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City of Grimes Newsletter Special water update edition.

History

Back in 1996 the City of Grimes updated its Water Facility Plan when the special census showed that the population had grown from 2600 to 4177 in a little over 4 years. The Water Facility Plan showed that the old water plant consisting of one Jordan well located on E 1st Street would not be able to keep up with demand.

At that time the option to connect to Des Moines Water, or search for alternate water sources, was explored in depth. The end result was that it would save the Grimes citizens about 8 cents per thousand gallons to connect to Des Moines Water. The City Council at the time weighed their options and decided that keeping an independent water supply was well worth the minor cost difference.

The City drilled several test wells and determined that the Shallow wells located on the Reichenbach property was a viable water source with much better quality than the water coming from the Jordan Well. The plans for the new water plant, located near the current site of the waste water plant, were underway. It was also determined at the same time that the waste water plant would not keep up with demand.

To finance the new water plant and the expansion to the waste water plant, the City was able to take out State Revolving Loan Funds which typically have lower interest rates than normal loans. In order to pay off the loans, rates that hadn't been increased in over 20 years were increased to the rate that is in place today.

Of course the out-lash was intense and several special meetings were held to answer questions and explain why the increase was needed for the improvements.

An independent special committee was also formed who reviewed the entire process and determined that the city had followed all of the legal steps needed to increase the rates.

The Council has promised that the rates would be evaluated at regular intervals to determine if they could be decreased.

Rates have been evaluated and any reserves have been reinvested back into the system without needing to raise rates. The new Jordan Well was also financed through SRF but an increase in rates was not required.

So what happened?

In 2000 the new plant started pumping water and the citizens of Grimes were pleased with this new water source. The discolored water that smelled of heavy minerals was no longer coming out of their faucets.

This new water source was not as hard and most people shut off their water softeners.

These new wells were about 40-60 feet below the surface as compared to 1800+ feet. These shallow wells were deep enough that they weren't considered under the influence of surface water, but shallow enough that when the first drought hit in 2012 the levels in the Shallow wells that usually fluctuated no longer increased at all. City leaders and engineers watched the levels closely and determined that a mitigation plan needed to be put into place to decrease the demand on the wells. It was also determined that the city needed an alternate water source.

Water sources

Because of the droughts in both 2012 and 2013 the City aggressively sought alternative water supplies. Plans were made to construct a new Jordan well, that although not ideal, it is a more consistent water source. The old water plant was brought back on line to supplement the supply and negotiations started with Xenia and Des Moines Water (Xenia purchases water from DMWW) to establish an emergency connection with them. All of these are in place today.

Why didn't you know the Shallow wells would be affected by the drought?

It is still unknown as to why our well levels dropped. Granger and the golf course are both using the same water formation but they do not have any concerns. There is a theory that there is a high spot in the formation and once the water level dropped to a certain level, the water wasn't flowing over this high spot to our wells any longer. (like a dam) We have hired hydrogeologists who are researching this and drilling test wells so we know what our long term options are.

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Why were we asked to cut back on our water usage this last summer of 2014? Several things happened this last summer. First of all while drilling the new Jordan Well, the drill bit broke about 1300+ feet below ground. After several attempts and \$1M of the contractor's money, the well was abandoned. A new well was drilled a few feet away. In addition the pump could not be ordered until the well was completed and the amount of water that can be pumped from the well was determined so the pump could be sized correctly. These things delayed the Jordan coming online. Secondly, the new water plant cannot pump enough water to supply the city during the hot months when the water usage is at its highest. We had used the old plant to supplement some as well as the Xenia connection but neither water sources are for long term usage. As a result, we asked you to conserve water at least at the initial level which meant that you were being more conscientious about how you were using your water and cutting back if

What is the plan since the new water plant can't pump enough water for our highest usage days?

The water facility plan indicates that the expansion of the water plant would need to be under construction now or we build an ASR; aquifer storage recovery well, to store water that our plant produces during low usage times so it can be pumped into the system during the high usage days. The decision was made to convert our old water plant, and old Jordan well into an ASR. It couldn't be constructed until after last summer because that well was still needed as a backup. The construction of the ASR delays the need for an expansion of the new plant and makes more efficient use of our existing resources. It also delays the potential that the water rates will need to increase to pay for the new plant expansion.

What exactly is an ASR?

An ASR is an aquifer storage recovery well. The use of our old Jordan well was perfect for this relatively new "technology." There are only about 5 of them in the state of Iowa. Water is pumped into the ground. As it enters the existing well and water, it pushes out the existing water and creates a flume of new water. Millions of gallons are pumped into the ASR during off peak times, typically winter months, when water usage is down. This is better for the existing plant as it can be operated and maintained at a consistent level. In the summer months when the demand is the highest, both the water plant and the ASR will be pumping water into the distribution system. The water pumped out of the ASR is tested and treated as necessary before entering the system. The goal is to pump all of the extra water that will be needed in the summer during the winter months thus delaying the need for an expansion at the plant at this time.

When will the new plant be expanded?

If everything works as planned, the new plant may be under construction as early as 2020 or as late as 2024. Much of it depends on growth and what the recovery from the ASR is.

Why do you continue to allow houses to be constructed?

Well first of all the City of Grimes does not offer any residential tax abatement, TIF, or any other incentives to promote residential development. As long as there is developable land and the owner of the land meets the zoning requirements, the Council is legally bound to approve the plats. The City also has a legal duty to provide water, sewer and streets to drive on. It is up to the City to make sure the water supply is keeping up with the growth.

