

Summary of Public Comments:

**From:** Jonathan Lupton  
**Sent:** Friday, April 29, 2011 2:09 PM  
**To:** "'vmcclendon@co.pulaski.ar.us'"@  
**Subject:** Lake Maumelle plan

I found a blooper. Page 15, bottom right. It repeats "to the"

CAW is building a new water main along Route 10 to connect to the to the Wye Mountain system.

My personal comments on the plan in general:

1. Allowing retail and office uses, and possibly even apartments, implies parking lots. I could be missing something, but I don't see anything addressing parking lots, despite their sizable impervious cover, and hence impact on drainage and erosion. I'd like to see limits both on parking lot size (the opposite of the old-style requirements for a minimum number of spaces), and a requirement for the use of permeable asphalt, concrete, etc. for parking lots where they are unavoidable.
2. I can't see how/why mining should be allowed at all. To me the term "generally prohibited" is too, well, general. How about just "prohibited?" The word "generally" allows some wiggle room; and even allowing variances is like screaming for somebody to start drilling for gas.

It was nice of you to ask for comments, and you may certainly disregard the rantings of a pointy-headed radical planner like me.

I appreciate all the hard work you and staff have put in on this plan. I'm not optimistic it will be enough to really save Lake Maumelle, but given the power of big money it may be the best we can expect in these environmentally bleak times.

I lived in Austin, TX, where there was a big push to protect the Edwards Aquifer. The year I moved away (1990), they were finding fecal matter reaching into Lake Travis despite supposedly strict low-density planning requirements to protect the watershed. Maybe some of us will live long enough to say "I told you so" when Central Arkansas drinking water quality is ruined 20-30 years from now.

Jonathan Lupton

**From:** Debbie Moreland  
**Sent:** Monday, May 02, 2011 6:24 PM  
**To:** Van McClendon  
**Subject:** Comments on Lake Maumelle Draft

Van,

I do have some comments to make regarding this draft. It infringes heavily on the private landowner's property rights without any form of compensation; i.e. mineral rights.

It might be more acceptable if concessions were made such as:

- 1) Reduced property taxes reflecting the impact on the landowners ability to full use of their land
- 2) Grant funds set aside to provide cost share to landowners to implement best management practices on their land

There are other areas which need to be clarified such as provisions for private landowners versus developers. They say the "devil is in the details" and there are a significant number of details which have not been identified so my comments are subject only to the current draft. I also wish to point out that I am in full agreement with the concept of safe drinking water but this has nothing to do with that. With current technology we can pull from the Arkansas River and make it safe to drink and has been used by several municipalities. This current issue is strictly about the landowner's loss of the full use of their land without compensation in any form. This is asking the landowners in this watershed to bear the full responsibility and/or sacrifice for the benefit of others. The question is how to mitigate this loss.

debbie moreland  
(501) 425-2891

**From:** Martin Maner, Central Arkansas Water

These are my comments on the April 2011 draft Land Use Plan, solely as Director of Watershed Management for Central Arkansas Water, and do not constitute the CAW or Board's final opinion.

First, I concur with Van's email below.

Regarding Van's comment number 3, perhaps a way to address land application of waste would be to not allow any land application of the prohibited uses as is currently permitted by the Arkansas Department of Environmental Quality. When I was at ADEQ, either as a permit engineer, Assistant Chief of the Water Division, or as Chief of the Water Division, I was involved in permitting these types of operations. ADEQ permits the land application of animal waste (excluding certain forms of chicken litter, which I would suggest should not be land applied either), food waste, chicken hatchery waste, drilling fluids, and other types of waste material. The section on prohibited uses in the final draft currently states "Waste collection or processing...". I would suggest that "Land application" be added in addition to waste collection or processing. I would also suggest you add "storage" since outdoor storage of these materials could be a source of contaminants.

Other than that, it looks good. It has 1) a minimum undisturbed requirement that is necessary if a development proposes to use BMPs, 2) it more clearly defines the difference between open space and undisturbed areas compared to earlier versions, 3) it requires the SET be met, 4) it proposes prohibited uses, and, 5) provides for stream side buffers.

I wanted to get these to you because I will be out of the office all next week, as required by the utilities mandatory "five day away" policy.

With Best Regards,  
Martin  
Martin Maner, P.E.  
Director of Watershed Management  
Central Arkansas Water  
martin.maner@carkw.com  
501.377.1268 Office  
501.377.1244 Fax  
221 East Capitol Ave.  
P.O. Box 1789  
Little Rock, AR 72203

**From:** Atlas Smith  
**Sent:** Tuesday, May 31, 2011 10:41 AM  
**To:** Van McClendon  
**Cc:** martin.maner@carkw.com  
**Subject:** Lake Maumelle Water Shed - Land Use Plan

Van,  
I am a life long resident of western Pulaski County. I am privileged to own 100 acres of what I consider to be a gift from God and have treated it as such all my life. My land is divided by the Big Maumelle River, 1/2 of my property is on the north side of the river and 1/2 is on the south side. My property is 6 miles upstream from Lake Maumelle. My request is simple, that I am allowed to continue to work my farm as my father and his father did and that I maintain the same rights and privileges as they had. My wife and I wish to build a home on this property, close to the river but safe from flooding. The proposed Stream Corridor Protections could prohibit our home construction in the desired location. Further it could prohibit, in part, my farming practices and maintaining the river bank as my family has for many years. I therefore object to stream corridors or "buffers" being part of this land use plan or any ordinance. I don't feel these requests are unreasonable from a good steward of the land that lies within the Lake Maumelle Water Shed.  
I invite you to visit my property and allow me to show you what I think is special about it.

Atlas Smith  
46825 South Highway 10  
Perryville, AR 72126

**From:** Barry Haas  
**Sent:** Tuesday, May 31, 2011 3:26 PM  
**To:** Van McClendon  
**Subject:** Comments on Draft Land Use Plan for the Lake Maumelle Watershed

Mr. Van McClendon, Director  
Pulaski County Planning & Development  
200 Brown Street  
Little Rock, AR 72204

Dear Van,

Here are my comments re the Draft Land Use Plan for the Pulaski County portion of the Lake Maumelle watershed (page numbers are from the April 5, 2011 Draft):

