

Dry Subdivisions: Should Fire Flow Be Required in Rural Communities?

Kristi N. Gagnon

Copper Canyon Fire and Medical Authority, Camp Verde, Arizona

CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed: Krist. Gagnon

### Abstract

As development revived within Camp Verde, Arizona, Copper Canyon Fire and Medical Authority (CCFMA) was faced with contention over the requirement for new subdivisions to provide fire flow. The problem was CCFMA did not know if they were correctly interpreting and enforcing the 2012 International Fire Code (IFC) requirement for water supply for fire flow. The purpose of this research was to determine what the legal and appropriate interpretation and enforcement of the 2012 IFC requirement for water supply for fire flow are, as it applies to new residential subdivision development in rural areas.

This applied research project utilized an evaluative research method to answer the following questions: (a) What Arizona State laws impact the requirement for water supply for fire flow? b) How are other fire agencies within Arizona interpreting and enforcing the requirement for water supply for fire flow for new residential development? (c) How did CCFMA previously interpret and enforce the requirement for water supply for fire flow for new residential subdivision development?

The researcher performed a literature review to identify previously published materials that address the topic of water supply for fire flow. Additionally, the researcher interviewed the Acting Arizona State Fire Marshal and the Deputy State Fire Marshal. Through the interviews, applicable state statutes were identified and it was ascertained that Copper Canyon Fire's application of the fire code is within state law. Also, a survey was conducted with members of the Arizona Fire Marshals' Association. Survey participants revealed that fire code officials are fairly consistent with the requirement for water supply; all require water supply provisions within new subdivisions; as prescribed by Appendix B in the IFC, NFPA 1142, or fire sprinkler systems. Lastly, a review was conducted of existing subdivision documents. The identified

documents revealed the water supply requirement for new subdivisions was enforced by Copper Canyon Fire as early as 1994, and some form of water supply was required in all subdivisions that were reviewed by the fire district.

Through the research, it was determined that Copper Canyon Fire's current interpretation and application of the IFC's requirement for water supply for fire flow is legal and appropriate. However, it is recommended that Copper Canyon Fire create a written policy delineating when water supply is required and under what conditions would alternative water supplies be acceptable. It was also recommended that dialogue occurs between fire code officials and elected officials and developers to assist with education and understanding of requirements.

## Table of Contents

Certification.....	2
Abstract.....	3
Table of Contents.....	5
Introduction.....	6
Background and Significance.....	7
Literature Review.....	11
Figure 1: NFPA 1142 Formulas for Determining Water Supply.....	19
Procedures.....	21
Results.....	24
Figure 2: Water Supply Options Given by Survey Participants When No Water Mains Are Available.....	28
Figure 3: Subdivisions Approved in Camp Verde and the Requirement for Water Supply.....	30
Discussion.....	31
Recommendations.....	36
Reference List.....	39
Appendices	
Appendix A: Email to Arizona Fire Marshals' Association Requesting Participants for Survey and Survey .....	41
Appendix B: Interview with Arizona State Fire Marshal's Office .....	45
Appendix C: Survey Responses .....	50
Appendix D: Millwood Estates Covenants, Conditions & Restrictions .....	78
Appendix E: The Preserve Covenants, Conditions & Restrictions .....	85

### Dry Subdivisions: Should Fire Flow Be Required in Rural Communities?

Is it realistic to have one set of rules and requirements for all communities; whether big or small, rich or poor, new or old? Is it fair to force people, businesses, and developers to fork out the same amount of money for “protection,” with no regard for how deep or shallow their pockets are? Most fire code officials would unequivocally reply with a resounding, “Yes!” While most businesses and developers would resolutely reply, “No!” It was this debate that caused Copper Canyon Fire and Medical personnel to seek out educated answers to this problem.

In March of 2016, local developers in Camp Verde, Arizona sought to get approval to build a small subdivision. In their application, they included a request for an exemption to the fire code’s water supply requirement. While Copper Canyon Fire’s “not approved” response was resolute, the phones of the Camp Verde Town Council members began to ring, and very quickly, the matter became a political hot topic. The Council members then questioned the necessity of the requirement, and the authority of the International Fire Code (IFC).

Currently, Copper Canyon Fire interprets that the IFC’s requirement for water supply for fire flow applies to new subdivisions coming through the plat application process. At the initial proposal of the subdivision project, Copper Canyon Fire requires fire hydrants supplied by water mains to be installed. When water mains are not accessible, an on-site water storage with a minimum amount of water as prescribed by the IFC or the National Fire Protection Association (NFPA) Standard 1142 is prescribed. Or an automatic fire sprinkler system may be installed within each building within the subdivision.

The problem is Copper Canyon Fire and Medical Authority does not know if they are correctly interpreting and enforcing the 2012 International Fire Code requirement for water supply for fire flow, as it applies to new residential subdivision development. The purpose of

this research is to determine what is the legal and appropriate interpretation and enforcement of the 2012 International Fire Code requirement for water supply for fire flow, as it applies to new residential subdivision development in rural areas.

This applied research project utilized an evaluative research method to answer the following questions: (a) What Arizona State laws impact the requirement for water supply for fire flow for new residential subdivision development? (b) How are other fire agencies within the State of Arizona interpreting and enforcing the 2012 International Fire Code requirement for water supply for fire flow for new residential subdivision development? (c) How did Copper Canyon Fire and Medical Authority (formerly Camp Verde Fire District) previously interpret and enforce the requirement for water supply for fire flow for new residential subdivision development?

The results of this research, and whatever decision is made regarding the water supply exemption request will have significant impacts on all future development within the Town of Camp Verde. It will set a precedence for enforcement of the fire code, as well as other codes and standards.

### Background and Significance

The Town of Camp Verde, is located in the geographic center of the State of Arizona. While the beautiful town was developed along the always flowing Verde River, and is split by Interstate 17, which is the major interstate that runs north and south through the State, Camp Verde has managed to stay quaint. The recorded population of Camp Verde is just under 11,000 people. People living in Camp Verde relish their frugal, small town lifestyle, living on the average household income of less than 36,000 dollars per year (USA.com, n.d.).

In the early years of the twenty-first century, when the economy was flying high, Camp Verde had the opportunity for commercial growth, but local elected officials reeled at the thought of Camp Verde becoming a big city. They said, “No, thank you” to businesses such as Wal-Mart and Home Depot wanting to erect big box stores within the Town limits. No one faulted them for wanting to maintain the same quality of rural life that they had enjoyed for a hundred years. However, now looking back, more than ten years later, those big box stores would have provided greatly needed financial support for this small town as it weathered the great recession. Moreover now, in 2016, when the economy is gaining traction, Camp Verde is still lagging behind. Mainly, Camp Verde struggles to attract commercial growth because of the limited infrastructure. When the economy was booming, commercial development enabled cities and towns to expand their utilities; such as water, sewer, and natural gas. Camp Verde, unfortunately, missed that boat. Therefore, now, despite the ample flat land with easy highway access, commercial businesses tell Camp Verde, “No, thank you” because it would cost too much to extend underground utilities from the center of Town out to where the developable land is. This has left current local officials, who see the need for reasonable growth, eager for any development, and some willing to bend the rules when able to do so.

This mindset is not limited to our local elected officials. In 2008 the members of the International Code Council voted to insert a requirement into the International Residential Code, mandating that all new one- and two-family residences have a fire sprinkler system installed. In response to this new requirement, in 2011, the State of Arizona passed House Bill 2153 that forbade any municipality from requiring fire sprinklers in one- and two-family residences, unless that municipality had already adopted an ordinance before December 31, 2009, requiring sprinklers in residential homes (Jensen, 2011). This legislation tightly tied the hands of fire



officials and building officials; most have been advised by legal counsel not even to suggest fire sprinklers, under any circumstances, for fear of litigation.

Most recently, on September 14, 2016, Senator Sylvia Allen wrote a letter to Camp Verde's Town Manager, Russ Martin. In this letter, Ms. Allen writes,

We have a suppressed building/construction economy in this state, and over-regulation can seriously hinder economic growth, particularly in rural Arizona. It is my hope that the Fire Districts can operate within the intended framework of the state statutes pertaining to fire sprinklers to provide for the public safety while weighing the economic costs of compliance. (Allen, 2016)

It is a goal of the Executive Analysis of Community Risk Reduction course to improve the executive's ability to focus on reducing risks to the local community (United States Fire Administration, 2016). Researching how to interpret the fire code properly, and how to effectively enforce it in areas where it is difficult to do so, significantly improves one's ability to reduce risks in a focused and educated manner. When the Fire Code is justified through research, it is more easily supported and adhered.

This research effectively accomplishes two of the U.S. Fire Administrations 2014 – 2018 goals. First, this research reduces fire and life safety risk through preparedness, prevention, and mitigation. Additionally, this research enhances the fire and emergency services' capability for response to and recovery from all hazards (United States Fire Administration, 2016). By properly enforcing the Fire Code and ensuring that adequate safety measures are in place, it reduces risks, and it better increases the fire services' ability to respond and mitigate the emergency.

Copper Canyon Fire and Medical Authority has one fire station in Camp Verde. At the Camp Verde station, one fire engine and two ambulances are constantly staffed to respond to emergencies. This station runs approximately 2,500 calls per year, with approximately 83% of those calls being medical. It is common for both ambulances to be in route to or from the hospital, located 20 minutes away, at the same time. The Camp Verde fire station also responds to approximately 100 fires per year. With this call volume, it is with regularity that the Camp Verde fire station does not have staffing for a water tender, should one be needed for a fire call, until off-duty personnel are called in for additional staffing or a neighboring agency responds. This limitation increases the importance of having an on-site water supply ready to be utilized immediately upon arrival of the fire engine.

It is imperative that the enforcement of the fire code be justified with research and education. In response to the requirement for water supply, a well-known local realtor wrote a letter to the editor of the local newspaper. On September 21, 2016, the following was printed,

Is it fair that 22 percent of the money we pay in property taxes goes to the fire district? Why do district taxes increase every year? Should we bring it up? That is the heart of the four-hour debate held at the Camp Verde town council work session last Wednesday night....

We live in rural Camp Verde. We could live in urban Phoenix or Tucson. We could walk on asphalt and concrete where the lights never dim, the streets never sleep and its 98 degrees at 5 a.m. in the summer. There are lots of homes there that meet the fire flow requirement being mandated by the Camp Verde Fire District. But we like it here. We love the space between homes, the green grass, the trees, the running water, creeks,

river, canals, flood irrigated lawns, the incredible stars, the mountain views the fresh air, we feel alive.

Does the fire district's position towards dry subdivisions threaten this life style? Is it important to discuss? At the work session the issue was not always clear, but my issue is our rural life style....

To afford fire flows you need density like the Verde Cliffs, not like Jordin Meadows, Rio Verde Ranchos, Diamond Creek, or River Ranch Estates.

Odds are no matter where you live in Camp Verde the standards of the 2012 fire codes are not met. Do we want to become urban? If we adopt the entire fire code no home would be built anywhere without fire flow. Is this what we want? (Witt, 2016)

To local elected officials, and constituents, this issue is being turned into an emotional one. People are being misinformed and led to believe that their way of life, their culture, and their values are being threatened. The only way to combat this is with factual, logical and transparent information regarding the issue at hand; which is protection from the very real threat of fire.

### Literature Review

“Building owners and occupants see fire as something which will never happen to them, as a risk they will tolerate because fire prevention measures can be costly, or as a risk adequately balanced by the provisions of a fire insurance policy” (National Commission on Fire Prevention and Control, 1973). This statement was written over 40 years ago; unfortunately, not much has changed.

Today, it is said that new fire codes make it unfeasible to build and develop. It seems that every time a fire agency is seeking to adopt a new fire code edition, the adoption is met with

resistance from developers arguing that the new regulations will halt economic growth.

However, fire codes have been around for thousands of years, and it is reasonable to expect the codes to change as buildings change in response to the current style and technology.

It is speculated that the first full-time fire department, in the western culture, was in Rome, about 2000 years ago. These “Corps of Vigiles,” as they were called, “were selected to roam the city and not only sound the alarm and put out the fires, but also to enforce fire codes (sometimes with corporal punishment)” (Calfee, 2011). While the International Fire Code used today is undoubtedly extremely different from the code that was enforced 2000 years ago, the premise behind the code is the same. A fire problem was identified and the intelligent minds of the day determined that certain measures could be taken to reduce the problem. Furthermore, it would be reasonable to assume that water to put out the fire played a major role in the “Corps of Vigiles” ability to mitigate a fire situation, and was part of the consideration of code enforcement.

Here in the United States, in 1648, Peter Stuyvesant, the Governor of the New Amsterdam colony, appointed four “fire Wardens” to patrol the colony and inspect homes for wooden chimneys and thatched roofs to help prevent fires. Fires at that time were fought using leather water buckets. At sunset, New Amsterdam citizens were required to fill three buckets of water and place them at their doorsteps in case a fire alarm was sounded. When a fire was discovered, a line of people formed a bucket brigade, passing filled buckets from the water supply to the fire, and a second line passed empty buckets back to be filled. Then, in 1683 the colony of New Amsterdam was taken over by the British and renamed New York. Once again, “fire Wardens” were appointed to inspect chimneys and hearths, as well as to ensure that each home had their required leather bucket to be used for the suppression of a fire. A person could

be fined up to 20 shillings if the Fire Wardens found him or her in violation of the city's fire prevention ordinances (The Colonial Period, 2016). Therefore, while some developers might protest the requirement for water supply in residential subdivisions, it is documented that even as early as the mid-1600s residents were required to provide some level of water supply for fire protection. Today, it is the responsibility of fire code officials to ensure that fire prevention codes are being met, including the provision of water supply for fire suppression.