Tell me more about what is happening with the Shallow Wells

The City has contracted with LBG who are experts in the field of water formations. To date, there is not enough information to explain why other users of our same water formation are not experiencing the same low water levels at their wells. LBG are expert hydrogeologists who have identified locations to install test wells to collect data. That data will help them better map the underground formation and determine the long term viability of the shallow formation. That testing is going on right now. The data will be compiled and then a report will be presented to the City Council on their findings.

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What if the hydrogeologists determine that the Shallow wells cannot sustain us?

At that point the City Council will need to decide if they want to drill another Jordan well and convert the current water plant to a plant that specializes in treating Jordan water or if they want to use more water from Xenia and Des Moines Water. The Council could also decide to go solely with Des Moines Water to supply the entire City. About 5 years ago Xenia wanted to purchase and run the plants for the City of Grimes. The Council opted not to pursue that option. The investment going forward has to be weighed in with the investment that is already in place. In other words the city invested almost \$6M into the new plant so making the best use of our existing resources has to be considered as well as the costs to convert to another system.

Why didn't our experts and engineers see this coming?

As was explained earlier, it was not anticipated nor can it be explained why the levels in the Shallow wells dropped and then didn't recover as anticipated. For 12 years the plant and the system worked great. Of course the drought was severe but that doesn't explain why the other users did not experience the same thing.

Jordan well water

The Jordan well is almost 2000 feet below the surface of the ground. The temperature of the water is almost 70 degrees coming up out of the ground. The water is running through rock formations full of minerals and sediment. It is higher in natural fluoride, magnesium, ammonia and sulfate. You may have experienced a different smell and a slight discoloration in the fall months when the city was just using water from the Jordan well. Although it is perfectly safe to drink, it has a different taste and odor than the water coming from the Shallow wells.

Shallow well water

The water coming from the Shallow wells is about 40-60 feet below the surface. It lies in more of a sand/rock formation and does not consist of the same mineral content as the Jordan Well. When the water was first being pumped from the Shallow wells its hardness level was much less than that experienced over the last several years.

What is the long term viability of the Jordan Wells?

This question seems to haunt the experts. The levels in the Jordan Wells are decreasing as well. Some towns with very high users are being asked to cut back. Google Iowa's Jordan Aquifer – IDNR and you can read all about the concerns about the water systems. This will be another factor in determining our long term options depending on the results on the formation of the Shallow wells.

What about connecting to Des Moines Water Works?

This option will most definitely be considered once the results from the hydrogeologists come back from the Shallow Wells. Des Moines Water would be water that is treated and purchased from DMWW and their plants. They have surface water plants which also have their fair share of challenges. DMWW was under a water mitigation plan because of their high algae levels in the river which meant their plants had to slow down to effectively treat the water. They are also in litigation with a few counties because of the high nitrate levels flowing into the water ways feeding their sources. All that being said, other than the Flood of 1993 when Grimes was supplying water to the rest of the metro, DMWW has been a consistent supplier of quality water. For the Council it was a matter of maintaining independence and controlling our economic destiny. DMWW is run by a board that makes decisions for their entire service area. Cities on DMWW purchase a certain amount of capacity and pay their portion for the infrastructure and have limited control over the costs and the rates.

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What about the hardness of the water?

As noted above the hardness in the Shallow wells had increased although it has leveled off some. Over the past year the hardness has ranged from a low of 202 to a high of 257. Note you divide this number by 17.1 to get the grains of hardness. The hardness in the Jordan Well was consistent at 215 and 216. Over the years many people who had shut off their softeners when the new plant came on line have restarted their softeners or purchased softening systems.

Why is the current water so hard?

Because of the high ammonia levels in the Jordan well, the Shallow well water is being blended with the Jordan well. This blending of water has increased the water hardness from 216 to 375 and 334 over the last few months. People without water softeners have noticed a higher residue on their dishes and appliances.

Why can't the plant decrease the hardness in our current water?

The new water plant was constructed with a lime-softening system to treat the chemical composition of the Shallow well water. Because the composition of the Jordan water is different the current system isn't as effective in decreasing the hardness levels. Blending both sources compounds the problem because adjustments cannot be made one way or the other specific to one chemical composition over the other. Both USW and FOX Engineering have enlisted their top experts to evaluate the current systems and determine what feasibly can be done to adjust the hardness in the water.

What if there isn't anything that can be done with the current process to improve the hardness in the water?

The City Council will review all of their options and determine how to best move forward. More to come on this question.....

Helpful hints for dealing with hard water.

First of all the experts are trying to determine why some locations are experiencing more apparent effects of the hard water than others. Since the water has been considered hard for the last several years some of the challenges could be the result of build up over the last several years versus a short term problem for households that do not have water softeners.

1. Use less soap. Soap is less likely to dissolve in harder water so avoid soap buildup and use less. Soap buildup can be just as damaging to your appliances as hard water residue.
2. Use a rinse agent or vinegar in your dishwasher.
3. To truly tell what is happening in your dishwasher, take a clean glass, rinse it off and let it dry. Look at the spots. If they are lighter than those coming from your dishwasher you can then determine if you have too much soap or if your dishwasher rinse wand may be clogged and not rinsing your dishes effectively.
4. Install a water softener.

The future

Until more information is gathered it is not known what the future will be. There is a water facility plan but that is a living and breathing document as the existing resources change. As a city we always need to be looking at better and more efficient ways of using an endangered resource. There are cities that have to re-treat their waste water and convert it to drinking water and other cities that pipe raw water 60 miles to have clean water. It is not an unlimited resource. All that being said, there is a City Council and administration committed to keeping an open mind and determining the best options for moving forward with this invaluable resource.