- 1) Page 37, Permitted Uses, Non Residential- when I met with you and Wallace Roberts Todd folks the morning after the public meetings, I asked about the 25 square feet for local-serving commercial and retail uses per each permitted residential dwelling figure. That section was not included in previous drafts, and I wanted to understand where that figure came from and whether it seemed reasonable. Having heard comments from you and WRT that morning, I am comfortable with the inclusion of that section and language.
- 2) Page 39, Chart of Gross Density- when we met I also asked about the bare minimum undisturbed area allowed under the Draft Land Use Plan assuming a developer elected to take advantage of one or more 'bonuses' (e.g., collecting and pumping wastewater out of the watershed). The response I got that morning was that 35% is the bare minimum undisturbed area no matter how many bonuses a developer qualifies for. That figure of 35% undisturbed area needs to be clearly defined in adjacent text in conjunction with the Gross Density figures on page 39.
- 3) Page 39- we also talked about the term "undisturbed open" or "undisturbed open space". In my opinion average folks will be totally confused by this terminology as defined in the Draft Land Use Plan. Undisturbed needs to be truly undisturbed- forest land that is left alone with the possible exception of professional management techniques like prescribed burns to improve the forested acres ability to filter or retain pollutant runoff into Lake Maumelle. Note: I appreciate the Draft Land Use Plan is not a regulatory document and the Pulaski Co. Quorum Court will have to pass an ordinance to give the Land Use Plan legal status. Still, language in the Draft Land Use Plan that is not carefully crafted may confuse not only the public which is very interested in protecting Lake Maumelle water quality but may also tend to confuse Quorum Court members who do not have a good base of knowledge regarding the terminology in the Land Use Plan. I therefore strongly urge you and WRT to ensure such terms as "undisturbed open space" are defined to mean what the average person believes those words to mean.
- 4) Page 42, Prohibited Uses- subsequent to meeting with you I learned of a possible high voltage electric power line that could be routed through the Lake Maumelle watershed. I request that you add "high voltage electric power lines" to the list of prohibited uses. This possible high voltage electric line may have a cleared right-of-way as wide as 140'. This ROW would most likely be kept clear of growth using chemical means. We do not need either such deforestation or herbicides on a large scale in the Lake Maumelle watershed. Prohibiting high voltage electric power lines in the watershed will prevent that from happening.
- 5) Page 46, Viewshed Protections- I know Central Arkansas Water's position regarding Viewshed Protection is that it doesn't impact Lake Maumelle water quality. No one can argue that fact. But if Viewshed Protection is included, and I believe it should be, my comment when we met was on the sentence: "The maximum height of any building structure shall be 36 feet **as measured from the lowest floor finish grade** [emphasis added] ... ". As an example I told you about our house which sits on ground that slopes enough that our main level is on grade in the front and basement or lower level is on grade out back- in other words a slope of one story from front to back of our house. My comment was that the language "lowest floor finish grade" might allow a developer to take advantage of that phrase to ultimately build a taller structure than you think possible by not finished the floor on a lower level (i.e., an unfinished basement). I ask you to revisit that phrase and make sure it says precisely what you need it to say to offer the level of Viewshed Protection that is warranted.

Finally and unrelated to the Draft Land Use Plan, my understanding from you, WRT and CAW is that the already enacted Chapter 8 of the Pulaski Co. Subdivision Regulations along with the Site Evaluation Tool is what ensures the total pollutant load for the Pulaski Co. portion of the Lake Maumelle watershed at buildout will not exceed the water quality indicators (phosphorous, total organic carbon and total suspended solids) in CAW's Lake Maumelle Watershed Management Plan. I hope that holds true over time as 400,000

people in central Arkansas are relying on Pulaski Co. government and Central Arkansas Water to protect their drinking water. I cannot think of another single issue that will come before the Pulaski Co. Quorum Court that affects anywhere close to this number of people on literally a daily basis. Water sustains our life and high quality water sustains a high quality of life. Please do your very best to ensure your legacy is a very high quality water supply for generations to come.

Sincerely,  
Barry Haas  
804 Konrad Court  
Little Rock, AR 72223-9201

**From:** Kathy Wells  
**Sent:** Tuesday, May 31, 2011 11:54 PM  
**To:** Van McClendon  
**Cc:** CLRN WEB site; DNA WEB site  
**Subject:** Coalition comments on Land-use Plan for Maumelle Watershed: analyze policies, assure water quality

**Coalition of Greater Little Rock Neighborhoods**  
An Advocate of Quality City Neighborhoods  
<http://groups.yahoo.com/group/LRNeighborhoods>

President Kathy Wells  
Box 777, Little Rock, AR 72203  
960-6918

Treasurer Allan Ward  
6609 Sherry Dr., Little Rock, AR 72204  
664-5921

May 31, 2011  
Van McClendon  
Director, Pulaski County Planning & Development Dept.  
Via Email

Dear Van,  
The Coalition applauds the policies contained in the Apr. 27, 2011 proposed Land Use Plan for the Maumelle Watershed, aimed at protecting our drinking water from pollution due to excessive development around Lake Maumelle. We look forward to the ordinance to come that will put teeth into these protections. Only when our county officials enact an ordinance requiring developers of new subdivisions to meet water-quality standards in their construction will the 400,000-plus consumers of Central Arkansas Water utility get the assurances so badly needed.

Has TetraTech, the utility consulting firm, analyzed these policies, to check whether these meet the standards of the Watershed Management Plan? Our political will to protect our drinking water remains our most important protection. If these Apr. 27 policies were enacted into an ordinance, would the water-quality standards of the Watershed Management Plan be met?

The new Plan states that commercial retail development is allowed in a subdivision at the rate of 25 square feet per housing unit appears to be a useful tool in guiding the sizes of stores wanted next to houses. This had not been given any number or size before, and we welcome clarity.

The Apr. 27 revision fixes an important standard - that Undisturbed Open Space means just that - never cut or cleared. Replanted road shoulders and recreation fields are another category, now labeled Disturbed Open Space. Uncleared acres hold back pollution, as Nature's filter.

We hereby object to a proposed high-voltage electric transmission line under consideration to convey Oklahoma wind-farm power to the Tennessee Valley Authority, potentially across our Watershed. Wherever that power line runs, chemicals will suppress all vegetation around it, in a swath up to 140 feet wide. Keep that away from our drinking water, please, and make this a Prohibited Use. Cleanline Energy Partners LLC is the firm investing in this project, and meeting with Arkansas officials and others to get support for this proposal.

Yours Truly,  
Kathy Wells  
President

**From:** David Anderson  
**Sent:** Tuesday, May 31, 2011 3:26 PM  
**To:** Van McClendon  
**Subject:** Comments on Draft Land Use Plan for the Lake Maumelle Watershed

05/31/2011

I'm a bit concerned that this Comprehensive Land Use Plan has any scope as to what Low Impact Development strategies will be recommended, or whether there will be any in place as development mandated code. Judging from the images in the presentation, there are no LID strategies planned, and seeing that piping the water off site is the preferred method, all signs point to no regard for real LID.

LID is a hydrologic function, designed to conserve and enhance the predevelopment watershed. Such a development as what is proposed in this project would make quite a large impact from it's current, natural landscape, and therefore is not following the LID intention. If there are more details to be released, I understand, but please inform the public through proposed plans what your true intentions behind LID really are. Simply preserving a small portion of tree canopy around the lake will do very little in terms of treating and keeping our drinking water safe.