The basic method for controlling building fires by fire departments is through the use of water, which is typically applied with manual hose lines or water monitors. This water can come from a municipal water supply, a private water supply, or from the fire department itself (i.e., water tenders). In order to effectively fight a fire, the water supply available must be adequate for the threat from the building and contents. (Benfer & Scheffey, 2014, p. 6)

In Benfer and Scheffey's 2014 study, the different methods currently used to calculate required water flow rates are identified and then evaluated for effectiveness compared to actual flow rates. Four methods were identified within the United States for building planning; the ISO Method, the IFC/NFPA1 Method, the NFPA 1142 Method, and the IWUIC Method. The data identified that the flow rate prescribed in each of the four methods was rarely less than the actual flow used. However, in four out of the 25 fire events within the study, the total water supply required by NFPA 1142 (in gallons) was less than the actual water used to suppress the fire (in gallons). The IFC/NFPA 1 Method, on the other hand, consistently prescribed a much higher water supply amount than what was actually used (Benfer & Scheffey, 2014). So, one can infer that the water supply calculation in NFPA 1142 will be adequate in most fire occurrences, while

the amount of water provided by the IFC/NFPA 1 calculation will always provide sufficient water to suppress a fire, plus an excess amount of water.

The authors go on to say,

It appears that incorporating a sprinkler reduction factor in fire flow calculations is warranted. The fire flow used by the fire department for incidents where sprinklers operate is likely to be significantly less than if sprinklers were not present. This suggests that the methods which incorporate a sprinkler reduction factor may be more useful in establishing appropriate fire flow requirements. (Benfer & Scheffey, 2014, p. 37)

All four of the water supply calculation methods utilized in the United States allow for a reduction in fire flow when an automatic fire sprinkler system is installed.

With four water supply calculation methods available, which one should be used by Copper Canyon Fire and Medical Authority? To answer that, one must initially look at State law, which supersedes local codes and ordinances. In Arizona Revised Statute § 37-1383 (2007), the state fire marshal is mandated to “adopt by rule a state fire code establishing minimum standards for (a) safeguarding life and property from fire and fire hazards and (b) the prevention of fires and alleviation of fire hazards” (Powers and duties; arson investigators, 2007). The state fire marshal shall also,

enforce compliance with the fire code adopted pursuant to this subsection throughout this state except in any city having a population of one hundred thousand persons or more that has in effect a nationally recognized fire code, whether modified or unmodified, and that has enacted an ordinance to assume such jurisdiction from the state fire marshal. (Powers and duties; arson investigators, 2007)

In compliance with this statute, in November of 2015, State legislators voted to adopt the 2012 International Fire Code. It states in Arizona Administrative Code, Title 4, Chapter 36, Article 2,

Unless otherwise provided by law, any person residing, doing business, or who is physically present within the state of Arizona shall comply with the provisions of the International Fire Code (2012 Edition), including D102.1 and D107.1 of Appendix D and all provisions of Appendices B, C, E, F, G, H, I, and J, which is published by the International Code Council, incorporated by reference as the State Fire Code, and modified by Article 3. The incorporated material does not include any later amendments or editions. (Department of Fire, Building and Life Safety, 2011)

In Compliance with Arizona State law, Copper Canyon Fire and Medical Authority (formerly Camp Verde Fire District) adopted the same code as the State Fire Marshal's Office. In anticipation of the State adopting to the 2012 International Fire Code, in August of 2014, the Camp Verde Fire District fire board voted to approve the adoption of the 2012 International Fire Code, including Appendices A through I.

To develop a solid understanding of the currently adopted fire code's requirement for water supply, the researcher conducted a review of several sources that address the topic. First, the actual fire code verbiage was reviewed, as well as the commentary. The 2012 International Fire Code states, in section 507 that, "An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction" (International Code Council, 2011). While this code requirement seems fairly cut and dry, it leaves one asking the questions, what is an approved water supply and what is the

required fire flow? To answer that we can look at the official commentary for the requirement.

The commentary states,

Note that this section states that the water supply must be capable of supplying the required fire flow to the premises; however, the means by which the fire flow is supplied is determined by the policies of the jurisdiction, such as a pumper taking suction from a hydrant, tanker or lake (also see Appendices B and C, for further information on fire flows and fire hydrants).... A question that often arises is whether it is the intent of the code's regulations pertaining to fire protection water supply to be applicable to one- and two-family residential development sites upon which buildings are constructed under the provision of the IRC.... The IRC applies only to the construction of the structures of those buildings and not to the development of the site upon which such structures are built. Accordingly, where the code is adopted, its fire protection water supply provisions would apply because they are dealing only with land development requirements providing fire protection water supply to such residential sites on the same basis as to the rest of the community. (International Code Council, 2011)

Again, the IFC is clear that the requirement for water supply applies to one- and two-family dwellings; yet, we still do not have a clear answer for what could be considered an approved water supply and what the required fire flow is.

In the IFC's commentary, written above, it references Appendices B and C. The opening statement of the Appendix B commentary of the 2012 IFC is,

The availability of water is essential for fire-fighting operations. The amount of water required to fight a fire depends on many things, including the type of construction, the location of the fire, the contents of the building, response time and the capabilities of the



fire department. Fires will increase in size very quickly from the time of ignition to the arrival of the fire department. Couple these unknowns with the fact that the actual water available varies significantly from one jurisdiction to another, in many cases within the same jurisdiction, and it is easy to see that determining the necessary water supply is not an exact science. (International Code Council, 2011)

While determining the necessary water supply is not an exact science, Appendix B provides written clarification and a table to assist fire code officials in determining required fire flow. The Appendix B table is based on the water supply formula used by the Insurance Services Office. This table bases the amount and flow of water required on construction type and building area. For one- and two-family dwellings, the Appendix states,

The minimum fire-flow and flow duration requirements for one- and two-family dwellings having a fire-flow calculation area that does not exceed 3,600 square feet shall be 1,000 gallons per minute for 1 hour. Fire-flow and flow duration for dwellings having fire-flow calculation area in excess of 3,600 square feet shall not be less than that specified in Table B105.1. (International Code Council, 2011)

This code section and table are easily utilized in areas where water mains are available. However, in rural areas where most buildings are serviced by a well, it is nearly impossible to meet even the lowest amount called for (1,000 gpm). This is the case within most areas of Camp Verde. Water mains exist within the downtown area and a few other neighborhoods; however, a river divides our town in half, and the water mains do not extend past the river. Fortunately, there is a section in this Appendix that addresses that.

Section B103.3, titled, *Areas without water supply systems*, states, “For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate

and reliable water supply systems do not exist, the fire code official is authorized to utilize NFPA 1142” (International Code Council, 2011).

NFPA 1142 is the Standard on *Water Supplies for Suburban and Rural Fire Fighting*. Even within the title, one can deduce that this standard would be applicable to our community, and could be utilized in areas without access to water systems. To confirm this, one only need to read the Administration section of the standard.

This standard identifies a method of determining the minimum requirements for alternative water supplies for structural fire-fighting purposes in areas where the authority having jurisdiction (AHJ) determines that adequate and reliable water supply systems for fire-fighting purposes do not exist otherwise.... The purpose of this standard is to assist the AHJ to establish the minimum water supply necessary for structural fire-fighting purposes in those areas where it has been determined that there is no water or inadequate water for fire-fighting. (National Fire Protection Association, 2011)

In chapter four of the standard, a formula is given to calculate the minimum required water supply for buildings in the rural environment. This formula is shown in Figure 1.

**Figure 1. NFPA 1142 Formulas For Determining Water Supply**

Structures Without Exposure Hazards:

$$WS_{min} = \frac{VS_{tot}}{OHC} (CC)$$

where:

 $WS_{min}$  = minimum water supply in gal (For results in L, multiply by 3.785.) $S_{tot}$  = total volume of structure in  $ft^3$   
(If volume is measured in  $m^3$ , multiply by 35.3.) $OHC$  = occupancy hazard classification number $CC$  = construction classification number

Structures With Exposure Hazards:

$$WS_{min} = \frac{VS_{tot}}{OHC} (CC) \times 1.5$$

where:

 $WS_{min}$  = minimum water supply in gal (For results in L, multiply by 3.785.) $S_{tot}$  = total volume of structure in  $ft^3$   
(If volume is measured in  $m^3$ , multiply by 35.3.) $OHC$  = occupancy hazard classification number $CC$  = construction classification number

Figure 1. Formulas for determining required minimum water supply amount (in gallons) for alternative water supply methods. Adapted from *NFPA 1142: Standard on Water Supplies for Suburban and Rural Fire Fighting, 2012 Edition*, by The Technical Committee on Forest and Rural Fire Protection, 2011, p. 6. Copyright 2011 by the National Fire Protection Association.

Chapter five of the standard provides the numerical value for each occupancy classification, and chapter six provides the numerical value for each construction classification. With these given values, one can easily calculate the minimum water supply required. For example, a typical wood-frame, 3,000 square foot house, 12 feet in height, would require a minimum water supply of 7,714 gallons  $\left(\frac{(3,000 \times 12)}{7} \times 1.5\right)$ , if no other structure is located within 50 feet of the building.

The standard additionally requires that the water supply source, whether a storage tank, pond, lake, cistern, or other collection of water, be maintained and accessible on a year-round basis and the capacity be based on the 50-year drought. Additionally, all non-pressurized sources need to be accessible using a dry hydrant (National Fire Protection Association, 2011). While this seems fairly reasonable, even this minimal requirement is met with resistance.

It is possible that those resisting the requirement do not understand the fire problem that we still face here in the United States. One developer informed the Town Council that homes built today are much safer and more resistant to fire than in previous decades. While that statement is partially correct with the conventional use of drywall, and better electrical standards, the fact of the matter is that “fires today can develop more aggressively and potentially pose more dangers than just a few decades ago. That’s largely because the contents and construction materials in modern houses can be much more volatile than they used to be” (Roman, 2015).

Recently, UL and NIST collaborated to conduct over 200 structural fire experiments to gain a better understanding of how fire responds to different variables. They concluded that the energy rate for modern furnishings, generally made of synthetic materials, has increased three or four times to that of more traditional furniture that was made of wood and cottons. Additionally, the new lightweight construction materials in residential homes generally fails much faster than traditional solid wood beams. After taking these factors into consideration and then observing the hundreds of fire experiments, UL concluded that “modern homes and their contents can burn eight times faster than homes of decades ago” (Roman, 2015). This concept can be observed in the YouTube video titled, *UL test: Legacy home contents and new content fires*.

Although, we in the fire service, especially community risk reduction, are frequently reminded of the number of fires that occur each year, many citizens are unaware that in 2015, public fire departments responded to 501,500 structure fires; and 365,500, or 73%, of those occurred in a home structure. Sadly, in those 365,500 home fires, 2,560 people lost their lives (Haynes, 2016). While community risk reduction efforts have been, and are, effective in preventing fires, fires are still occurring. Therefore, communities must still be aware of the

potential and provide adequate safety measures to ensure that losses are kept to a minimum should a fire occur.

Not only does the fire service value water supply, but the Insurance Services Office also regards water supply as a critical element to a community's designated level of safety.

Forty percent of your community's Public Protection Classification (PPC™) grading is based on your water supply.... To be eligible for a PPC of Class 8 or better, a community's water supply system must be able to deliver at least 250 gpm for a period of two hours. If the fire department delivers the 250 gpm through tanker shuttle, large-diameter hose, or other alternative water supply, the water must be available within five minutes of the arrival of the first-due apparatus, and the department must maintain the flow, without interruption, for the two-hour duration. (Insurance Services Office, n.d.)

This requisite necessitates that a water supply is accessible within close proximity to the affected structure. If a water tender has to travel a long distance to draft water, the on-scene crew may be left waiting for water.

### Procedures

This applied research project (ARP) utilized an evaluative methodology to answer the following three research questions: (a) What Arizona State laws impact the requirement for water supply for fire flow for new residential subdivision development? (b) How are other fire agencies within the State of Arizona interpreting and enforcing the 2012 International Fire Code requirement for water supply for fire flow for new residential subdivision development? (c) How did Copper Canyon Fire and Medical Authority (formerly Camp Verde Fire District) previously interpret and enforce the requirement for water supply for fire flow for new residential subdivision development? A literature review was conducted to assist in answering the research

questions. The resources mentioned in the literature review guided the research procedures that followed.

To answer the first research question, the researcher reviewed the Arizona Revised Statutes as part of the literature review, as well as interviewed the Deputy State Fire Marshal/Plans Reviewer, Dan Ierley, and the Acting State Fire Marshal, Frederick Durham via email and phone calls. These two participants were chosen because their positions within the State of Arizona government give them a sound understanding of the legal parameters for applying the fire code. The information collected during these interviews included known state laws and policies that govern local fire code enforcement, and consequences of not applying the fire code in the same manner as the State. The information collected would be utilized when analyzing Copper Canyon Fire's current interpretation and enforcement of the water supply requirement. Communication between the researcher and two members of staff from the same agency was beneficial in some aspects, as well as a limitation. This is a limitation in that two people do not always share the same opinion or interpretation; therefore, the information gathered can appear inconsistent. The researcher, in this procedure, addressed this with additional follow-up communication between both personnel.

