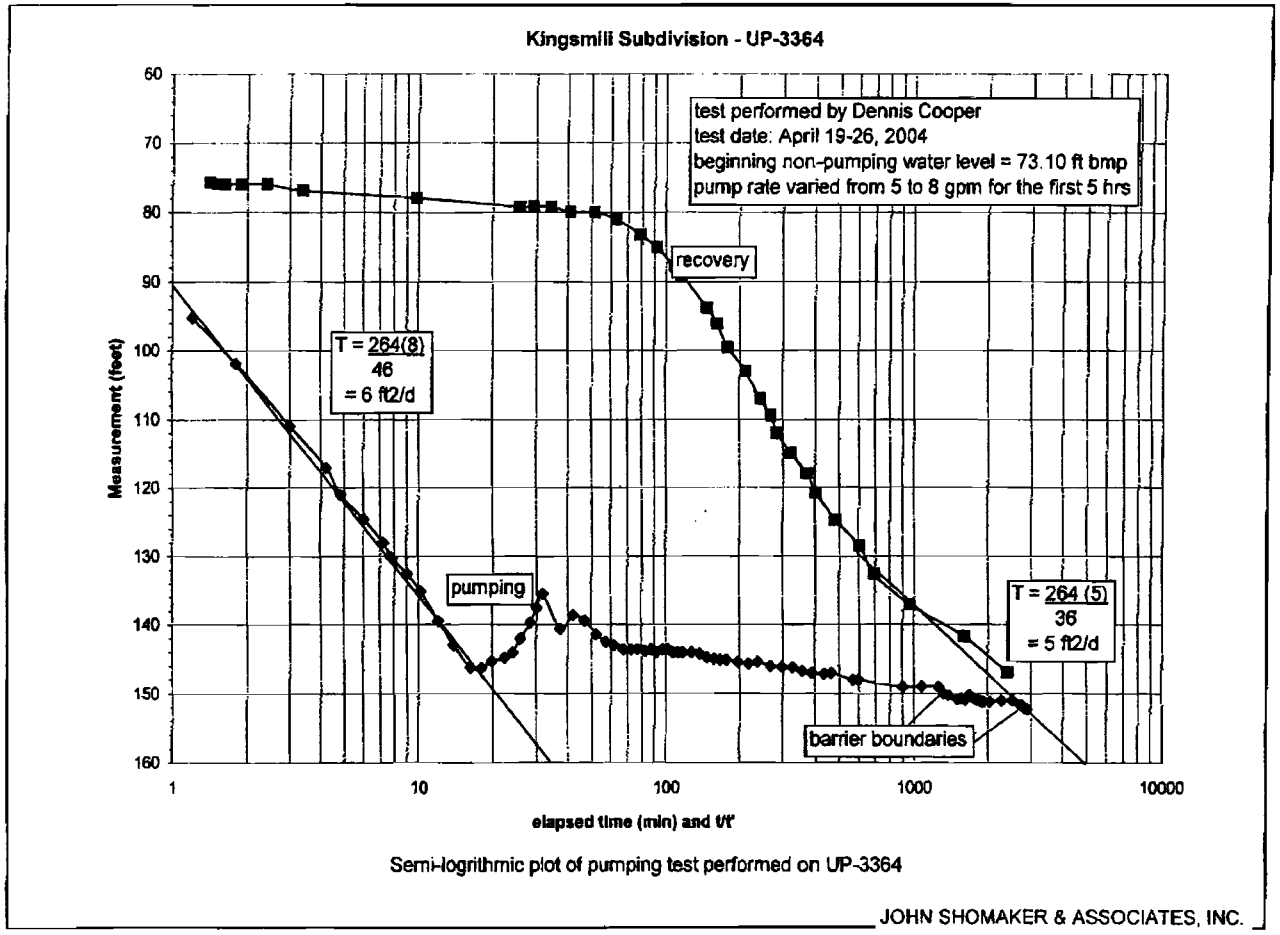
Sincerely,

JOHN SHOMAKER & ASSOCIATES, INC.

Steven T. Finch, Jr.
V.P. - Senior Geochemist/Hydrogeologist

STF:sf

cc: Bruce S. Garber, Esq.



Semi-logrithmic plot of pumping test performed on UP-3364

JOHN SHOMAKER & ASSOCIATES, INC.

UTILITIES DEPARTMENT

19 May 2004

TO: Wayne Dalton, Land Use Department
FROM: Stephen Wust, County Hydrologist
RE: CDRC Case #S 03-5920 Las Animas Subdivision

I have reviewed the submittals by both Dennis Cooper and Steven Finch regarding the recent pump test results for well UP-3364. The submittals included a response by Cooper to Finch's comments. I have also conducted my own research and consultation with outside hydrologists on the technical issues. In my opinion, the new data do not support the proposed subdivision.

- It appears, under the submitted plan, that this development is required to install a community water system, according to Article V Section 9.3.1 (Table 5.1). As such, the wells have not been completed to the standards for a community water system, nor have the appropriate submittals for a community water system been included (see Article VII Section 6.3). In addition, each pump test was 48 hours, while Article VII Section 6.4 Table 7.5 requires a 96 hour pump test for community wells.

- I agree with Mr. Finch that an even slightly higher pumping rate would most likely result in much more severe drawdown. The pump test results showed a much steeper drawdown during the short time the pumping rate was 8 gpm. It is particularly noticeable that the driller estimated 50 gpm yield for the well, but the pump test could manage no greater than 5 gpm.

- I question whether 5 gpm is sufficient for this well to supply the households for which it is proposed.

- Even at 5 gpm, the drawdown fell below the upper sands in the section. This confirms that these sands cannot be included in the water availability calculations. At best, if the pump test drawdown is used, the result is a minimum lot size of 5 acres. NOTE: I am not advocating 5 acre MLS, as I have questions regarding the long-term productivity of the well.

- At 5 gpm, the pump test demonstrated continued drawdown even after 48 hours. There was also not a full recovery after 48 hours. This suggests that the yield of the well is much less than that estimated by the driller, that the aquifer is of limited extent, and that the higher sands are not contributing to the water supply.

My conclusion is that the pump test has not demonstrated sufficient water availability to support the proposed development. At this time a conservative estimate would be 10 acre MLS, or five lots.

If you have any questions, please call me at 992-9876 or email at swust.