Cited from the Center for LID, in summary: Low Impact Development emphasizes the integration of site design and best management practices (BMPs) that conserves the natural systems and hydrologic functions on that site. Two main focal points include protecting natural systems and processes (drainage ways, vegetation, soils, and sensitive areas) and eliminating and micromanaging stormwater at its source, (or providing pointsource solutions like stormwater rain gardens at the stormdrain inlets, constructed wetlands, or even understanding the role of wetlands in this system). There are many Benefits, here are just a few:

-Municipalities:

Balance growth needs with environmental protection.  
Reduce municipal infrastructure and utility maintenance costs (streets, curbs, gutters, sidewalks, storm sewer).

-Developers:

Potentially reduce infrastructure costs.  
Reduce stormwater management costs.  
Increase lot and community marketability.

-Environment:

Preserve integrity of ecological and biological systems.  
Protecting the site and regional water quality by reducing sediment, nutrient, and toxic loads to water bodies.  
Reducing the impact to local plants and wildlife.

I would like to make one thing clear, any project that is focused on developing near a preserved natural resource such as our drinking water reservoir, should take the ideas and concepts of LID very seriously, and make a conscious decision to treat stormwater onsite, at the source, and/or in your front yard. Improper storm water management around a watershed like this would damage our drinking water in very little time, and the need for an energy intensive means of water treatment will be necessary, very expensive, and unhealthy.

When figuring the details for on-site management, consider the predevelopment Hydrology and try to protect what it currently is. Maintain and preserve each one of those natural bioswales and runoff areas by adding and enhancing the water without harming through culvert and concrete infrastructure. Soft infrastructure is the answer, providing habitat co-existence and healthy ecosystems. Conventional methods of water management are outdated and harmful to the environment. We've all seen increased flash flooding and overflows. This is not because of excess of rain, but because our ground has become increasingly unabsorbant. If water were designed to work for us instead of against us, then we would be working out a true LID design.

First recognize that what you are planning to do on top of Lake Maumelle is a huge and dirty impact. The second thing you can do is propose actual LID strategies in your plan, and describe how stormwater and waste water will be managed with a low impact, natural system.

When asking a friend who designs LID neighborhoods, he commented "This plan does not arrive at any design conclusions, it does not work with the place. Its like a suburban zoning document that doesn't take the site into account. It lacks goals and solutions that go beyond the most standard. In the case of such a nice lake, this is unforgiving."

I agree and feel that there needs to be some description and a real understanding into what is "LID" planned development. If you would like to discuss LID design and intention a little more with me, please understand we are currently trying to get this to be a reality in Central Arkansas, and would certainly appreciate it if LID described projects would actually be and do what LID projects are designed to accomplish.  
Thanks



David Anderson

Pulaski County Portion of Lake Maumelle Watershed  
Land Plan Draft Comment

güis  
design cooperative

**From:** Stephen Giles  
**Sent:** Tuesday, May 31, 2011 5:59 PM  
**To:** Van McClendon  
**Subject:** Alotian

The Law Firm of  
**Stephen R. Giles**  
A Professional Association

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May 31, 2011

**Via E-Mail**

Mr. Van McClendon  
Director  
Department of Planning and Development  
3200 Brown Street  
Little Rock, AR 72204

Re: Lake Maumelle Watershed Management Plan

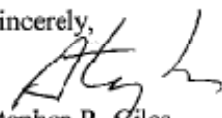
Dear Van:

On behalf of the Alotian Golf Club ("Alotian"), I would like to express appreciation to the Pulaski County Planning Staff and the WRT consultant team for a very fine job working with the Task Group for Lake Maumelle Watershed Management in conjunction with Central Arkansas Water ("CAW").

We feel that Alotian represents a shining example of private development that has voluntarily adopted watershed management in the design and operation of the 18 hole golf course and related facilities located on 300 acres within 1,125 acres of its property. In late 2004, Alotian granted a Conservation Easement to the University of Arkansas Foundation on 875 acres of its property to develop agricultural-based programs such as water quality, wildlife, turf grass, and forestry management. Alotian also enjoys a great relationship with CAW with which it has executed a Memorandum of Understanding dated June 13, 2002. CAW routinely inspects for water quality within and around the Alotian property and has had no serious issues since the adoption of the MOU.

Thank you again for all of your efforts in advancing the land use plans and regulations for the Lake Maumelle Watershed.

Sincerely,

  
Stephen R. Giles

**From:** Chuck Nestrud  
**Sent:** Tuesday, May 31, 2011 4:40 PM  
**To:** Van McClendon  
**Subject:** Comments on Draft Land Use Plan

**CHISENHALL, NESTRUD & JULIAN, P.A.**

ATTORNEYS AT LAW  
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May 31, 2011

PULASKI COUNTY PLANNING AND DEVELOPMENT  
VAN McCLENDON - DIRECTOR  
3200 Brown St  
Little Rock, AR 72204

Re: Draft Land Use Plan

Dear Mr. McClendon:

Please consider this letter and the attached memoranda from Wright Water Engineers and Design Studios West as comments on behalf of Deltic Timber Corporation (Deltic) on the latest draft Land Use Plan for the Maumelle Watershed in Pulaski County. From the outset Deltic has stated that it would support a land use plan that is fair (treats all landowners equally), protects property values (preserves development potential to its highest best use), protective of water quality, and based on the best science available. However, to date the land use plans as drafted do not achieve these objectives. Additionally, without the benefit of any of the proposed regulatory control ordinance language it is not possible to assess with any degree of certainty how the land use plan may be implemented. Accordingly, at this time Deltic cannot support the land use plan as currently drafted.

**All Property Owners Should be Treated the Same.** The county's existing regulatory program for water supply protection is based upon the adopted loading rates for phosphorus, total suspended solids, and total organic carbon; loading rates which apply uniformly to each acre of land within the watershed. Changes in land use that have an impact on the loading rates are the focus of Chapter 8 of the Subdivision Ordinance and SET; i.e. proposed changes in the existing land use from timber to meadow or lawn, adding impervious surfaces such as additional rooftop areas, driveways, roads, etc. Every acre of land has the same impact on the water supply, and should be regulated the same with respect to water supply protection. Any land use plan/zoning regulatory program that treats some land different from others cannot be supported from a water supply protection standpoint, and places unfair, disproportionate burdens upon landowners.