To answer the second research question, the researcher created a survey to send out to the members of the Arizona Fire Marshals' Association (AFMA). These participants were chosen because the different members of AFMA interpret and enforce the fire code in their diverse communities; allowing for a range of applications from urban to rural environments. Arizona Fire Marshals' Association currently has 274 members. The questions for the survey were derived from the information gathered during the literature review. The questions within the survey solicit information about other agency's policies and application of the requirement for

water supply in regards to subdivisions and other one- and two- family residential development. The survey was created in surveygizmo.com and then the link to the survey was sent to the AFMA secretary. The AFMA secretary then sent the email, with request and link included, out in a blast to all AFMA members (Appendix A).

Consistency is critical to code enforcement; therefore, the data collected from the survey would be utilized in comparison with Copper Canyon Fire's current interpretation and enforcement of the International Fire Code's requirement for water supply. Limitations to this procedure included a majority of AFMA members working in areas where municipal water systems exist, so participants may not be familiar with alternative water supplies. Additionally, with a survey, no follow-up questions can be asked of participants. Therefore, if a participant misreads or misunderstands a question, the data collected would be skewed.

The researcher performed an examination of existing documents to answer the third research question. Documents within Copper Canyon Fire were sought, as well as documents at the Community Development Office of the Town of Camp Verde. The type of documents that were requested were ones that contained comments for preliminary and final subdivision plats. The information gathered from this examination of documents would be utilized to form an understanding of how the water supply requirement was previously enforced by fire code officials within the Town of Camp Verde. Once the author could formulate how Copper Canyon Fire previously applied this code requirement, that information could then be used in comparison with the current application, much in the same way as the survey responses.

The main limitation to the third procedure is that there are limited documents for the researcher to review. No subdivision plats were submitted for approval between the years 2007 and 2015. Before 2007, Copper Canyon Fire (then Camp Verde Fire District) did not have a fire

prevention staff member; the fire chief operated as the fire code official and did not have adequate training in enforcing the fire code. Therefore, it is to be expected that the data collected through researching historical documents would be inconsistent. Furthermore, the fire chiefs that reviewed the earlier subdivision plats are no longer available to interview to discuss the logic behind the requirement or lack of requirement.

### Results

This section reviews the findings of the evaluative research to answer the following three research questions: (a) What Arizona State laws impact the requirement for water supply for fire flow for new residential subdivision development? (b) How are other fire agencies within the State of Arizona interpreting and enforcing the 2012 International Fire Code requirement for water supply for fire flow for new residential subdivision development? (c) How did Copper Canyon Fire and Medical Authority (formerly Camp Verde Fire District) previously interpret and enforce the requirement for water supply for fire flow for new residential subdivision development? These three research questions were designed to provide data to which Copper Canyon Fire and Medical Authority could evaluate their current interpretation and application of the fire code requirement for water supply for fire flow.

The researcher conducted interviews with the Deputy State Fire Marshal/Plans Reviewer, Dan Ierley, and the Acting State Fire Marshal, Frederick Durham to answer the first research question. These interviews were conducted via email and phone. Through these interviews, it was determined that state law requires that the state fire marshal adopts a state fire code; thereby, establishing a minimum standard. Additionally, it was communicated that the state adopted fire code is the governing minimum standard unless a city has a population of one hundred thousand persons or more; which Camp Verde does not. Furthermore, Mr. Durham, Acting State Fire



Marshal, stated that if a community were not to adhere to the requirements of the fire code, then the State Fire Marshal's Office would step in as the authority having jurisdiction and would ensure compliance with adopted regulations (Appendix B).

Mr. Durham and Mr. Ierley explained that the 2012 International Fire Code was approved by the Governor and effective January 1, 2016, throughout the State of Arizona. They clarified that the 2012 International Fire Code, explicitly requires a water supply for fire protection, which they do enforce; however, this rule was not new to the 2012 edition of the code. Mr. Durham stated that he recalls the water supply being required in the 1988 Uniform Fire Code (Appendix B).

Mr. Ierley, in an email correspondence, stated that the State's interpretation and application of the requirement for water supply in regards to new one- and two-family residential development was very similar to Copper Canyon Fire's. The State Fire Marshal's Office does require all new subdivisions to provide a water supply for fire flow in accordance with section 507.1 of the 2012 International Fire Code. The fire flow is determined by Appendix B of the 2012 International Fire Code; however, if a residential subdivision cannot meet the required fire flow of the IFC, then they do utilize the lesser water supply requirement of NFPA 1142. The difference from Copper Canyon Fire's application is that the State Fire Marshal's Office does not allow for no water supply for fire flow when automatic fire sprinkler systems are installed within all homes within the subdivision. The State Fire Marshal's Office only allows for a reduction in the water supply when automatic fire sprinklers are present (Appendix B).

This difference in application led to further discussion to determine if it was legal for Copper Canyon Fire to accept automatic fire sprinkler systems as the sole water supply for fire protection in new subdivisions. Mr. Durham replied that it would be legal to accept automatic

fire sprinklers as the only water supply for new residential subdivisions, in certain cases, as determined by Copper Canyon Fire's fire code official. Though he did clarify that this would need to be put into a written policy, so that the requirement did not appear inconsistent and capricious. Mr. Durham did, however, caution that the Town of Camp Verde personnel and the Copper Canyon Fire personnel should not discuss automatic fire sprinkler system installations with developers in a manner that would be construed as requiring them or even persuading the decision to install them (Appendix B).

The information gathered through the interviews with the Acting State Fire Marshal, and the Deputy State Fire Marshal was very beneficial in providing clarity for what Arizona State laws apply to the enforcement of the fire code, including the requirement for water supply for fire flow in new residential subdivisions. The discussions provided an understanding of the State Fire Marshal's Office interpretation and application of the water supply requirement, which must be followed by Copper Canyon Fire and Medical Authority.

To summarize the answer to the first research question, Arizona Revised Statutes 37-1383 requires the State Fire Marshal to adopt a fire code that is enforceable in the Town of Camp Verde and throughout the State of Arizona. In January of 2016, the Arizona State Fire Marshal's Office began enforcing the 2012 International Fire Code. This code, then became the minimum standard for the State of Arizona. Copper Canyon Fire and Medical Authority is in compliance with this minimum standard because they had adopted the 2012 International Fire Code in 2014. The State Fire Marshal's Office does strictly require new residential subdivisions to provide a water supply for fire flow in accordance with Appendix B of the 2012 IFC. If a subdivision is unable to meet the fire flow prescribed in Appendix B of the 2012 IFC, then they will utilize NFPA 1142 to determine the minimum water supply for fire flow. Additionally, the State Fire

Marshal's Office does not allow for automatic fire sprinklers to replace the water supply for fire flow. They will, however, allow other fire agencies to make that "trade-off" in certain situations, if it is within written policy, and does not conflict with Arizona Revised Statute § 9-807; which prohibits municipalities from requiring fire sprinklers in one- and two-family residences (unless a sprinkler ordinance was in place prior to December 31, 2009).

The second research question addressed the concern that Copper Canyon Fire might be enforcing the fire code in a manner that is inconsistent with other fire agencies throughout the State of Arizona. To answer this question, the researcher conducted a survey with members of the Arizona Fire Marshals' Association (AFMA). An email was sent to the 274 members of AFMA requesting that they complete the survey. Twenty-eight anonymous members participated and completed the survey. Out of the 28 responses, 27 were fire agency personnel, representing 22 different fire agencies. The communities protected by these 22 different fire agencies, ranged in population from approximately 2,000 people to 526,000 people. The one response that was not from a fire agency, was from a private business that provides code plan review and inspection services (Appendix C).

The data received from the survey revealed that 24 out of the 28 participants are enforcing the 2012 International Fire Code. One participant is enforcing the 2015 International Fire Code, and three are enforcing older versions of the International Fire Code. When asked if participants require new subdivisions to meet the requirement for water supply for fire flow, all 28 participants, or 100%, replied, "Yes." When asked if the participant approves new subdivisions that provide no water supply for fire flow, 26 out of 28 participants replied, "No." The two that replied "Yes", clarified in their answer to the question that followed, that they would allow sprinkler systems with storage tanks to be utilized in those situations, and one also

indicated that he has not had to deal with that issue since his predecessor left. Considering all 28 responses, including clarifications, it is deduced that all fire code officials that participated in the survey, require some form of water supply for fire protection for new subdivisions (Appendix C).

The survey also posed the question, “What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?” Twenty-seven participants responded to this question with a variety of answers, including; sprinkler homes, city water mains, above-ground tanks, NFPA 1142, or no other options. The responses to this question are represented in Figure 2.

**Figure 2. Water Supply Options Given by Survey Participants When No Water Mains Are Available**

<b>Water Supply Option Listed by Participants</b>	<b>Number of Participants That Listed the Option</b>
Sprinkler systems installed in all homes	9
Water storage tank	8
No alternatives to water mains	7
NFPA 1142	3
Private water company service	2
Above ground mains connected to water supply	1
International Wildland Urban Interface Code	1
Development Services Division decides	1
Have not had to deal with this issue	1

The responses to the survey questions provide the answer to the second ARP research question. It is evident that other fire code officials throughout the State of Arizona, from small communities to large communities, are requiring new one- and two-family residential subdivisions to provide water supply for fire flow to meet the fire code requirement. The ways

in which developers are able to meet the water supply requirement, again, seems consistent throughout the State; water mains supplying fire hydrants with a flow consistent with Appendix B of the IFC, a water supply sufficient to meet the NFPA 1142 Standard or fire sprinklers within each home. These three means of water supply are approved in both urban and rural communities.

To answer the third research question, the researcher examined existing documents that pertained to subdivisions that were previously reviewed through the plat approval process. The two most recent subdivisions that were reviewed were The Preserve and Millwood Estates, which were approved in 2006. Both of these subdivisions were reviewed by the Camp Verde Fire Chief at that time. Neither of these subdivisions had access to water mains to provide water supply; therefore, the Fire Chief required that each home be provided with an automatic fire sprinkler system. This requirement was recorded within the subdivisions' Covenants, Conditions, and Restrictions (CC&Rs) (Appendices D & E). Unfortunately, neither the Town nor the Fire District can enforce CC&Rs, and since the requirement for fire sprinklers was not recorded on the final plat, some homes were built within these subdivisions without fire sprinkler systems.

Three other subdivisions within the Town of Camp Verde were required to provide fire hydrants supplied by water mains. These three subdivisions, The Cliffs platted in 1994, The Verde Cliffs platted in 2004, and Equestrian Estates platted in 2006, all had accessible water mains. Additionally, there were two subdivisions that were identified that did not have any requirement for water supply for fire flow; Pebble Rock, platted in 2006 and Arena Del Loma Estates, platted in 1995. It appears that these two subdivisions were not routed to the Fire

District for review. Figure 3 shows the identified subdivisions and what was required for water supply for fire flow.

**Figure 3. Subdivisions Approved in Camp Verde and the Requirement for Water Supply**

<b>Subdivision</b>	<b>Year Approved</b>	<b>Water Supply Requirement</b>
The Cliffs	1994	Fire hydrants supplied by water mains
Arena Del Loma Estates	1995	None
Verde Cliffs	2004	Fire hydrants supplied by water mains
Equestrian Estates	2006	Fire hydrants supplied by water mains
Millwood Estates	2006	Automatic fire sprinklers installed in all homes
Pebble Rock	2006	None
The Preserve	2006	Automatic fire sprinklers installed in all homes

From the documents found, it is apparent that as far back as 1994, Copper Canyon Fire and Medical Authority enforced the requirement for water supply for fire flow for new residential subdivisions, albeit apparently somewhat inconsistently. The two methods identified to provide some form of water supply for fire flow were fire hydrants supplied by water mains or automatic fire sprinkler systems. It does not appear that NFPA 1142 was utilized previously by Copper Canyon Fire and Medical Authority.

In summary, the data collected through the research process solidifies that Arizona State law does require that communities, at minimum, abide by the state adopted fire code, which currently is the 2012 edition of the International Fire Code. And although state law prohibits

municipalities from requiring fire sprinklers (unless previously required by ordinance), municipalities and fire agencies can legally accept automatic fire sprinklers as an alternative method for providing water supply for fire flow. Copper Canyon Fire and Medical Authority interprets and applies the fire code requirement for water supply for fire flow consistently with Arizona State law, as well as with other fire code officials throughout the state. All fire code officials that participated in the survey acknowledged the necessity for water supply for fire flow to be provided to new subdivisions and accepted water mains and fire hydrants, water supply in accordance with NFPA 1142, or automatic fire sprinklers as a means of meeting the requirement for water supply for fire flow. Lastly, it was documented that as early as 1994, Copper Canyon Fire and Medical Authority (Camp Verde Fire District at the time) required new subdivisions to provide a water supply for fire flow. Moreover, five out of seven subdivisions that were approved between the years of 1994 and 2006 were required to provide a water supply for fire flow in some manner. And it appears that the two subdivisions that were not required to provide water supply were not reviewed by the fire district.