**Use the Best Science Available.** The modeling performed by Tetra Tech that is the basis for the Watershed Plan, the County's subdivision ordinance (and SET) and the proposed land use plan was developed five years ago with a limited dataset (for example, just one flow measurement gage was used to calibrate the model and of the three precipitation gages used for data, two are located outside the watershed). USGS (with financial support from CAW) has now completed a new lake model which is more up to date and was developed with more

CHISENHALL, NESTRUD & JULIAN, P.A.  
Comprehensive dataset (five flow gages, all in the watershed, were used for model calibration along with the NEXRAD data for the precipitation dataset). No further regulatory initiatives should be initiated that are not based on the latest, most up to date modeling, and the existing regulatory programs should be re-evaluated in light of this new science. It is certainly premature to develop a comprehensive land use plan based on water quality projections from the older model for development scenarios that will roughly take 100+ years to occur.

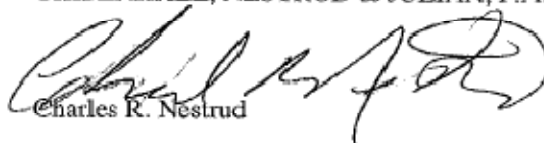
**Any Land Use/Zoning Regulatory Program Should be Limited to What is Necessary for Protection of the Water Supply.** The land use/zoning activity is limited to that portion of Pulaski County located in the Lake Maumelle watershed. The stated purpose of this exercise was to expand upon Chapter 8 of the Subdivision Ordinance to provide important water supply protection features that were not included in the Subdivision Ordinance. CAW's comments on the current draft land use concepts identify CAW's objectives for the land use/zoning regulations, and those objectives relate solely to water supply protection. Land use planning and associated land use restrictions unrelated to water supply protection should not be part of this exercise. For example, land uses that are permitted elsewhere in the county should not be prohibited in the watershed if such land uses are compatible with and can meet the water supply protection requirements; i.e. the loading rates. All land use/zoning proposals that are unrelated to water supply protection should be specifically identified so those provisions can be debated outside of the water supply protection discussion.

We appreciate the work that has been done to develop a draft land use plan. It is practically unprecedented to develop a land use plan that addresses over 50,000 acres and attempts to define development patterns that will not materialize for 50-100 years. For example, the major landowners whose property will be developed through subdivision are already subject to a level of regulation that will protect the water supply. According to the USGS modeling, 10,000 acres can be converted to residential real estate with little impact upon water quality, and 10,000 acres of residential real estate development in the Lake Maumelle watershed will likely take many decades to occur. It may simply be premature to engage in comprehensive land use planning, since the science is still evolving and there is no identified water quality issue that needs to be addressed in the foreseeable future. Deltic continues to support a limited land use ordinance that prohibits certain uses in the watershed that are not compatible with a public water supply, and is prepared to continue to work with the county to flesh out the science and at the appropriate time develop a comprehensive land use plan for the Maumelle watershed that achieves the objectives stated above.

Thank you for providing the opportunity to comment on the draft Land Use Plan.

Yours very truly,

CHISENHALL, NESTRUD & JULIAN, P.A.

  
Charles R. Nestrud

CRN/seh

**WWE**  
**MEMORANDUM**

---

**To:** Chuck Nestrud, Esq.  
Chisenhall, Nestrud & Julian, P.A.  
**Via Email**

Tim Daters, P.E.  
White-Daters & Associates

**From:** Wright Water Engineers, Inc.  
Ian Paton, P.E., CFM  
Jonathan E. Jones, P.E., D.WRE

**Date:** May 31, 2011

**Re:** Comments on the Pulaski County Draft Land Use Plan  
for the Lake Maumelle Watershed

This memorandum provides comments from Wright Water Engineers, Inc. (WWE) on the Pulaski County Comprehensive Land Use Plan and Land Use Controls for the Lake Maumelle Watershed (Draft), dated April 5, 2011 (hereafter referred to as the "Draft Land Use Plan"). The focus of these comments is on those aspects of the Draft Land Use Plan related to protection of water quality.

The comments are grouped into the following categories:

- Water Quality Modeling Studies—Comments are provided on two separate computer modeling studies on water quality in the Lake Maumelle watershed. The studies were conducted by: i) Tetra Tech (on behalf of Central Arkansas Water [CAW]), and ii) the United States Geological Survey (USGS) (also on behalf of CAW).

A discussion of the modeling studies is central to any review of the Draft Land Use Plan. Results from one of the studies (the Tetra Tech model) and its associated Site Evaluation Tool (SET) are currently being used as the underlying basis for many of the land use requirements described in the Draft Land Use Plan, including determination of maximum permitted impervious cover and minimum undisturbed open space requirements.

- Draft Land Use Plan—Comments are provided on specific sections of the Draft Land Use Plan that address water quality protection and use of the SET to determine compliance with land use requirements.

A summary of key points is provided below. The summary is followed by an expanded discussion with references.

## **SUMMARY OF KEY POINTS**

### **Water Quality Modeling Studies Related to the Draft Land Use Plan**

1. Two independent computer modeling studies of water quality in the Lake Maumelle watershed, both conducted for CAW, produced different results in terms of the impacts caused by development. This raises the question of which model results are most appropriate to use.
2. There are several factors which suggest that the USGS study should be considered the preferred source of information for projecting future water quality conditions in the Lake Maumelle watershed.
3. The buildout scenarios for the computer modeling studies are very long term (roughly 100 years). The extended time frame of the model scenarios increases the uncertainty of the model predictions. Both models were run for relatively short simulation periods, with the USGS model being run for four years and the Tetra Tech model being run for less than three years. Extrapolating results of short modeling runs as the basis for long-term land use planning inserts uncertainty into the process. These uncertainties should be acknowledged by the current planning and regulatory strategies, which should be flexible and adaptive and not unnecessarily restrict land use options.
4. The current water quality in Lake Maumelle is very good, despite the long-term impacts of extensive historic timbering practices in the watershed along with roads, utilities, and some farming and residential development. This provides a reference for potential water quality impacts from other types of activities in the watershed, such as increased residential development.

### **Draft Land Use Plan**

5. The Draft Land Use Plan clearly indicates that it is supplemental to the water quality protection measures controlled via the SET and numerous references to SET are made throughout the Plan. This reinforces the need for the Draft Land Use Plan to reference a SET for which underlying questions about its modeling basis have been resolved.
6. The Draft Land Use Plan has a sliding scale of mandatory open space requirements, regardless of SET results. This approach contradicts a large body of work previously adopted by the County, including the Subdivision Ordinance, and there is no technical foundation for this requirement.
7. The Draft Land Use Plan incorrectly suggests that the densities prescribed are consistent with the densities that SET would allow.

8. The Draft Land Use Plan proposes fixed width stream buffers, which, from a technical perspective, is not the preferred solution for stream corridor protection when compared to variable width buffers or a fixed inner buffer with a variable width outer buffer.
9. The Draft Land Use Plan proposes "half credit" for undisturbed open space on private property. This discourages the creation of open space on private lots and does not have a technical basis.
10. There is a contradiction between the 1,500-acre CAW set-aside (to offset impacts from selected properties) and an "Overarching Goal" of the Watershed Management Plan, regarding fairness to all parties. Failure to regulate all property owners in the same manner is not consistent with the goal to equitably share the burden of protecting the lake, and creates the potential for small, unregulated properties to compromise the quality of the lake, even with compensatory land set-aside.