### Discussion

The results of the research along with the findings of the literature review gave the researcher the ability to evaluate the current situation of Copper Canyon Fire and Medical Authority's enforcement of the fire code requirement for water supply for fire flow for new residential subdivisions. As stated earlier, Copper Canyon Fire and Medical Authority fire prevention personnel deem the 2012 International Fire Code's requirement in Section 507 for water supply for fire flow to be mandatory for new subdivisions seeking plat approval. This was confirmed through the interviews with personnel from the Arizona State Fire Marshal's Office as well as the review of Arizona Revised Statutes. The Arizona Revised Statutes explicitly require

a fire code to be adopted to set a minimum standard for the entire state, and then require the enforcement of compliance with the state adopted code (Powers and duties; arson investigators, 2007). To substantiate this, the Acting Arizona State Fire Marshal, Frederick Durham, wrote in a letter to the researcher,

The current Arizona State Fire Code is the 2012 International Fire Code as amended and adopted. This code satisfies the legal requirement set out in ARS §37-1383. By this statute this code is the minimum standard for the safeguarding of life and property from fire and fire hazards. (Durham, 2016)

Though it was established by state law that the 2012 IFC was the minimum standard that Copper Canyon Fire and Medical Authority could enforce, it was of foremost priority for the researcher to understand how the Arizona State Fire Marshal's Office was interpreting and applying the specific fire code requirement for water supply. Copper Canyon Fire and Medical Authority construed, that while it was mandatory to require a water supply, there was flexibility within the code as to how water supply could be provided. Mr. Durham addressed this within his letter. He elucidates,

Of particular issue is the requirements for fire flow as applied in Appendix B. B101.1 sets "The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix." All buildings have a determined fire flow requirement calculated by the construction type, and floor area of the building. These flow rates are from one thousand gallons per minute for a single-family home less than three thousand six hundred square feet, to eight thousand gallons per minute on a large structure.



Understanding that these flows may not be available in all areas there are two specific modifications within the fire code. Firstly, section B103.1 allows the fire chief to reduce the fire flow requirements for isolated buildings or group of buildings in rural areas or small communities where the development of full fire flow requirements is impractical. This section does allow for a reduction of flow requirements, it has no numeric value attached as to how much it may be reduced. This section does not state that fire flow may be eliminated entirely, just a reduction may be authorized.

The second part of the fire flow modification that this office applies on a regular basis is section B103.3 'Areas without water supply systems.' This specifically applies to rural and suburban areas without water supply systems. Using the calculations as approved by NFPA 1142, sufficient water supply systems utilizing water tanks or other water sources are approved.

Any construction within your fire district may be approved using either of the above methods for determining a reasonable fire flow for the occupancy and type of construction. When utilizing these methods for reduction, other factors may be considered, including but not limited to; fire sprinklers, building construction type, building separation, etc. (Durham, 2016)

Using this letter from the Acting State Fire Marshal as an evaluative tool, it is reasonable to assess that Copper Canyon Fire and Medical Authority is in compliance with state law and the Arizona State Fire Marshal's Office in their interpretation and application of the fire code's requirement for water supply. However, at the end of his letter, Mr. Durham writes, "Ultimately, it is the decision of the Fire District and the community as to the level of protection afforded the residents of your town" (Durham, 2016). This statement could potentially give local elected

officials the impression that they could still have justification to not require water supply for new subdivisions, which is why it was important to collect data as to what other communities are requiring, especially small communities with limited water supply systems.

The results of the survey provided the researcher with an understanding that Copper Canyon Fire's interpretation and application of the requirement for water supply was fairly consistent with fire code officials throughout the state. All fire code officials that participated in the survey stated that they require water supply for new subdivisions, even fire code officials that serve communities with a population as low as 2,000 people. The responses to the survey corroborate the International Fire Code commentary that states the IFC allows for alternative water supplies. Many survey participants pointed to NFPA 1142 as an alternative to the Appendix B fire flow table, but still falling within the parameters of the IFC code requirement for an adequate water supply.

While the days of putting out a structure fire with a bucket brigade are over, the theology behind the NFPA 1142 requirement for an alternative water supply is the same as the fire wardens' requirement to have leather buckets filled with water placed outside of your home; a water source must be within a close proximity and a way of getting the water to the fire must be accessible by suppression responders (The Colonial Period, 2016).

Additionally, although not explicitly stated within the International Fire Code or the National Fire Protection Association Standard 1142, it was identified through the survey that many fire code officials are accepting automatic fire sprinkler systems as a provision of water supply for fire flow. This coincides with Benfer and Scheffey's (2014) finding that when a sprinkler system is present, significantly less water is used to suppress the fire. Consequently, a fire code official could theorize that with the activation of a properly functioning automatic fire

sprinkler system in the event of a fire, that the amount of water provided by the responding fire apparatus could be sufficient to extinguish the fire.

While challengers have claimed that this is a new and unreasonable requirement that will stifle growth within our community, it is apparent that former fire code officials for Copper Canyon Fire and Medical Authority recognized the necessity for water supply for fire flow in new residential developments and did require as much. While the documents discovered through the research process revealed that different subdivisions had different requirements for water supply, it appears that the fire code requirement was applied in a manner that is fairly consistent with the current application. The three subdivisions that were required to provide fire hydrants supplied by water mains were developed in locations that had water mains accessible within a reasonable distance. The two subdivisions that were required to install fire sprinkler systems within each home were developed a great distance from the water system; therefore, it was reasonable to accept fire sprinklers as an alternative to fire hydrants. Unfortunately, at the time of approval, it was not understood that because the requirement to install the sprinklers was recorded in the CC&Rs, that is was then unenforceable by the town or fire district. Today, when a residential subdivision opts to install fire sprinklers in the homes, in lieu of fire hydrants or a water storage, then that information would be recoded on the final plat.

As the National Commission on Fire Prevention and Control (1973) pointed out over 40 years ago,

A law is effective only to the extent that it is enforced, and so it is with a fire prevention or building code. Many serious building fires have been the result, not of code deficiencies, but of lax enforcement... Vigilance is needed in the review of plans and in

inspection during construction. (National Commission on Fire Prevention and Control, 1973)

With the consistent enforcement of this requirement for water supply, first responders will be better equipped to provide suppression services to our community; which is even more imperative today than even just a few decades ago, as was discovered through the research conducted by UL and NIST (Roman, 2015). Additionally, as water supplies increase throughout the community, the residents will benefit as well through their insurance rating. As the Insurance Services Office reports, “forty percent of your community’s public protection classification (PPC™) grading is based on your water supply” (Insurance Services Office, n.d.).

As Benfer and Scheffey (2014) articulated, “The basic method for controlling building fires by fire departments is through the use of water,” and the assurance of water supplies being available for fire protection is critical to the safety of a community. Through this research, it was determined that as Copper Canyon Fire and Medical Authority previously assessed, the requirement for the provision of water supply for fire flow is mandatory for new subdivision, even in rural areas without a municipal water supply system. Furthermore, it is acceptable to provide the water supply for fire flow either through compliance with the table in Appendix B of the International Fire Code, or NFPA 1142, or in other situations, through the installation of automatic fire sprinkler systems.

### Recommendations

This applied research project assessed the problem of Copper Canyon Fire and Medical Authority coming under scrutiny for enforcement of the fire code requirement for water supply for fire flow, and not knowing if they were legally and appropriately interpreting and applying

the requirement. This project gave the researcher the ability to focus on key areas to provide clarity to be able to provide an answer for the problem.

First, in looking at the legality of the code requirement, it was identified that Copper Canyon Fire and Medical Authority's interpretation, application and enforcement of the fire code is in compliance with Arizona State law. Copper Canyon Fire and Medical Authority is enforcing the State Fire Code, the 2012 IFC, as the minimum standard. Additionally, Copper Canyon Fire and Medical Authority does not require fire sprinkler systems to be installed in one- and two-family residences since they did not have a fire sprinkler ordinance in place before December 31, 2009; thus, complying with A.R.S. § 9-807.

Though fire sprinklers are not required by Copper Canyon Fire in one- and two-family residences, they are acceptable should the developer choose to have them installed rather than providing an on-site water storage in rural areas where water mains are not accessible. It is a recommendation of this research project, at the counsel of the Acting State Fire Marshal, that a policy be created that outlines when it is acceptable to allow fire sprinkler system installations as an alternative water supply method. Furthermore, it is recommended that a written policy be created delineating the acceptable water supply sources for fire flow, and under what conditions each of the sources would be permissible. This new written policy would define that if water mains are accessible within a reasonable distance, connection to the water system would be required; which would provide a fire flow that meets the requirement of the IFC Appendix B. If a water system was not within a reasonable distance, then NFPA 1142 would be utilized to calculate a water supply and flow amount that the developer must provide. Otherwise, it would be acceptable, should the developer, without solicitation, opt to provide automatic fire sprinkler systems in all buildings within the subdivision.

Additionally, it is a recommendation of this research project that Copper Canyon Fire and Medical Authority fire prevention personnel outreach to local elected officials as well as developers to have dialogue regarding this matter. Education is always a priority of community risk reduction. It is projected that with communication and education, the fire code requirements will be better understood and met with less resistance.

Finally, the researcher recommends that Copper Canyon Fire and Medical Authority personnel apply the fire code requirement for water supply with consistency with all new development. The written policy will assist in this; however, as stated previously, laws and policies are only as good as they are enforced. With inconsistent application, it only inspires push back and solicits a lack of confidence in code officials and the codes.

The researcher is confident that other fire agencies within the State of Arizona can utilize this research to assist them with similar conflicts regarding fire code requirements. Since this project began, the researcher has been approached by numerous fire agencies that are currently dealing with this same struggle. Also, it has been brought to the researcher's attention that the developers in Camp Verde that are challenging this requirement are taking their concern to the state legislators level. Hopefully, this research provides clear and logical data to assist elected officials and fire code officials in making informed decisions for their communities, whether small or large.

## References

- Allen, S. (2016, September 14). [Letter to Russ Martin]. Copy in possession of Kristi N. Gagnon.
- Benfer, M.E., & Scheffey, J.L. (2014). *Evaluation of fire flow methodologies*. Quincy, Massachusetts: The Fire Protection Research Foundation. Retrieved from <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/research-reports/for-emergency-responders/fireground-operations/evaluation-of-fire-flow-methodologies>
- Calfee, M.L. (2011). A little fire service history. *Fire Service Info*. Retrieved from <http://www.fireserviceinfo.com/history.html>
- Department of Fire, Building and Life Safety, 4 A.A.C. Title 4. Chapter 36 (2011)
- Durham, F. (2016, October 3). [Letter to Kristi Gagnon]. Copy in possession of Kristi N. Gagnon.
- Haynes, H.J.G. (2016). Fire loss in the united states during 2015. *National Fire Protection Association*. Retrieved from <http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fires-in-the-us/overall-fire-problem/fire-loss-in-the-united-states>
- Insurance Services Office. (n.d.). Water-supply evaluations. *Fire Chiefs Online*. Retrieved from <https://firechief.iso.com/FCWWeb/mitigation/ppc/3000/ppc3010.jsp>
- International Code Council. (2011). *International fire code*. Country Club Hills, Illinois: International Code Council, Inc.
- Jensen, E. (2011). State sprinkler law ends Chandler's debate on them. *The Arizona Republic*. Retrieved from <http://archive.azcentral.com/community/chandler/articles/2011/03/15/20110315chandler-sprinklers-state-law-building-code0315.html>

National Commission on Fire Prevention and Control, (1973). *America Burning*. Washington, DC: Government Printing Office.

National Fire Protection Association. (2011). *NFPA 1142: Standard on water supplies for suburban and rural fire fighting*. Retrieved from [http://codesonline.nfpa.org/NFPA/a/c.html/nfpa\\_1142\\_2012](http://codesonline.nfpa.org/NFPA/a/c.html/nfpa_1142_2012)

Powers and duties; arson investigators, 37 A.R.S. § 37-1383 (2007).

Roman, J. (2015). New fire, new tactics. *NFPA Journal*. Retrieved from <http://www.nfpa.org/news-and-research/publications/nfpa-journal/2015/january-february-2015/features/fire-tactics>

The colonial period, (2016). *New York City Fire Museum*. Retrieved from [http://www.nycfiremuseum.org/history\\_colonial.cfm](http://www.nycfiremuseum.org/history_colonial.cfm)

United States Fire Administration. (2016). *Executive analysis of community risk reduction student manual* (4th ed.). Emmitsburg, MD: Author.

USA.com. (n.d.). Retrieved from <http://www.usa.com/camp-verde-az.htm>

Witt, R. (2016). Letter: Is this what is best for Camp Verde. *Camp Verde Bugle*. Retrieved from <http://www.cvbugle.com/news/2016/sep/21/letter-is-this-what-is-best-for-camp-verde/>



## Appendix A

## Email to Arizona Fire Marshals' Association Requesting Participants for Survey and Survey

---

**Kristi Gagnon**

**From:** Marcina.Sunderhaus@chandleraz.gov  
**Sent:** Thursday, September 22, 2016 8:22 AM  
**Subject:** Fw: Help Needed!

*Cina Sunderhaus*

Fire Marshal  
Chandler Fire, Health & Medical  
O: (480) 782-2135  
[marcina.sunderhaus@chandleraz.gov](mailto:marcina.sunderhaus@chandleraz.gov)

----- Forwarded by Marcina Sunderhaus/COCAZ on 09/22/2016 08:21 AM -----

From: Kristi Gagnon <[KGagnon@CC-FMA.org](mailto:KGagnon@CC-FMA.org)>  
To: "[Marcina.Sunderhaus@chandleraz.gov](mailto:Marcina.Sunderhaus@chandleraz.gov)" <[Marcina.Sunderhaus@chandleraz.gov](mailto:Marcina.Sunderhaus@chandleraz.gov)>  
Date: 09/19/2016 04:36 PM  
Subject: Help Needed!

---

Cina,  
Could you please send this request out to the AFMA membership? Thank you!

Good afternoon fellow colleagues! I am in desperate need of information regarding your application of the fire code requirement for water supply for fire flow. I have local developers that are communicating with local elected officials and state legislators stating that we are inconsistently and improperly enforcing the water supply requirement. Therefore, I would like to get factual information from other jurisdictions as to what is being required in other communities around the state. Would you please be willing to take the survey attached to the link below? The survey will take you less than 5 minutes, and most questions are multiple choice. I particularly need responses from fire code officials that have rural areas within their jurisdiction, but all responses are helpful and appreciated! Thank you very much!