## **COMMENTS ON WATER QUALITY MODELING STUDIES RELATED TO THE DRAFT LAND USE PLAN**

### **1. Two independent computer modeling studies of water quality in the Lake Maumelle watershed, both conducted for CAW, produced different results in terms of the impacts caused by development. This raises the question of which model results are most appropriate to use for determining land use controls.**

The two modeling studies have both been conducted on behalf of CAW to estimate the projected water quality impacts caused by future development in the Lake Maumelle watershed. These studies, one by Tetra Tech and one by the USGS, have results that vary widely. Currently, only the Tetra Tech model results are being used as a basis for the land use regulations incorporated into the Draft Land Use Plan.

The Tetra Tech model was developed in 2006 for the Lake Maumelle Watershed Management Plan (Tetra Tech, 2007). Results from this model serve as the basis for the nutrient loading limits in the Pulaski County Subdivision Ordinance and the SET. The SET is referenced throughout the Draft Land Use Plan as the tool that must be used to determine the amount of maximum permitted impervious cover and the minimum undisturbed open space. The SET calculates these land use requirements based on compliance with the nutrient loading limits.

The Watershed Management Plan states, "Model predictions indicate big impacts are likely..." and future water quality conditions are not predicted to meet specified water quality targets for the lake under either of the buildout scenarios evaluated with the Tetra Tech model. The water quality parameters identified as not likely meeting target levels include chlorophyll *a* (an indicator of algae), Total Organic Carbon (TOC), and secchi depth (an indicator of water clarity).

In contrast to the Tetra Tech model and the Watershed Management Plan, the USGS modeling report, completed in 2011, states that their low intensity urban development scenario "... resulted in slight changes in simulated water quality for Lake Maumelle, relative to the baseline condition, for most of the reservoir." (USGS, 2011 a)

There are distinct differences between the results of the Tetra Tech and USGS modeling studies in terms of the projected impacts that development will have on water quality in the watershed. These differences can be attributed in part to variability in the development scenarios evaluated by the two studies. Nevertheless, these differences have important implications, since the model results are the basis for SET and the land use regulations. This raises the question of which model results are most appropriate to use for determining land use controls.

**2. There are several factors which suggest that the USGS study should be considered the preferred source of information for projecting future water quality conditions in the Lake Maumelle watershed.**

Favorable attributes of the USGS model include the following:

- Stream flow model calibration - The USGS model has the benefit of a more extensive dataset for calibration compared to the Tetra Tech model (for example, the USGS HSPF model calibration is based on five stream gages versus one gage for the Tetra Tech model).
- Precipitation model calibration - The USGS precipitation dataset uses NEXRAD data versus three precipitation gages for the Tetra Tech model (two of which are outside the watershed).
- Model simulation period - The USGS model simulation period is for four years of data (from 2005 through 2008). (Note: The USGS indicates that the results from their modeling should not be considered outside of the context of the 4-year model simulation period [USGS, 2011c]).

The Tetra Tech model simulation period is shorter, as it is based on a simulation period of less than 3 years (from January 2002 to September 2004) (Tetra Tech, 2006). Although the model simulation period is shorter than for the USGS model, the Tetra Tech model has been used as the basis for the site-scale pollutant allocation values for roughly 100 years of new development in the Subdivision Ordinance.

- Study review and response - Recent comments and criticisms from Tetra Tech regarding the USGS model were addressed in a comprehensive response prepared by the USGS (USGS, 2011b).
- 3. The buildout scenarios for the computer modeling studies are very long term (roughly 100 years). The extended time frame of the model scenarios increases the uncertainty of the model predictions.** Both models were run for relatively short simulation periods, with the USGS model being run for four years and the Tetra Tech model being run for less than three years. Extrapolating results of short modeling runs as the basis for long-term land use planning inserts uncertainty into the process. These uncertainties should be acknowledged by the current planning and regulatory strategies, which should be flexible and adaptive and not unnecessarily restrict land use options.

The worst case development scenario modeled by Tetra Tech (i.e., the development scenario with the largest increase in phosphorus loads) is Scenario 2 in the Baseline Modeling Analysis (Tetra Tech, 2006). Scenario 2 involves development of nearly 52,000 acres, or nearly twice the amount of private land in the watershed in Pulaski County (WRT, 2011). Per the Watershed Management Plan, buildout to this extent is projected to take approximately 30 years for the areas surrounding the lake and 50 to 100 years for the rest of the watershed (Tetra Tech, 2007). There is high degree

of uncertainty associated with these long-term time development projections, which translates to uncertainty with the model results.

Similarly, the USGS model projections are based on development occurring on large areas of land, which will require an extended time period to occur. The USGS model involves converting approximately 10,535 acres into low intensity urban development (USGS, 2011a). That is the area of all the private land in Pulaski County with a slope less than 25 percent (not including land owned by timber companies).

The uncertainty of these long-term buildout scenarios, and the transfer of that uncertainty to model predictions of future water quality impacts, should be acknowledged in terms of how current development is regulated. It is essential that the land use planning and regulatory strategies for the watershed be flexible and adaptive.

- 4. The current water quality in Lake Maumelle is very good, despite the long-term impacts of extensive historic timbering practices in the watershed along with roads, utilities, and some farming and residential development. This provides a reference for potential water quality impacts from other types of activities in the watershed, such as increased residential development.**

Current phosphorus loads to Lake Maumelle are relatively small and the existing water quality in the lake is good (Tetra Tech, 2006, and Tetra Tech, 2007). This is the condition of the Lake Maumelle watershed, despite commercial timbering activities occurring in the watershed for decades. This provides an understanding of the long-term impacts to the lake resulting from specific types of activities occurring in the watershed. It also provides insight regarding the potential long-term impacts from residential development, since such development, particularly if designed to be protective of water quality, could be expected to cause impacts no greater than timbering (USGS 2011a).

USGS model results for both a timbering and a development scenario indicate slight changes to water quality in Lake Maumelle. The low-intensity development scenario (Scenario 2) affected approximately 12 percent of the watershed. The clearcut timbering scenario (Scenario 3) affected approximately 6 percent of the watershed

## COMMENTS ON THE DRAFT LAND USE PLAN

5. **The Draft Land Use Plan clearly indicates that it is supplemental to the water quality protection measures controlled via the SET and numerous references to SET are made throughout the Plan. This reinforces the need for the Draft Land Use Plan to reference a SET for which underlying questions about its modeling basis have been resolved.**

Examples of key references to the SET in the Draft Land Use Plan are listed below.:

- **p. 1, last paragraph:** "... propose a regulatory structure [for the Land Use Plan] supplementary to the subdivision controls and SET."
- **p. 3, Purpose and Objectives, Objective 2:** "The Plan and its associated regulations must be consistent with the County's adopted SET and Subdivision Code."
- **p. 19, Regulatory Context:** "Pulaski County has not adopted zoning. Land development is currently regulated, and enforced primarily through the Pulaski County Subdivision and Development Code, the Stormwater Management Drainage Manual and Site Evaluation Tool (SET), and the Pulaski County Floodplain and Flood Damage Prevention Ordinance."
- **p. 33, Coordination with the Subdivision and Development Code and the Site Evaluation Tool:** "The Land Use Plan complements, rather than duplicate(s) or replace(s), the Subdivision and Development Code and the SET."
- **p. 33, Coordination with the Subdivision and Development Code and the Site Evaluation Tool:** "...in cases where the amount of undisturbed open space required by the application of the SET is greater than that required in the baseline open space requirements in the Low Impact Planned Residential Development (LIPRD) land use district, the Plan defers to the SET."
- **p. 35, Simplicity and Ease of Administration:** "...with the exception of provisions to limit building height and to prevent building placement directly on ridgelines in order to protect the watershed's scenic character, the development standards recommended to implement the Land Use Plan are those already in force through the Subdivision Ordinance and the application of the Site Evaluation Tool (SET)."
- **p. 36, Village District (V):** "Open Space: As required by the Subdivision Code and the application of the SET; Impervious Cover: As required by the Subdivision Code and the application of the SET."
- **p. 37, Low Impact Planned Residential Community (LIPRD):** "Projects will incorporate protected open space and conservation development practices, as

determined by application of the SET, as well as minimum open space standards in accordance with the 'sliding scale' of density described below."

- **p. 40, Site Evaluation Tool Application [for LIPRD]:** "The undisturbed open space requirements of both the SET and the sliding scale must also be calculated, and that which requires the greater amount of undisturbed open space shall apply."
- **p. 41, Non Residential Zone:** "Open Space: As required by the Subdivision Code and the application of the SET; Impervious Cover: As required by the Subdivision code and the application of the SET."

**6. The Draft Land Use Plan has a sliding scale of mandatory open space requirements, regardless of SET results. This approach contradicts a large body of work previously adopted by the County, including the Subdivision Ordinance, and there is no technical foundation for this requirement.**

The Draft Land Use Plan states that the open space requirements for a land parcel being developed must be the greater of the open space sliding scale values specified in the Draft Land Use Plan versus the open space requirements calculated in SET (WRT, 2011).

This proposed approach contradicts the "Performance Standards Approach for Achieving Surface Runoff Loading Rates" described in the Subdivision Ordinance (Pulaski County Development Code, 2009). This proposed approach also contradicts previous work done by the County regarding implementation of the SET (Pulaski County, 2010a, and Pulaski County, 2010b) and is inconsistent with the goals outlined in the Lake Maumelle Watershed Management Plan (Tetra Tech, 2007).

**7. The Draft Land Use Plan incorrectly suggests that the densities prescribed are consistent with the densities that SET would allow.**

The Draft Land Use Plan suggests that the proposed densities are consistent with those typically achievable in SET (WRT, 2011). However, SET provides flexibility to incorporate multiple BMPs, such that densities substantially higher than those prescribed in the Draft Land Use Plan can still be compliant with the allowable loading rates.

**8. The Draft Land Use Plan proposes fixed width stream buffers, which, from a technical perspective, is not the preferred solution for stream corridor protection when compared to variable width buffers or a fixed inner buffer with a variable width outer buffer.**

Stream buffers are an effective control measure to protect water quality. Site-specific buffer widths that vary as a function of several factors (e.g., slope, vegetation cover, adjacent land use, etc.) are more scientifically defensible than fixed width approaches.

The fixed buffer width approach, while easy to understand and not disposed to raising questions about fairness or selective treatment, may have little correlation to the environmental protection

requirements of a specific site. The resulting fixed buffer width may be oversized in one location and undersized at another location. As a result, the fixed width approach can preclude types of development that serve as an amenity to the community (e.g., streamside trails, boardwalks, or commercial areas that have connections to stream corridors [such as restaurant patios, etc.]) or, conversely, may not be sufficiently protective in other areas.

The variable width approach, if defined using a scientifically based process performed objectively, provides the most vulnerable and sensitive water resources with the greatest degree of protection. It also allows greater flexibility in terms of buffer widths for different site conditions and land management practices.

Some communities have chosen to address this issue by using a blend of fixed and variable width buffers (for example, a 25-foot fixed buffer from top of bank on each side of stream, with additional buffer area set aside as necessary depending on several factors, including slope, soils, etc.).

**9. The Draft Land Use Plan proposes “half credit” for undisturbed open space on private property. This discourages the creation of undisturbed open space on private lots and does not have a technical basis.**

Providing only half credit for undisturbed forest on private property creates a disincentive for property owners to set aside protected open space (WRT, 2011). The half credit can create problems with meeting the proposed open space requirements, as demonstrated by the following example 1-acre lot, which meets the established loading rates when evaluated using SET:

- 4,800 sq. ft. of Roof Area (11 percent of 1 ac lot)
- 1,700 sq. ft. of Residential Pavement (4 percent of 1 ac lot)
- 5,000 sq. ft. of Lawn (11 percent of 1 ac lot)
- 32,060 sq. ft. of Protected Forest (74 percent of 1 ac lot)

Only half of the protected forest in this example counts toward the required 42% of undisturbed space as stated in the Land Use Plan. As a result, only 37% of this lot falls under the undisturbed land use category; therefore, the lot does not meet the undisturbed open space requirement despite the fact that it complies with SET.

**10. There is a contradiction between the 1,500-acre CAW set-aside (to offset impacts from selected properties) and an “Overarching Goal” of the Watershed Management Plan, regarding fairness to all parties. Failure to regulate all property owners in the same manner is not consistent with the goal to equitably share the burden of protecting the lake, and creates the potential for small, unregulated properties to compromise the quality of the lake, even with compensatory land set aside.**

The Draft Land Use Plan states that CAW should acquire 1,500 acres of land for conservation purposes, both to buffer the lake and to offset the potential impact of permitted landowner exemptions. This is based on guidance from the Watershed Management Plan. However, this

approach, which benefits some property owners in the watershed but does not benefit others, contradicts one of the “overarching goals” of the Watershed Management Plan regarding sharing the burden of costs and benefits (Tetra Tech, 2007). Small, unregulated properties have the potential to adversely impact water quality in the lake.

## REFERENCES CITED

Pulaski County, 2010a. Stormwater Management and Drainage Manual for the Lake Maumelle Drainage Basin, Pulaski County, Arkansas. Pulaski County Planning and Development. June 2010.