<http://www.surveygizmo.com/s3/3054596/Water-Supply-Requirement>

*Kristi Gagnon - CFI*

Fire Marshal  
Copper Canyon Fire & Medical Authority  
928-567-9401 ext. 8005

Dedicated to Serving the Communities of the Verde Valley

NOTICE: This E-mail (including attachments) is covered by the Electronic Communications Privacy Act, 18 U.S.C. ss 2510-2521, is confidential and is legally privileged. If you are not the intended recipient, you are hereby notified that any retention, dissemination, distribution, or copying of this communication is strictly prohibited. Please delete if received in error and notify sender. Thank you kindly.

## Water Supply Requirement

### Fire Code Water Supply Requirement

This survey is intended to determine the different applications and interpretations of the fire code requirement for water supply for fire flow, specifically in regards to residential development. It is my desire as a Fire Code Official to be consistent with my enforcement of fire code requirements. Thank you for your assistance!

1. What agency do you work for?

2. What fire code are you enforcing?

- ☐ 2015 International Fire Code
- ☐ 2012 International Fire Code
- ☐ Older edition of the International Fire Code
- ☐ 2015 NFPA 1
- ☐ Older edition of NFPA 1
- ☐ Other

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

- ☐ Yes
- ☐ No

4. Do you have a residential fire sprinkler ordinance?

- ☐ Yes
- ☐ No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two-family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

- ☐ Yes
- ☐ No

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

- ☐ Yes  
☐ No

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)



8. Do you review preliminary and final subdivision plats?

- ☐ Yes  
☐ No

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

- ☐ Yes  
☐ No

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

- ☐ Yes  
☐ No

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?



12. Do you approve new subdivisions that provide no water supply for fire flow?

☐ Yes

☐ No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?



Submit

0%

Survey Software powered by SurveyGizmo  
**surveygizmo**

## Appendix B

## Interview with Arizona State Fire Marshal's Office

**Kristi Gagnon**

**From:** Dan Ierley <DanIerley@forestryandfire.az.gov>  
**Sent:** Tuesday, September 20, 2016 9:11 AM  
**To:** Kristi Gagnon  
**Cc:** Frederick Durham  
**Subject:** RE: Clarification Needed

Let me know if there is anything else I can do for you

*Dan Ierley*  
*Deputy Fire Marshal I / Plans Reviewer*  
*Arizona State Fire Marshals Office*  
*1110 W. Washington*  
*Phoenix, AZ 85007*  
*(602) 850-1719*

**From:** Kristi Gagnon [mailto:KGagnon@CC-FMA.org]  
**Sent:** Tuesday, September 20, 2016 7:41 AM  
**To:** Dan Ierley <DanIerley@forestryandfire.az.gov>  
**Subject:** Clarification Needed

Good morning Dan,

I know we have communicated on this issue previously, but if I could get your clarification one more time, preferably in email form so developers can't say that I am lying, I would greatly appreciate it.

1. Does your office review plans for one- and two-family residences (home coming in individually in an established neighborhood)?  
*We do, just extremely rare. Its because our jurisdiction is specific to county, state, schools, and places that do not provide fire inspections for themselves it is not a function that we are called upon to do (probably twice in three years)*
2. If not, how do you "justify" not requiring water supply for fire flow?  
*-We do not have a residential fire sprinkler ordinance; therefore, do not review plans for one- and two- family residences. We accept our water tenders as water supply for these homes in existing neighborhoods. Is this consistent with State interpretation and application of the 2012 IFC?*  
*When we are calculating fire flow through NFPA 1142, we do allow for the water storage requirement to be decreased in the amount of water that the local fire department will be bringing to the scene (i.e. Water storage required is 10k gallons, fire department brings 2k gallons, they will be required to store at a minimum 8k gallons)*
2. Do you review preliminary and final plat plans for subdivisions?  
*We do not require preliminary review for subdivisions, but our customers tend to want that so it is a service that we provide, just not required*
4. Do you require new subdivisions, coming in for plat approval, to provide a water supply for fire flow in accordance with 2012 IFC 507.1?  
*Yes, we require them the meet the fire flow requirements*
5. Do you still require water supply for fire flow to be provided even when no water mains are available?  
*Yes, if they can't meet the required fire flow from IFC, then we require them to meet NFPA 1142*
6. If the previous answer is yes, how can a builder provide water supply for fire flow when no water mains are available?  
*-Currently we DO require a water supply to be provided even when no water mains are available. We will accept a water storage and connection in accordance with NFPA 1142 or the developer can opt to install residential fire*

sprinklers in each building and residence. Additionally, the developer has the option to provide another proposal approved by a fire protection engineer that will somehow provide adequate on-site water supply for fire flow. Is this consistent with State interpretation and application of the 2012 IFC?

Yes, it is consistent with our interpretation and application of IFC; with the exception that we do not make the trade of fire flow for sprinklers. If they are required to install fire sprinklers then they will, and they will also meet the fire flow requirements for suppression

7. Do you approve subdivisions that provide no water supply for fire flow?

Not since I have been the plans examiner, I cannot speak for past examiners or previous supervisors variances

8. If the previous answer is yes, how do you "justify" this in regards to the 2012 IFC 507.1 requirement?

-Currently we DO NOT approve subdivisions in the plat stage that do not provide adequate on-site water supply for fire flow in one of the ways mentioned above. Is this consistent with State interpretation and application of the 2012 IFC?

Thank you so much for your help! Your feedback is greatly needed and greatly appreciated! Thank you!

*Kristi Gagnon - CFI*

Fire Marshal  
Copper Canyon Fire & Medical Authority  
928-567-9401 ext. 8005

Dedicated to Serving the Communities of the Verde Valley



**Arizona State Fire Marshal's Office**

Frederick Durham - Acting Arizona State Fire Marshal

September 21, 2016 at 4:30 PM

1. *Is there state legislation that requires municipalities or fire agencies to enforce the same fire code as the State Fire Marshal's Office, or a newer edition?*  
Yes. ARS 37-1383 and Arizona Administrative Code Title 4, Chapter 36, Article 2
2. *Is a municipality or fire agency in violation of State law or policy if they are not enforcing the same minimum standards as the State Fire Marshal's Office?*  
Yes. In 2015, the Governor approved the 2012 IFC to be the State Fire Code, which became effective January 1, 2016.
3. *If a municipality or fire district chose to not adopt a fire code, would the code adopted by the State Fire Marshal's Office be the default code? Would a developer have to abide by the State adopted code anyways?*  
Yes.
4. *Can a municipality or fire district choose to enforce a lesser restrictive code than what the State Fire Marshal's Office has adopted?*  
Not if they are to be considered compliant with state law.
5. *Can a municipality or fire district amend sections out of the adopted fire code and still be in compliance with state requirements? Example: Could the Town of Camp Verde amend the 2012 IFC to eliminate the requirement for water supply for fire flow?*  
No, not really. The State Fire Marshal's Office could then come in as the authority having jurisdiction and then all development would have to be run through our office. But we don't want that. We want local fire agencies to provide their own enforcement. Agencies can find equivalent alternatives to the fire code that meet the intent of the code, but they cannot just eliminate a portion of the code. And if Camp Verde decided to not require water supply, the residents would suffer; insurance companies are starting to not insure homes that have an ISO rating of 10. Also, the requirement for water supply is not new to the 2012 edition. The requirement was even in the 1988 Uniform Fire Code.
6. *Lastly, as I mentioned in my previous email, currently our fire district accepts residential fire sprinkler systems as an adequate water supply for residences within new subdivisions coming in for plat approval. With this being inconsistent with the state application of the requirement for water supply, are we in violation of any state laws or policies? Do we need to bring our enforcement into alignment with the State Fire Marshal's Office interpretation and application and require water supply (in the form of water mains and hydrants or water storage and connections) regardless of sprinkler installation?*  
It is perfectly legal for you to accept fire sprinklers in lieu of NFPA 1142 water storage. In all reality, the fire sprinklers provide better protection than a few thousand gallons of water sitting in a tank anyways. But this needs to be put in writing as a policy, so that it is done evenly, fairly and uniformly. Also, you cannot tell developers to install fire sprinklers, or even say, "if you stall sprinklers as fire flow, then..." and so on. That would be in conflict with ARS 9-807.
7. *Thank you. Would you be willing to write a letter on your letterhead stating the position of the State Fire Marshal's Office?*  
Yes.



Douglas A. Ducey  
Governor

## Office of the State Forester

### Department of Forestry and Fire Management



Jeffery C. Whitney  
State Forester

Frederick Durham  
Acting State Fire Marshal

Cell 520-338-4425  
Office 602-364-1080  
FrederickDurham@forestryandfire.az.gov

October 3, 2016

Kristi Gagnon  
Fire Marshal  
Copper Canyon Fire & Medical Authority  
26B Salt Mine Road  
Camp Verde, AZ

**RE: Arizona State Fire Code**

Dear Fire Marshal Gagnon,

Firstly, the current Arizona State Fire Code is the 2012 International Fire Code as amended and adopted. This code satisfies the legal requirement set out in ARS § 37-1383. By this statute this code is the minimum standard for the safeguarding of life and property from fire and fire hazards. Furthermore, as stated in the Arizona Administrative Code, Title 4, Chapter 36, Article 2:

Unless otherwise provided by law, any person residing, doing business, or who is physically present within the state of Arizona shall comply with the provisions of the International Fire Code (2012 Edition), including D102.1 and D107.1 of Appendix D and all provisions of Appendices B, C, E, F, G, H, I, and J, which is published by the International Code Council, incorporated by reference as the State Fire Code, and modified by Article 3. The incorporated material does not include any later amendments or editions....

As referenced, this adopted code sets the minimum standards for all fire codes in the state. While any jurisdiction may adopt its own fire code, it must set standards of protection and prevention no less than those contained within the state fire code.

This being said, there is leeway in how the fire code is applied. Of particular issue is the requirements for fire flow as applied in Appendix B. B101.1 sets "The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix." All buildings have a determined fire flow requirement calculated by the construction type, and floor area of the building. These flow rates are from one thousand gallons per minute for a single family home less than three thousand six hundred square feet, to eight thousand gallons per minute on a large structure.

Understanding that these fire flows may not be available in all areas there are two specific modifications within the fire code. Firstly, section B103.1 allows the fire chief to reduce the fire flow requirements for isolated buildings or group of buildings in rural areas or small communities where the development of full fire flow requirements is impractical. This section does allow for a reduction of flow requirements, it has no numeric value attached as to how much it may be reduced. This section also does not state that fire flow may be eliminated entirely, just a reduction may be authorized.

**Duty • Respect • Integrity**

1110 West Washington Street, Suite 100 • Phoenix, Arizona 85007 • Main: (602) 771-1400 • Fax: (602) 364-1052



October 3, 2016  
Page 2

The second part of the fire flow modification that this office applies on a regular basis is section B103.3 "Areas without water supply systems". This specifically applies to rural and suburban areas without water supply systems. Using the calculations as provided by NFPA 1142, sufficient water supply systems utilizing tanks or other water sources are approved.

Any construction within your fire district may be approved using either of the above methods for determining a reasonable fire flow for the occupancy and type of construction. When utilizing these methods for reduction, other factors may be considered, including but not limited to; fire sprinklers, building construction type, building separation, etc.

Ultimately it is the decision of the Fire District and the community as to the level of protection afforded the residents of your town. Without a reliable and sufficient water supply for firefighting activities, the risk of fire to buildings and their occupants is increased.

Very truly yours,



Frederick Durham  
Acting State Fire Marshal

## Appendix C

### Survey Responses

Response #1

DATA

DETAILS

ACTION LOG

Customize

NEED HELP

Submitted: Sep 19, 2016 5:19 PM

Add Tag to Response

Share

Comments

### 1. Fire Code Water Supply Requirement

Edit

- What agency do you work for?  
CAFMA  

Add Tag to Answer
- What fire code are you enforcing?  
2012 International Fire Code
- Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
No
- Do you have a residential fire sprinkler ordinance?  
Yes
- If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)
- If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)
- If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)
- Do you review preliminary and final subdivision plats?  
Yes
- Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes
- Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
Yes
- What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?  

Individual 13D residential sprinkler systems.

Water tank and hydrants.

Add Tag to Answer

Select Quote
- Do you approve new subdivisions that provide no water supply for fire flow?  
No
- If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #2

Customize

NEED HELP?

DATA

DETAILS

ACTION LOG

Submitted: Sep 20, 2016 10:32 AM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

1. What agency do you work for?

Golder Ranch Fire District

Add Tag to Answer

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

No options for new subdivisions

Add Tag to Answer

Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #3

[Customize](#)

[DATA](#)
[DETAILS](#)
[ACTION LOG](#)

[NEED HELP?](#)

Submitted: Sep 20, 2016 10:39 AM
[Add Tag to Response](#)
[Share](#)
[Comments](#)

### 1. Fire Code Water Supply Requirement

[Edit](#)

1. What agency do you work for?

Sedona Fire District

[Add Tag to Answer](#)

2. What fire code are you enforcing?

Older edition of the International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

No

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Questions #10 & #11: I do not require water supply for an existing subdivision that does not meet fire flow requirements. I would use alternate means and methods. An example could be NFPA 1142.

[Add Tag to Answer](#)
[Select Quote](#)

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?



Response #4

DATA

DETAILS

ACTION LOG

Customize

NEED HELP?