Pulaski County, 2010b. Emergency Ordinance to Adopt the Stormwater Management and Drainage Manual Pursuant to Section 8.6B. of the Subdivision and Development Code of Pulaski County, Arkansas. June 28, 2010.

Tetra Tech, 2006. Baseline Modeling Analysis. Prepared by Tetra Tech, Inc. May 2006.

Tetra Tech, 2007. Lake Maumelle Water Quality Management Plan: Baseline Modeling Analysis. Prepared for Central Arkansas Water by Tetra Tech. May 2007.

USGS, 2011a. Effects of Simulated Land-Use Changes on Water Quality of Lake Maumelle, Arkansas. Prepared by the USGS in cooperation with Central Arkansas Water. USGS Scientific Investigations Report 201-5239.

USGS, 2011b. Response to Tetra Tech review of “Effects of Simulated Land-Use Changes on Water Quality of Lake Maumelle, Arkansas” (Hart and others, 2010). April 12, 2011.

USGS, 2011c. USGS letter from David Freiwald [USGS] to Graham Rich, dated 4/12/2011 (Paragraph 3 of cover letter with response to comments from Tetra Tech regarding the USGS model).

WRT, 2011. Pulaski County Comprehensive Land Use Plan and Land Use Controls for the Lake Maumelle Watershed. Prepared by Wallace, Roberts, Todd, LLC for Pulaski County..



31 May 2011

Mr. Charles R. Nestruc  
Chisenhall, Nestrud & Julian, P.A.  
400 West Capitol, Ste. 2840  
Little Rock, AR 72201

**RE: DSW Comments to April 5, 2011 DRAFT  
Lake Maumelle Watershed Land Use Plan and Regulation,  
Pulaski County, Arkansas**

Dear Chuck,

In addition to those prepared by yourself and Wright Water Engineers, we have prepared our updated comments to the April 5<sup>th</sup> draft of the Lake Maumelle Land Use Plan and Regulation. DSW comments include:

**1. Performance Approach to Land Use Regulation**

The provision of performance measures to comply with the Land Use Regulation is greatly diminished in this draft of the Land Use Plan. Prescriptive minimum standards for development densities, open space, and ridgeline protection are examples of provisions that unnecessarily reduce development flexibility. Higher gross densities can be achieved while meeting current SET standards provided in the Subdivision Ordinance.

**2. Prescriptive Open Space Requirement**

The LIRPD zone requires compliance with fixed density and open space requirements that are excessive, in addition to compliance with the SET provisions in the Subdivision Ordinance.

- Establishing a baseline minimum Open Space requirement is not related to Water Quality. The fixed minimum open space requirement removes the incentive-based approach to encouraging preservation of open space and forested lands (rural character).
- Allowing only half of undisturbed lot area encourages site disturbance by removing incentive to minimize disturbance.
- Full credit for undisturbed lot area should be allowed.

**3. Local-serving Commercial Uses (Neighborhood Commercial)**

The regulation of local-serving Commercial uses (serving the watershed population) within the LIRPD District is overly restrictive. The ratio of commercial development to

dwelling unit (population) requirements should be revised to increase allowable commercial development and permitted uses should be expanded.

**a. Minimum Population Requirements**

The proposed requirements for local-serving commercial based on development thresholds defined by dwelling units far exceed the minimum trade area population requirements cited by the Urban Land Institute (ULI) and do not take into account the existing population of the Lake Maumelle area (6,439\*)  
*\*2005 population projected to 2010*

For example, the Land Use Plan proposes a small grocery-anchored Neighborhood Center (100-120ksf) would require 4,000 -4,800 dwelling units (du) before being permitted. Applying the estimated 2.39 persons per household in Pulaski County, that results in a population requirement of 9,600 – 11,520 residents. This is over three times (3x) the minimum population cited by ULI for Neighborhood Commercial primary trade area (below).

**Commercial Development Trade Areas**

ULI describes the trade area for retail shopping centers as:

**a. Primary Trade Area ( generates 70-80% of regular customers)**

Type	Population Req'd	Radius	Drive time
Neighborhood	3,000 – 40,000	1 ½ Miles	5-10 Minutes
Community	40,000 – 150,000	3-5 miles	10-20 Minutes
Regional	150,000 or more	8 miles	20 minutes

**b. Secondary (15-20% of customers) and Tertiary Trade Areas (can extend 15 miles beyond Primary Trade Area) are not considered in the currently proposed Land Use Regulation calculation.**

**b. LIRPD Non-Residential Permitted Uses**

Permitted uses listed in the Draft Land Use Plan text are appropriately described in general terms to promote readability. Uses described are unnecessarily limited to those described by ULI as Convenience Commercial, and do not include typical Neighborhood Commercial uses. In the Land Use Regulation, LIRPD Non- residential permitted uses should be expanded to include the following Neighborhood-serving Commercial uses:

**LIRPD Non- Residential Permitted Uses (Continued)**

Currently provided in Land Use Plan text	Additional Uses to be included in the Regulation
▪ Convenience Stores	<i>Convenience Center Tenants (ULI)</i>
▪ Small food and beverage stores	Minimart,
▪ Restaurants	Restaurant,
▪ Offices, and	Beauty parlor,
▪ Similar uses supported primarily by residents within the Planned residential development consistent with the allowed site plan	Fast food service, Medical and dental offices <i>Neighborhood Center Tenants (ULI)</i>
	Supermarkets,
	Drugstores,
	Discount department stores,
	Restaurant,
	Furniture store,
	Hardware store,
	Automotive Store,
	Liquor/Wine store,
	Video store,
	Bank

**c. Study Site Application:**

Population of Study Site Planning Area C (PA-C)

421 DU x 2.43 persons/ house hold (DU) = 1,023 Population

- Neighborhood Market Area (ULI) = 3,000 to 40,000 Population. To achieve the minimum, development equaling three (3) times the population of PA-C is needed to support a Neighborhood Center Three time the total area of PA-C (449.4 Acres) is 1,348.2 Acres of total development area, which is achievable within the 1 ½ mile primary trade area radius.
- Commercial Trade Area - Study Site Planning Area C (PA-C) Map (attached)  
The draft Trade Area Map illustrates the 1 ½ Mile Market Area radius for a Neighborhood Center and 3-5 Mile radius for a Community Center.

**4. Non-Residential District**

A requirement for future "rezoning" for Non-Residential District uses is unacceptable. By subjecting Non Residential District uses to a future rezoning decision, the proposed Land Use Plan provides no standing for Non-Residential uses through the proposed Land Use Plan and Regulations. Land Use evaluation criteria must be added at this time to establish Use by Right standing.

The Draft Land Use Plan states that the Non-Residential Zone will be established, "***subject to meeting criteria of use and compatibility***".