Submitted: Sep 20, 2016 2:33 PM

Add Tag to Response

Share

Comments

### 1. Fire Code Water Supply Requirement Edit

- What agency do you work for?  
Cottonwood Fire & Medical Department  
Add Tag to Answer
- What fire code are you enforcing?  
2012 International Fire Code
- Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
No
- Do you have a residential fire sprinkler ordinance?  
Yes
- If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)
- If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)
- If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)
- Do you review preliminary and final subdivision plats?  
Yes
- Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes
- Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
Yes
- What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?  
In our area we do have mains available, and we require all water systems to be install, tested and accepted before combustible arrive on site  
Add Tag to Answer Select Quote
- Do you approve new subdivisions that provide no water supply for fire flow?  
No
- If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?  
N/A

Response #5

Customize

DATADETAILSACTION LOG

NEED HELP?

Submitted: Sep 20, 2016 5:35 PM

Add Tag to Response
Share
Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Prescott

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Above ground mains connected to a city water supply. They have to be able to provide fire flows before bringing combustibles onto the job site.

Add Tag to Answer
Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

We require water because we have a city water system but I believe that you can use residential sprinklers to meet the fire flow requirement but that doesn't help with the construction part

Response #6

Customize

DATADETAILSACTION LOG

NEED HELP?

Submitted: Sep 21, 2016 4:18 PM

Add Tag to Response
Share
Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?  
Mayer Fire District

2. What fire code are you enforcing?  
2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
No

4. Do you have a residential fire sprinkler ordinance?  
Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?  
Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?  
Water tanks sufficient for fire flow (costly). Some large parcel subdivisions will sprinkle their homes as an alternative. There have been times historically under previous administrations merely access was acknowledged.

Add Tag to Answer
Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?  
Yes

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?  
Depending on the size and access some large parcel areas (5 plus acres) have been approved due to merely the fact there is no water available in the district. Fire sprinkler systems with storage tanks off the well have been performed.

Response #7

Customize

DATA

DETAILS

ACTION LOG

NEED HELP?

Submitted: Sep 22, 2016 11:27 AM

Add Tag to Response
Share
Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Golder Ranch Fire District

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Sprinkler

Add Tag to Answer
Select Quote

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Sprinkler

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Depends on size of subdivision



Response #8

DATA

DETAILS

ACTION LOG

Customize

NEED HELP?

Submitted: Sep 22, 2016 11:27 AM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Casa Grande Fire

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

No

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

If they are just one or two homes, we do not require they meet unless the home exceeds 3600 sq feet. However, if it is a subdivision of lots that would allow for more than two homes we require they meet the flow with water storage or provide the home with fire sprinklers per NFPA 13D

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Either water storage tanks or providing fire sprinklers per NFPA 13D. By doing so we are allowing an alternative method to help make sure the project/development can happen. Sprinklers here are an alternative water source, not an ordinance.

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

You can't

Response #9

DATA

DETAILS

ACTION LOG

Customize

NEED HELP?

Submitted: Sep 22, 2016 11:40 AM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

City of Buckeye

Add Tag to Answer

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

Yes

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

We require them to tie into the water system or work with other developers for a regional water campus, using a private water company.

Add Tag to Answer

Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

We have it in our City Ordinance since 2003.

Response #10

[Customize](#)

DATA

DETAILS

ACTION LOG

[NEED HELP?](#)

Submitted: Sep 22, 2016 11:42 AM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Glendale Fire Department

[Add Tag to Answer](#)

2. What fire code are you enforcing?

Older edition of the International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

No

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Section 507.5.1 (amended) requires a hydrant be within 150 feet. Either the builder must locate the home to meet the distance to existing hydrants in the area or provide a hydrant to meet this requirement.

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Developers must either use the municipal water source or secure private water company service. Example: new developments planned for the 303 area between Camleback and Northern are contracting with a private water companies to meet this requirement. While it has not been suggested, i would not approve limited quantity elevated tanks to serve as the primary water supply. However, in rural areas my position on this may be different.

[Add Tag to Answer](#)
[Select Quote](#)

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?



Response #11

[Customize](#)

[DATA](#)
[DETAILS](#)
[ACTION LOG](#)

[NEED HELP?](#)

Submitted: Sep 22, 2016 11:43 AM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

## 1. Fire Code Water Supply Requirement [Edit](#)

- What agency do you work for?  
Golder Ranch Fire District  
[Add Tag to Answer](#)
- What fire code are you enforcing?  
2012 International Fire Code
- Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
No
- Do you have a residential fire sprinkler ordinance?  
No
- If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Yes
- If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Yes
- If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
We review one and two family residences to make sure they have the required fire flow. We have several areas with out hydrants that can not provide the required fire flow and in that situation in our review letter we write something along the lines of...  
  
The required fire flow shall be provided. As an alternative a fire sprinkler system compliant with NFPA 13D can be installed to offset the need for the additional fire flow.  
  
In this situation even houses less than 3600 sf have sprinklers in our area. Most people don't have any issues.
- Do you review preliminary and final subdivision plats?  
Yes
- Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes
- Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
Yes
- What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?
- Do you approve new subdivisions that provide no water supply for fire flow?  
No
- If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

## Response #12

[Customize](#)

DATA

DETAILS

ACTION LOG

[NEED HELP?](#)

Submitted: Sep 22, 2016 12:19 PM

[Add Tag to Response](#) [Share](#) [Comments](#)

## 1. Fire Code Water Supply Requirement

[Edit](#)

1. What agency do you work for?

Scottsdale Fire Dept.

[Add Tag to Answer](#)

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

Yes

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Water tanks with pumps.

[Add Tag to Answer](#)[Select Quote](#)

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #13

[Customize](#)

[DATA](#)
[DETAILS](#)
[ACTION LOG](#)

[NEED HELP?](#)

Submitted: Sep 22, 2016 12:27 PM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

1. Fire Code Water Supply Requirement

[Edit](#)

1. What agency do you work for?  
Bullhead City Fire  

[Add Tag to Answer](#)

2. What fire code are you enforcing?  
2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
No

4. Do you have a residential fire sprinkler ordinance?  
No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
No

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
We have one old sub-division without water. City has an ordinance that if they build in this area, a residential sprinkler system shall be installed.

8. Do you review preliminary and final subdivision plats?  
Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?  
The only option is to bring water in. Or, large water tank sufficient for fire flow for two hours, pump if necessary.  

[Add Tag to Answer](#)
[Select Quote](#)

12. Do you approve new subdivisions that provide no water supply for fire flow?  
No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?  
n/a

## Response #14

[Customize](#)

[DATA](#)
[DETAILS](#)
[ACTION LOG](#)

[NEED HELP?](#)

Submitted: Sep 22, 2016 12:37 PM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

### 1. Fire Code Water Supply Requirement

[Edit](#)

- What agency do you work for?  
City of Maricopa Fire Dept.  
[Add Tag to Answer](#)
- What fire code are you enforcing?  
2012 International Fire Code
- Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
No
- Do you have a residential fire sprinkler ordinance?
- If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Yes
- If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Yes
- If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Provide a water source equal to the minimum fire code located in Appendix-B section B105  
[Add Tag to Answer](#) [Select Quote](#)
- Do you review preliminary and final subdivision plats?  
Yes
- Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes
- Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
Yes
- What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?  
We allow for temporary buildings such as construction offices in subdivisions. Permanent structures and residential are require to meet the fire flow requirements.
- Do you approve new subdivisions that provide no water supply for fire flow?  
No
- If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?  
104.8  
Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, the fire code official shall have the authority to grant modifications for individual cases, provided the fire code official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety requirements. The details of action granting modifications shall be recorded and entered in the files of the department of fire prevention.



Response #15

DATA

DETAILS

ACTION LOG

Customize

NEED HELP?

Submitted: Sep 22, 2016 12:38 PM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Northwest Fire District

Add Tag to Answer

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

We will accept sprinklers as an alternative design method.

Add Tag to Answer

Select Quote

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Above ground tanks

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?



**Response #16**Customize

DATA DETAILS ACTION LOGNEED HELP?

Submitted: Sep 22, 2016 12:52 PMAdd Tag to Response Share Comments

### 1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Prescott Fire Department

Add Tag to Answer

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Provide residential sprinklers with pump and tank

Add Tag to Answer Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Each home will be required to have a fire sprinkler system

Response #17

[Customize](#)

DATA

DETAILS

ACTION LOG

NEED HELP?

Submitted: Sep 22, 2016 1:07 PM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Brown & Associates – Various AHJ's

[Add Tag to Answer](#)

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Establish fire flow through the use of NFPA 1142 and enforcement of the 2012 IWUIC

[Add Tag to Answer](#)
[Select Quote](#)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Fore existing subdivisions use NFPA 1142 and 2012 IWUIC. For new subdivisions install tanks, pumps, water mains and hydrants meeting requirements of IFC Section 507 and Appendix B.

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #18

[Customize](#)

[DATA](#)
[DETAILS](#)
[ACTION LOG](#)

[NEED HELP?](#)

Submitted: Sep 22, 2016 1:16 PM
[Add Tag to Response](#)
[Share](#)
[Comments](#)

### 1. Fire Code Water Supply Requirement

[Edit](#)

1. What agency do you work for?

City of Scottsdale Fire

[Add Tag to Answer](#)

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

Yes

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Will always make sure that our COS fire flows are in place for new developments. Some older developments have had to provide on-site storage for the sprinkler flow.

[Add Tag to Answer](#) [Select Quote](#)

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Don't think you can justify not somehow addressing this primary need for FD. If they are providing domestic, there should be a way to provide for fire flow and/or sprinkler flow.

Response #19

Customize

DATADETAILS ACTION LOG

NEED HELP?

Submitted: Sep 22, 2016 2:25 PM

Add Tag to Response
Share
Comments

### 1. Fire Code Water Supply Requirement Edit

- What agency do you work for?  
Casa Grande  
Add Tag to Answer
- What fire code are you enforcing?  
2012 International Fire Code
- Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
Yes
- Do you have a residential fire sprinkler ordinance?  
No
- If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
No
- If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Yes
- If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
On residential we have a 5,000 or greater requirement for fire sprinklers on resident  
Add Tag to Answer Select Quote
- Do you review preliminary and final subdivision plats?  
Yes
- Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes
- Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
Yes
- What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?  
Residential sprinklers or a fire service water supply. But they pretty much need a water source to keep the supply full.
- Do you approve new subdivisions that provide no water supply for fire flow?  
No
- If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?



Response #20

DATA

DETAILS

ACTION LOG

Customize

NEED HELP?

Submitted: Sep 22, 2016 2:24 PM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Sun City Fire & Medical Department

Add Tag to Answer

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Same Types as required in 2012 IFC 507.2

Add Tag to Answer

Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #21

DATA

DETAILS

ACTION LOG

Customize

NEED HELP?

Submitted: Sep 22, 2016 3:09 PM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Tucson Fire Department

Add Tag to Answer

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Add fire sprinklers

Add Tag to Answer

Select Quote

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Above ground water storage tanks

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #22

DATA

DETAILS

ACTION LOG

Customize

NEED HELP?

Submitted: Sep 22, 2016 4:19 PM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Mesa Fire and Medical

Add Tag to Answer

2. What fire code are you enforcing?

Older edition of the International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

No

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

IFC 2006 503.1 and City of Mesa Fire Code Amendment 503.1.1

Add Tag to Answer

Select Quote

8. Do you review preliminary and final subdivision plats?

No

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Development Services Division decides that.

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #23

Customize
NEED HELP?

DATADETAILSACTION LOG

Submitted: Sep 22, 2016 4:44 PM

Add Tag to ResponseShareComments

### 1. Fire Code Water Supply Requirement Edit

1. What agency do you work for?

Fry Fire District

Add Tag to Answer
2. What fire code are you enforcing?

2012 International Fire Code
3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No
4. Do you have a residential fire sprinkler ordinance?

No
5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

No
6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

No
7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Cochise county enforces the >3,600 sq ft rule in appendix B. They require these large homes to be sprinklered but it is not tied to whether or not they are able to meet the minimum hydrant flow as almost no areas meet that requirement anyways.

Add Tag to AnswerSelect Quote
8. Do you review preliminary and final subdivision plats?

Yes
9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes
10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes
11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Since we have poor water infrastructure we do come in heavy with appendix B and then negotiate down to 13D sprinkler systems and/or NFPA 1142

Add Tag to AnswerSelect Quote
12. Do you approve new subdivisions that provide no water supply for fire flow?

Yes
13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

This is a difficult question. My predecessor did approve areas with no water supply in trade for a sprinkler in every house. I have not been put in the position to have to decide on this yet. Mike McKearney 520-458-5523 if you need anything. good luck



Response #24

[Customize](#)

[DATA](#)
[DETAILS](#)
[ACTION LOG](#)

[NEED HELP?](#)

Submitted: Sep 22, 2016 5:02 PM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

1. Fire Code Water Supply Requirement

1. What agency do you work for?

Drexel Heights

[Add Tag to Answer](#)

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Tank and pump that will function and supply water to sprinklers for the duration time it takes an engine to arrive

[Add Tag to Answer](#)
[Select Quote](#)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

100% sprinkler homes

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Must meet fire flow in some capacity

Response #25

Customize

NEED HELP?

DATA

DETAILS

ACTION LOG

Submitted: Sep 22, 2016 6:09 PM

Add Tag to Response

Share

Comments

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Town of Paradise Valley

Add Tag to Answer

2. What fire code are you enforcing?

2015 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Have not an an instance were that became a factor.

Add Tag to Answer

Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #26

Customize
NEED HELP?

DATADETAILSACTION LOG

Submitted: Sep 22, 2016 6:31 PM

Add Tag to ResponseShareComments

1. Fire Code Water Supply Requirement
Edit

1. What agency do you work for?  
Surprise Fire Medical  
Add Tag to Answer

2. What fire code are you enforcing?  
2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?  
Yes

4. Do you have a residential fire sprinkler ordinance?  
No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)  
Surprise adopted the Urban Land Interface Code, which states if you do not have an adequate water supply you shall sprinkler the home. The sprinkler design is off what is available.

8. Do you review preliminary and final subdivision plats?  
Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?  
Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?  
No

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?  
when no water mains are available then the homes shall be sprinklered, the sprinkler design shall be based on available domestic water and pressure.  
Add Tag to AnswerSelect Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?  
No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Response #27

[Customize](#)

DATA

DETAILS

ACTION LOG

NEED HELP?

Submitted: Sep 22, 2016 7:02 PM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Payson Fire

[Add Tag to Answer](#)

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

No

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

Yes

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

We use Appendix B and we have amended it to basically state that a supply of 1500 GPM be available within 600 feet travel distance. If they cannot meet this they either have to install a source or sprinkler the building.

[Add Tag to Answer](#)
[Select Quote](#)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

No

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

They must install water mains.

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?



Response #28

[Customize](#)

DATA

DETAILS

ACTION LOG

NEED HELP?

Submitted: Sep 26, 2016 1:24 PM

[Add Tag to Response](#)
[Share](#)
[Comments](#)

1. Fire Code Water Supply Requirement

Edit

1. What agency do you work for?

Lake Havasu City Fire Department

Add Tag to Answer

2. What fire code are you enforcing?

2012 International Fire Code

3. Do you have an amendment to the fire code addressing water supply for fire flow (2012 IFC 507.1)?

No

4. Do you have a residential fire sprinkler ordinance?

Yes

5. If you DO NOT have a residential fire sprinkler ordinance, do you review plans for one- and/or two- family residences? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

6. If you DO NOT have a residential fire sprinkler ordinance, do you require one- and two- family residences to meet the requirement for water supply for fire flow? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

7. If you DO NOT have a residential fire sprinkler ordinance, and DO require one- and two- family residences to have a water supply for fire flow, how can a builder meet that requirement when a fire hydrant is not available? This refers to plans coming in individually in already established neighborhoods. (If you do have a residential fire sprinkler ordinance, please skip the question.)

8. Do you review preliminary and final subdivision plats?

Yes

9. Do you require new subdivisions to meet the requirement for water supply for fire flow?

Yes

10. Do you require the new subdivision to provide water supply for fire flow when no water mains are available?

Yes

11. What options are acceptable for a subdivision developer to provide for water supply for fire flow when no water mains are available?

Water mains would be required to be installed by the developer.

Add Tag to Answer

Select Quote

12. Do you approve new subdivisions that provide no water supply for fire flow?

No

13. If you do approve new subdivisions that have no water supply for fire flow, how do you justify this in regards to the fire code requirement?

Appendix D

Millwood Estates Covenants, Conditions, and Restrictions

Ana Wayman-Trujillo, Recorder  
OFFICIAL RECORDS OF YAVAPAI COUNTY  
TOWN OF CAMP VERDE RES

B-4380 P-123  
03/31/2006 02:00P  
12.00 3994774



B-4380 P-123  
Page: 1 of 21  
RES 3994774

**AZNORTH ENTERPRISES, LLC.**

**MILLWOOD ESTATES**

**DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS**



MAIL TO:

AZNORTH ENTERPRISES, LLC  
725 Howards Rd. Suite B, Camp Verde, AZ 86322  
PHONE: 928-567-2964 FAX: 928-567-8809



B-4380 P-123  
Page: 2 of 21  
RES 3994774

**DECLARATION OF COVENANTS, CONDITIONS AND  
RESTRICTIONS  
FOR  
MILLWOOD ESTATES**

---

This Declaration of Covenants, Conditions and Restrictions (hereinafter the "Declarant"), made this 18<sup>th</sup> day of January 2006, by AZNORTH Enterprises, L.L.C., an Arizona corporation, (hereinafter the "Declarant").

WHEREAS, Declarant is the Owner of real property in Yavapai County, Arizona (hereinafter the "Property") more particularly described on Exhibit "A" attached hereto.

WHEREAS, Declarant desires to establish and maintain the rural nature of the property for the benefit of all owners;

NOW, THEREFORE, Declarant declares that the Property is and shall be held, conveyed, encumbered, leased and used subject to the following covenants, conditions and restrictions which are for the purpose of enhancing and protecting the value of the Property. The covenants, conditions and restrictions set forth herein shall run with the Property; shall be binding upon all persons having any interest in the Property; shall inure to the benefit of and be binding upon Declarant, its successors, each Owner and their successors; and may be enforced by Declarant or its successors, by any Owner or their successors, or by any entity having an interest in the Property.

**ARTICLE I**

**DEFINITIONS**

Unless the context otherwise specifies or requires, the following words and phrases shall have the following meanings:

Section 1.01 "Assessments" means the Annual Assessment and any Special Assessments.

Section 1.02 "Assessment Lien" means the lien created and imposed by Sections 3.05 hereof.

Section 1.03 "Association" means Millwood Estates' Homeowner's Association, an Arizona non-profit corporation.





B-4380 P-123  
Page: 3 of 21  
RES 3894774

Section 1.04 "Board" means the Board of Directors of the Association.

Section 1.05 "Bylaws" means the Bylaws of the Association as the same may be amended or supplemented from time to time.

Section 1.06 "Common Maintenance Areas" mean those areas within the subdivision which are designated on the final plat of Millwood Estates as being common areas, pedestrian easements, utility easements, roadways and/or roadway easements, along with drainage and retention easements. Ownership and control of all easements, except utility easements, dedications, or right-of-ways, shall be vested in the Declarant until transferred to the Association pursuant to Article III.

Section 1.07 "Declarant" means AZNORTH Enterprises, L.L.C., an Arizona corporation, its successors, or assigns.

Section 1.08 "Declaration" shall mean the covenants, conditions and restrictions herein set forth in this entire document, as the same may be from time to time amended.

Section 1.09 "Dwelling Unit" shall mean the structure constructed on a lot, designated to be used as a place of residence.

Section 1.10 "Improvement" or "Improvements" shall mean any and all alterations of the land, other than interior modifications of existing structures, including, but not limited to, outbuildings, armadas, garages, guest houses, servant's quarters, swimming pools, walls, fencing, stables, landscaping and driveways, whether intended to be temporary or permanent.

Section 1.11 "Lot" shall mean those parcels of real property shown on the recorded subdivision plat.

Section 1.12 "Member" means a lot owner in the Subdivision and a member of the Association.

Section 1.13 "Owner" shall mean (1) the record Owner, whether one or more persons of legal title in the fee simple of any Lot, or (2) the purchaser of a lot under a recorded executory contract for the sale of real property. The foregoing does not include persons who hold a interest in a lot as security for the performance of an obligation, or a lessee or tenant, or a purchaser under an executory contract of sale which has not "closed" and been recorded in the Office of County Recorder of Yavapai County, Arizona.

Section 1.14 "Person" shall mean an individual or any other entity with the legal right to hold title to real property.

Section 1.15 "Plat" shall mean the final subdivision plat for the Millwood Estates property recorded in the Office of the County Recorder of Yavapai County, Arizona.





B-4380 P-123  
Page: 4 of 21  
RES 3994773

Section 1.16 "Property" or Subdivision" shall mean Millwood Estates, as described on the plat recorded in the Office of the Yavapai County Recorder.

## ARTICLE II

### USES AND RESTRICTIONS

Without the written permission of the Architectural Review Committee first obtained in accordance with Article IV, no person or entity of any nature shall commence or maintain any improvements of any nature upon any of said Lots, including without limitation excavation, site preparation, tree removal, demolition of existing improvements, landscaping, fences, walkways, roadways, driveways, signs, exterior lights, foundations, exterior painting, walls or buildings of any nature (other than repainting in colors substantially similar to the colors originally approved). In no event shall the Architectural Review Committee approve any buildings or improvements, nor shall any buildings or improvements be constructed or maintained upon any of said Lots, which violate any of the following restrictions.

#### Section 2.01 Construction and Architectural Restrictions

- A. There may be erected on any one lot not more than one single-family residence plus such accessory and auxiliary garages, barns and tack rooms as are incidental to the single-family residential use. All structures erected or maintained on any lot or tract must be of new construction and no buildings or structures may be moved from any other location onto said lots or tracts.
- B. Only detached single-family dwellings containing a minimum livable area of Two Thousand Three Hundred (2,300) square feet may be erected on any lot. Guest quarters may be erected to be occupied solely by non-paying guests or servants. Any quarters for guests or servants shall be attached to the main residence. All construction for the guest quarters will be of the same type and materials as the main residence and comply with current County standards for guest quarters.
- C. The height of such dwelling may not exceed thirty-five (35) feet.
- D. Each single-family dwelling must have a minimum 2-car garage with a floor area of not less than Four Hundred (400) square feet.



B-4380 P-123  
Page: 5 of 21  
RES 3994774

- E. All building slabs shall be elevated above the 100 year flood plain.
- F. All dwellings must have standard architectural appearance and no non-conventional home may be constructed.
- G. The exterior of the main residence shall be of non-combustible limited flame spread material, with the exception of log homes, which shall be constructed with 8" diameter peeled logs, either round, swan or hewn. Other construction materials may consist of masonry or rock, redwood and/or cedar materials. Straw Bale type housing will have conventional appearance and follow architectural guidelines and combustionable material standards. House colors must be earth-tone colors (i.e., browns, grays, soft greens, etc.). No bright or garish colors may be used.
- H. Roofing materials for the main residence, and any outbuildings shall be a class-A roof as defined by the Uniform Building Code, and shall be earth-tone colored metal, cooper metal roofing, concrete tile, fiberglass shingles, or clay tile. No reflective or white roofing materials shall be permitted. Corrugated metal roofing, composite asphalt, or rolled type asphalt roofing will not be permitted. Single-family residence shall have a minimum roof pitch of five feet (5') in twelve feet (12'), 5'/12'. All roof eaves shall be enclosed using non-combustible materials.
- I. Exterior decks and side enclosures shall be of a non-combustible limited flame spread material, and shall be constructed with 8' or larger structural beams or peeled logs, as described in the Uniform Building Code. Storage will not be allowed under the deck. Patio covers will be constructed using heavy timber or non-combustible materials (no light weight, easily ignited materials).
- J. No galvanized steel, press board, masonite, T-111 type plywood, corrugated or aluminum corrugated panels may be used for exterior construction of any type.
- K. Outbuildings may not exceed twenty (20) feet in height.
- L. A garage or similar structure may be erected on a lot prior to construction of the primary single-family residence; however, construction of the primary residence must be commenced within one year.
- M. All utility services such as electricity, telephone, water lines, gas lines, water storage tanks, or storage tanks of any other nature shall be installed underground in accordance with local county codes at the time of installation, and subject to the requirements of the supplying utility company.
- N. Septic systems on all lots shall be installed and maintained in accordance with the standards of the Yavapai County Health Department and the Arizona Department of Environmental Quality. Only designed alternative, anarobic septic systems are allowed in the Millwood Estates Subdivision. They shall be properly landscaped so as to blend in with the area.
- O. All exterior construction of any buildings permitted hereunder must be completed within twelve (12) months from commencement thereof and conform to standard accepted construction practices. All materials must be new or approved by the Town of Camp Verde Building Inspector. All





B-4380 P-123  
Page: 6 of 21  
RES 3994774

construction shall (i) be according to the rules and regulations governing construction in the Town of Camp Verde (ii) be accomplished under a permit issued by the Town of Camp Verde and (iii) be completed under the latest codes and requirements in effect in the Town of Camp Verde and Yavapai County at the time of construction.

- P. All building and structures within the Millwood Estates subdivision shall occur within, Forty (40) feet from the front or rear of the house and Twenty (20) feet from either side and all buildings will refer to the setbacks as depicted on the final Plat. For the purpose of this covenant steps and unsupported eaves shall not be considered a part of any building or structure, but decks, patios, and support structures shall be considered a part of a structure or building. Building envelopes must be approved prior to start of construction and homes must be built in the building envelopes mandated on the Final Plat.
- Q. No buildings or fences shall be built on or in any easement area or right of way.
- R. Any fences erected on the property shall be constructed in a manner and fashion consistent with the character of the surrounding area. The fencing shall be installed in a neat and professional manner using new materials. All fencing shall be constructed of the following materials: galvanized pipe rail, pressure-treated doweled rail, wood rail, vertical wood slat privacy style, stone or masonry walls up to three feet in height, and pressure treated fence posts with field fence. The finished height of any fence shall not exceed six (6) feet if erected within fifty (50) feet of the property line, nor more than eight (8) feet otherwise. An exception exists for dog runs inconspicuously near buildings or homes. Perimeter Lot fencing must be consistent with existing perimeter fencing.
- S. None of the Lots shall be subdivided into smaller lots, and no portion of any of said Lots or any easement or other interest therein shall be conveyed, leased or otherwise disposed of without the prior written approval of the Declarant. The ownership of two or more adjacent Lots shall, with the written approval of the Declarant, be deemed to constitute a single Lot for the purposes of these restrictions, with one member vote.
- T. All lot owners shall have the right to drill a well on its property with the appropriate permits and required regulations of the Town of Camp Verde and the Arizona Department of Water Resources. All wells must be registered with the Arizona Department of Water Resources. The potable water source (well) may only be used for a maximum of 10,000 sq/feet for house use only.