While Compatibility Criteria are identified for Site Plan Review, no Land Use Criteria are included. In keeping with the stated Land Use Plan principles of *simplicity and ease of*

*administration*, the following are offered as land use criteria to establish Use by Right standing.

a. Prohibited Uses: as defined in Section 3.3 of the Draft Land Use Plan, as amended in 5 (below).

b. Permitted Uses

Currently provided in Land Use Plan text	Uses to be included in the Land Use Regulation
▪ Any Non-residential Use which is not included in the list of Prohibited Uses.	<i>Community Center Tenants (ULI)</i>
	▪ Junior Department Store (35,000-50,000 sf)
	▪ Discount Department Store (100,000-130,000 sf)
	▪ Supermarket (55-75,000 sf)
	▪ Off-price superstores (25,000-45,000 sf)
	▪ Variety store (35,000-50,000 sf)
	▪ Family wear store (25,000-45,000 sf)
	▪ Furniture store (35,000-40,000 sf)
	▪ Sporting goods store (50,000-60,000 sf)
	▪ Drugstore (8,600-15,000 sf)
	▪ Office supply store (20,000-45,000 sf)
	▪ Cinema (75,000-100,000 sf)
	<i>Other Non-residential uses</i>
	▪ Light industrial/ Manufacturing*
	*no external storage allowed

c. Non-Residential Development Cap

A cap of 600,000 square feet of Non-residential development could be proposed as a reasonable safeguard to preserve the rural residential community character of the Lake Maumelle Watershed. **This equates to approximately 2.0 sq. ft. per dwelling unit projected in the Watershed.**

Projecting potential population based on the allowable development proposed in the Land Use Plan, and using the current house hold (hh) population of the Lake Maumelle area, it is possible to approximate the Community Trade Area population for the Watershed.

**Village: 3,500 Ac. x 2 DU/Ac. = 7,000 DU x 2.39 people/hh = 16,730 population**  
**LIRPD: 23,700 Ac. x 1 DU/Ac. = 23,700 DU x 2.39 people/hh = 56,640 population**  
**Estimated potential population allowed by Land Use Plan = 73,370 population**

The minimum Community Center trade area population of 40,000 within a 3-5 Mile Radius, or 10-20 minute drive is clearly achievable within the anticipated development horizon of properties in the greater Lake Maumelle Watershed.

**5. Prohibited uses:**

- Mineral Extraction should be removed from the list.
- Soil Mining needs further definition to establish conditions involving site grading with earthwork export material.

**6. Stream Buffer setbacks:**

The science of stream buffers is best addressed as a site specific issue. The stream buffer ordinance developed by Wright Water Engineers for the Town of Silverthorne, Colorado offers a good example of buffers that are progressively restrictive, based on site specific conditions. The forested mountain terrain conditions and water quality concerns for tributaries to the Blue River (Gold Medal Trout Stream) are applicable to Lake Maumelle.

**7. Building Height Restrictions**

Building height restrictions promote impervious (roof) cover, extensive site disturbance and deforestation by:

- encouraging distribution of home square footage horizontally, rather than vertically
- encouraging deforestation and site grading to create flat building sites;
- discouraging terrain adapted architecture in building forms (walk-up and walk-out building forms)

**8. Building Height Measurement**

The prescribed method for measuring building height is inappropriate for mountainous terrain. As prescribed, height is measured from the lowest adjacent ground elevation, promoting impervious (roof) cover, extensive site disturbance and deforestation, as noted above. DSW recommends guidelines that allow building height measured from adjacent ground elevation at any point of the building perimeter, to encourage terrain responsive, stepped building forms and to reduce impervious area.

**9. Ridgeline development restrictions**

Ridgeline development regulations are unrelated to water quality and in fact are detrimental to water quality protection, are too restrictive, and should be reconsidered or eliminated.

a. Water Quality protection principles discourage site disturbance. Many intermediate ridge tops in the watershed represent the best development sites to minimize site disturbance. By prohibiting development on those flatter ridge top areas, ridgeline restrictions promote deforestation, earthwork and home construction on the steeper, erosion-prone side-slopes that are the most visibly sensitive.

b. The cumulative numerical restriction of prohibiting building sites within 56' elevation of the ridgeline is excessively restrictive. Requirements of rooflines 20' below the ridgeline elevation plus the building height restriction of 36', result in a 56' ( $20'+36'=56'$ ) total elevation restriction below the ridgeline elevation.

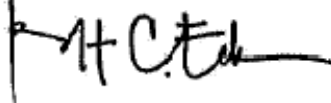
c. Additional comments may be necessary if, and when more precise definitions of "viewshed protection" and "ridgeline protection" are developed. Depending upon the definition of "ridgeline" the proposed ridgeline could eliminate 40% or more of property from development. For example, Deltic has applied many of the proposed land use restrictions to a hypothetical 1,675 acre development. The site selected for the hypothetical development has primary, secondary, and tertiary ridgelines. DSW has re-calculated ridgeline and building height restriction impacts, to the Study Site (1,675.50 Acres) with the following results:

- Primary Ridgeline (Watershed Boundary) restriction impact: .....None within Study Site  
*Deltic property to the east is impacted by Primary Ridgeline restrictions*
- Secondary Ridgeline restriction impact: .....100.41 Acres (7.7%)
- Tertiary Ridgeline restriction impact: .....554.23 Acres (34.0%)
- TOTAL (Primary, Secondary, Tertiary) Study Site Impacts:.....655.23 Acres (40.0%)

Please contact me at your convenience to further discuss any of the above items.

Very truly yours,

**DESIGN STUDIOS WEST, INC.**



Robert C. Eck, ASLA  
Vice President



**From:** Clark, Richard B  
**Sent:** Thursday, June 02, 2011 3:51 PM  
**To:** Van McClendon  
**Subject:** Lake Maumelle - Central Arkansas' Water Supply

To : Director Van McClendon

Because I was out of town the last week of May ( thus missing the May 31 deadline ) , your office gave me permission to send this e-mail to be included with the comments on the Lake Maumelle Watershed Plan .

# 1 Concern : Keep building in the watershed as low density as possible !

# 2 Keep amounts of chicken litter , manure , waste water sludge applied to land in the watershed limited to amounts appropriate to the individual landowner !

# 3 Prohibit gas and shale mining and drilling .

# 4 Prohibit long distance electrical , gas , oil , and transmission lines out of the watershed. Construction and maintainance of lines would significantly increase pollution .

# 5 Prohibit building on ridge lines to maintain views , and to preserve the rural ambiance . This will help keep property values up . Also limit building heights .

# 6 Hold a property owners meeting annually , and include a speaker , a water professional , to remind them of their important role as the guardians of Lake Maumelle and the drinking water for all of us .

Nancy Clark  
27 Sherrill Road  
Little Rock , AR  
72202