#### Section 2.02 General Use Restrictions

- A. No boarders or renters of portion of any of said Lots shall be permitted, but an entire lot, together with the improvements thereon, may be rented only to a single family.



B-4380 P-123  
Page: 7 of 21  
RES 3994774

- B. No garage, trailer, mobile home, motor vehicle or any temporary structure of any nature may be used as a permanent residence on any lot or tract. Temporary use is permitted, in small trailers and motor homes, for short periods of time (visitors, family members, home construction). Such temporary use, however, will not exceed a continuous period of two weeks or four weeks in the aggregate during any one-year calendar year, except during home construction the time period may be extended to six months.
- C. No open fires or burning shall be permitted on any Lot and no incinerators or like equipment shall be placed, allowed or maintained upon any Lot. The foregoing shall not be deemed to preclude the use in customary fashion of outdoor barbeques or grills, unless such use is prevented or restricted by fire protection rules or regulations.
- D. All residences must be equipped with smoke detectors and a fire sprinkler system which shall be installed in conformance with NFPA standards as required by the subdivision ordinance of Yavapai County. All exterior building construction materials shall be of limited combustibility. All lot owners shall establish and maintain a defensible space around each structure constructed on a lot. All fireplace chimneys and outlets from stoves, heating appliances and outside fireboxes must be protected from flying sparks by the use of approved spark arrestors. All other fire management issues shall be under the control of the Declarant until control is transferred to the Association.
- E. Due to the possibility of fire, each of the Owners of said Lots shall at all times maintain his entire Lot cleared of hazardous growth, vegetation, dead wood, and other flammable or host materials. Additionally:
- i) All buildings upon said Lots shall have not less than two garden hose outlets with adequate hoses so as to permit a stream of water to be directed at all sides and the roof of said building and all trees and other structures upon such Lot;
  - ii) Each Owner shall own and maintain a sufficient number of fire extinguishers to adequately protect the improvements upon the Lot;
  - iii) No Owner shall maintain any flammable materials or otherwise use his Lot in a manner which would create a fire danger to any of said Lots;
  - iv) Each Owner shall be bound by all fire protection rules and regulations issued by the Developer and Association; Outdoor storage of firewood, kindling or compost material must be stored at least 30' from any structure, unless the material is stored in an approved bin or enclosure. No LPG tanks will be maintained within 30' of any structure.
- F. No motor-driven vehicles of any kind shall make use of any easements or areas set aside for pedestrian use.



## Appendix E

## The Preserve Covenants, Conditions, and Restrictions

TOWN OF CAMP VERDE  
473 S. Main Street  
P.O. Box 710  
Camp Verde, AZ 86322  
Attention: P&Z Dept.

Ana Wayman-Trujillo, Recorder  
OFFICIAL RECORDS OF YAVAPAI COUNTY  
TOWN OF CAMP VERDE RES

B-4372 P-146  
03/09/2006 10:38A  
7.00 3985489



B-4372 P-146  
Page: 1 of 11  
RES 3985489

# DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

## FOR

## The Preserve at Clear Creek

This Declaration of Covenants, Conditions and Restrictions (hereinafter the "Declarant"), made this 1st day of February 2006, by Clear Creek Hinch Springs, LLC, an Arizona limited liability company, (hereinafter the "Declarant").

WHEREAS, Declarant is the Owner of real property in Yavapai County, Arizona (hereinafter the "Property") more particularly described on Exhibit "A" attached hereto.

WHEREAS, Declarant desires to establish and maintain the rural nature of the property for the benefit of all owners;

NOW, THEREFORE, Declarant declares that the Property is and shall be held, conveyed, encumbered, leased and used subject to the following covenants, conditions and restrictions which are for the purpose of enhancing and protecting the value of the Property. The covenants, conditions and restrictions set forth herein shall run with the Property; shall be binding upon all persons having any interest in the Property; shall inure to the benefit of and be binding upon Declarant, its successors, each Owner and their successors; and may be enforced by Declarant or its successors, by any Owner or their successors, or by any entity having an interest in the Property.

## ARTICLE I

### DEFINITIONS

Unless the context otherwise specifies or requires, the following words and phrases shall have the following meanings:

"Declarant" means Clear Creek Hinch Springs, LLC, an Arizona limited liability company, its successors, or assigns.

"Declaration" shall mean the covenants, conditions and restrictions herein set forth in this entire document, as the same may be from time to time amended.

"Dwelling Unit" shall mean the structure constructed on a lot, designated to be used as a place of residence.

"Improvement" or "Improvements" shall mean any and all alterations of the land, other than interior modifications of existing structures, including, but not limited to, outbuildings, armadas, garages, guest houses, servant's quarters, swimming pools, walls,



B-4372 P-146  
Page: 2 of 11  
RES 3985489

fencing, stables, landscaping and driveways, whether intended to be temporary or permanent.

"Lot" shall mean those parcels of real property shown on the recorded subdivision plat.

"Owner" shall mean (1) the record Owner, whether one or more persons of legal title in the fee simple of any Lot, or (2) the purchaser of a lot under a recorded executory contract for the sale of real property. The foregoing does not include persons who hold a interest in a lot as security for the performance of an obligation, or a lessee or tenant, or a purchaser under an executory contract of sale which has not "closed" and been recorded in the Office of County Recorder of Yavapai County, Arizona.

"Person" shall mean an individual or any other entity with the legal right to hold title to real property.

"Plat" shall mean the final subdivision plat for The Preserve at Clear Creek property recorded in the Office of the County Recorder of Yavapai County, Arizona.

"Property" or Subdivision" shall mean The Preserve at Clear Creek, as described on the plat recorded in the Office of the Yavapai County Recorder.

## ARTICLE II

### USES AND RESTRICTIONS

#### Section 2.01 Construction and Architectural Restrictions

- A. There may be erected on any one lot not more than one single-family residence plus such accessory and auxiliary garages, barns and tack rooms as are incidental to the single-family residential use. All structures erected or maintained on any lot or tract must be of new construction and no buildings or structures may be moved from any other location onto said lots or tracts.
- B. Only detached single-family dwellings containing a minimum livable area of One Thousand One Hundred (1,100) square feet may be erected on any lot. Guest quarters may be erected to be occupied solely by non-paying guests or servants. Any quarters for guests or servants shall be attached to the main residence. All construction for the guest quarters will be of the same type and materials as the main residence and comply with current County standards for guest quarters.
- C. The height of such dwelling may not exceed thirty-five (35) feet.
- D. Each single-family dwelling must have a minimum 2-car garage with a floor area of not less than Four Hundred (400) square feet.





B-4372 P-146  
Page: 3 of 11  
RES 3985485

- E. All dwellings must have standard architectural appearance and no non-conventional home may be constructed.
- F. The exterior of the main residence shall be of non-combustible limited flame spread material, with the exception of log homes, which shall be constructed with 8" diameter peeled logs, either round, swan or hewn. Other construction materials may consist of masonry or rock, redwood and/or cedar materials. Straw Bale type housing will have conventional appearance and follow architectural guidelines and combustible material standards. House colors must be earth-tone colors (i.e., browns, grays, soft greens, etc.). No bright or garish colors may be used.
- G. Roofing materials for the main residence, and any outbuildings shall be a class-A roof as defined by the Uniform Building Code, and shall be earth-tone colored metal, cooper metal roofing, concrete tile, fiberglass shingles, or clay tile. No reflective or white roofing materials shall be permitted. Corrugated metal roofing, composite asphalt, or rolled type asphalt roofing will not be permitted. Single-family residence shall have a minimum roof pitch of five feet (5') in twelve feet (12'), 5'/12'. All roof eaves shall be enclosed using non-combustible materials.
- H. Exterior decks and side enclosures shall be of a non-combustible limited flame spread material, and shall be constructed with 8' or larger structural beams or peeled logs, as described in the Uniform Building Code. Storage will not be allowed under the deck. Patio covers will be constructed using heavy timber or non-combustible materials (no light weight, easily ignited materials).
- I. No galvanized steel, press board, masonite, T-111 type plywood, corrugated or aluminum corrugated panels may be used for exterior construction of any type.
- J. Outbuildings may not exceed twenty (20) feet in height.
- K. A garage or similar structure may be erected on a lot prior to construction of the primary single-family residence; however, construction of the primary residence must be commenced within one year.
- L. All utility services such as electricity, telephone, water lines, gas lines, water storage tanks, or storage tanks of any other nature shall be installed underground in accordance with local county codes at the time of installation, and subject to the requirements of the supplying utility company.
- M. Septic systems on all lots shall be installed and maintained in accordance with the standards of the Yavapai County Health Department and the Arizona Department of Environmental Quality.
- N. All exterior construction of any buildings permitted hereunder must be completed within twelve (12) months from commencement thereof and conform to standard accepted construction practices. All materials must be new or approved by the Town of Camp Verde Building Inspector. All construction shall (i) be according to the rules and regulations governing construction in the Town of Camp Verde, (ii) be accomplished under a permit issued by the Town of Camp Verde, and (iii) be completed under



B-4372 P-146  
Page: 4 of 11  
RES 3985489

- the latest codes and requirements in effect in the Town of Camp Verde and Yavapai County at the time of construction.
- O. All building and structures within the Hinch Springs Estates subdivision shall be constructed within Fifty (50) feet from the front or rear of the house and Twenty-five (25) feet from either side and out buildings will comply to the setbacks as depicted on the final Plat. For the purpose of this covenant steps and unsupported eaves shall not be considered a part of any building or structure, but decks, patios, and support structures shall be considered a part of a structure or building.
  - P. Any fences erected on the property shall be constructed in a manner and fashion consistent with the character of the surrounding area. The fencing shall be installed in a neat and professional manner using new materials. All fencing shall be constructed of the following materials: galvanized pipe rail, pressure-treated doweled rail, wood rail, vertical wood slat privacy style, stone or masonry walls up to three feet in height, and pressure treated fence posts with field fence. The finished height of any fence shall not exceed six (6) feet if erected within fifty (50) feet of the property line, nor more than eight (8) feet otherwise. An exception exists for dog runs inconspicuously near buildings or homes. Perimeter Lot fencing must be consistent with existing perimeter fencing.
  - Q. None of the Lots shall be subdivided into smaller lots, and no portion of any of said Lots or any easement or other interest therein shall be conveyed, leased or otherwise disposed of without the prior written approval of the Declarant. The ownership of two or more adjacent Lots shall, with the written approval of the Declarant, be deemed to constitute a single Lot for the purposes of these restrictions.
  - R. No lot owner shall have the right to drill a well on its property without the expressed written consent of the Verde Lake Water Corporation for the subdivision.

#### Section 2.02 General Use Restrictions

- A. No boarders or renters of portion of any of said Lots shall be permitted, but an entire lot, together with the improvements thereon, may be rented only to a single family.
- B. No garage, trailer, mobile home, motor vehicle or any temporary structure of any nature may be used as a permanent residence on any lot or tract. Temporary use is permitted, in small trailers and motor homes, for short periods of time (visitors, family members, home construction). Such temporary use, however, will not exceed a continuous period of two weeks or four weeks in the aggregate during any one-year calendar year, except during home construction the time period may be extended to six months.
- C. No open fires or burning shall be permitted on any Lot and no incinerators or like equipment shall be placed, allowed or maintained upon any Lot. The foregoing shall not be deemed to preclude the use in customary





B-4372 P-146  
Page: 5 of 11  
RES 3985489



- fashion of outdoor barbeques or grills, unless such use is prevented or restricted by fire protection rules or regulations.
- D. All residences must be equipped with smoke detectors and a fire sprinkler system which shall be installed in conformance with NFPA standards as required by the subdivision ordinance of the Town of Camp Verde. All exterior building construction materials shall be of limited combustibility. All lot owners shall establish and maintain a defensible space around each structure constructed on a lot. All fireplace chimneys and outlets from stoves, heating appliances and outside fireboxes must be protected from flying sparks by the use of approved spark arrestors. All other fire management issues shall be under the control of the Declarant.
- E. Due to the possibility of fire, each of the Owners of said Lots shall at all times maintain his entire Lot cleared of hazardous growth, vegetation, dead wood, and other flammable or host materials. Additionally:
- i) All buildings upon said Lots shall have not less than two garden hose outlets with adequate hoses so as to permit a stream of water to be directed at all sides and the roof of said building and all trees and other structures upon such Lot.
  - ii) Each Owner shall own and maintain a sufficient number of fire extinguishers to adequately protect the improvements upon the Lot.
  - iii) No Owner shall maintain any flammable materials or otherwise use his Lot in a manner which would create a fire danger to any of said Lots;
  - iv) Each Owner shall be bound by all fire protection rules and regulations issued by the Declarant;
  - v) Outdoor storage of firewood, kindling or compost material must be stored at least 30' from any structure, unless the material is stored in an approved bin or enclosure. No LPG tanks will be maintained within 30' of any structure.
- F. No motor-driven vehicles of any kind shall make use of any easements or areas set aside for pedestrian use.
- G. No hotel, store, multi-family dwelling, boarding house, guest ranch or any other place of business of any kind, and no hospital, sanitarium or other place for the care or treatment of the sick or disabled, physically or mentally; nor any facility for care or treatment for compensation of sick or disabled animals shall ever be erected or permitted upon any lot, or any part thereof, and no business of any kind or character whatsoever shall be conducted in or from any residence or building on any of said lots or tracts, except for a home office or other activity that can be operated within a residence and without disturbing neighboring properties.
- H. Addresses for all residences will be at least 4" in height and will be in front of and affixed to the structure itself, per fire department specifications. All numbers will be clearly visible from the street, and each number will be on a contrasting background.