John M. Stomp III, P.E. is a registered professional engineer in New Mexico and has been the Water Resources Manager for the City and now the Albuquerque Bernalillo County Water Utility Authority for more than nine years. John was born and raised in New Mexico and has bachelor’s and master’s degrees in civil engineering from UNM. As the Water Resources Manager, he is responsible for water conservation, water reuse and reclamation, and implementation of the Drinking Water Project. He is also responsible for compliance issues related to the new drinking water standard for arsenic including the construction of a new arsenic treatment facility on Albuquerque’s westside. John has more than 18 years of experience dealing with water and wastewater issues in New Mexico and throughout the southwestern U.S.

ALBUQUERQUE’S DRINKING WATER PROJECT

John M. Stomp III
Water Resources Division, Albuquerque-Bernalillo County Water Utility Authority
PO Box 1293
Albuquerque, NM 87103

Thank you very much. First, I would like to thank the Water Resources Research Institute, Karl, Bobby, Cathy, and all of the people involved behind the scenes that make this conference possible. I also want to thank them personally for allowing me the opportunity to present a status report on where we are with the Drinking Water Project. I know for many years I have been talking about when we get to the construction, when we get here, and when we get there. It has been a long road. My job today is to talk about where we are. Hopefully you will learn a little bit and see some interesting construction slides. No matter what hill we get over, there always seems to be another hill to climb. I am going to talk about what I think is going to be a challenge for us at the end of this project. At the beginning of this project, we would have been thankful to be there. Now we are here, and it is going to be a lot of fun and a big challenge. I will present photos of the facilities themselves, talk about the public acceptance plan, which I think is one of our biggest challenges, and I will talk about some of the problems that Tucson had when they brought their surface water plant online, and some of the things we are going to try to do to educate and get our public ready for it.

Figure 1 is a large picture of the drinking water project. The cost is $375 million, which is being financed by our rate payers and solely by our rate payers through seven dedicated water rate increases that started back in 1998 and just ended in 2004. The water treatment plant is capable of treating 100 million...
gallons a day, 120 million expandable in the future. We have a diversion dam on the river. There are about 50 miles of large diameter pipelines. If you have been to Albuquerque, certainly you have run into the construction of one of the pipelines, whether it is laying on the side of the road or maybe you have been to San Pedro or the west side.

When we started out this project we had huge environmental issues associated with diverting the water out of the river. We still have those issues, but when we came down to the actual construction of the project, it was the pipelines that the neighborhoods and the people really put their arms up in the air about. They said, “Hey! You are putting a 54-, 60-, 72-inch diameter pipe in front of my house. How is that going to work?” It has been an interesting challenge to try to educate them, but also to get them prepared for what the construction will be like.

For those of you who went on the tour yesterday, the diversion dam located just south of Alameda Bridge is operational. It has been completed since April 2006. We have a couple of minor additions and changes that we are going to be making to the facility in Fall 2006. In January, we are going to start a pilot program to operate the facility. Figure 2 shows the actual diversion dam during construction in the river in two different phases, in two different wintertimes. We built the west side in one wintertime, and we came back the next winter and built the east half of it.
Figure 3 is a picture of what the bladder dam looks like in the river. The dam spans 660 feet across the river, but it is built in 21 different sections. The whole point of that is to be able to (1) let the sediment through the dam, which is going to be a tremendous challenge, and (2) to protect fish species and allow fish to move freely up and down the river at the same time that we are diverting our water. This slide shows a depiction of the dam, the steel plate structure. It has supports, and then there are two bags behind the dam that are about an inch thick of rubber and reinforced steel that have air tubes to them that raise and lower the dam. You can raise or lower the dam sections all at one time or individually, like a piano.

As we finished the west side and the testing of the facility, we raised the dam when there was sedimentation that occurred over the wintertime period. As you can see in Figure 3, the little island in the middle was connected before we ran this test, but it was torn apart. The whole purpose of this test was to see if sedimentation would fill up over the top of the dam, whether the air bags would be able to lift the dam with sediment on it. We raised the dam, and the island was removed. It was a very promising thing to see, not to see that the sediment would pass beyond the dam but to see that we could operate the dam in a way that would free up and move sediment.

Figure 4 is the picture of the intake structure. It is about 15 or 20 feet high, and inside of that intake structure there is a trash rack in front. Those little concrete pillars are Iowa vanes that we are using to push sediment away from the dam. The intake structure takes water in as the dam is raised. We got a really good picture of what is going to happen this summer. Everyone here is aware of the huge rain storms we had, but we had a tremendous amount of sediment wash through the section. If you were out there yesterday, you could see that those Iowa veins that are about three feet high are all filled with sediment. It did help and assist to move sediment away from the intake structure.

Figure 5 shows two intake structures. One is capable of taking the water that we need. We have two so that if we have a problem with one, such as needing to clean the sediment out, we can move to the other one. Again, we have the dam section there that shows
you what it looks like looking on top of the grated structure.

One of the biggest challenges that we have obviously is sediment. If you have been out on the river and have seen the dam, there is a tremendous amount of sediment accumulation. You may have been lucky enough to see Middle Rio Grande Conservancy District (MRGCD) facilities over the years dealing with the sediment issues that they have. Operating this facility and making sure we can move the sediment is going to be the biggest operational challenge.

Figure 6 is what I talked about with respect to the pipelines. We have about 50 miles of pipelines. Each one of these had its own little challenges. The bottom right hand corner depicts the area where we had to cross the river. This drinking water project is going to allow us to integrate our water system on the east side of the river with our water system on the west side of the river. They used to be independent, separate systems. Now we can move groundwater or surface water from the east side of the river to the west side. The photo on the right shows the area that we crossed the river. Campbell Road is in the background. There are two 54-inch diameter pipelines that go underneath the river at 25 feet deep. They are concrete encased structures, and that kind of just gives you a picture of some of the impacts of the project. Some people were very upset when we cut this swath through the bosque. It is about 100 feet wide. You can see the impact right there on the left photo. That swath is something that you are going to see for a very long period of time, because we have cut out plants and trees, and we have only planted grasses and other plants on top of our pipelines, but no new trees. People will remember when John Stomp cut those trees out of the river valley. That is one of my legacies that I will have to deal with forever.

Figure 7 shows the valve vaults where the two 54-inch lines come back together. We built two 54-inch pipes across the river so that if we ever had a leak or a problem with one we could switch back to the other one and still get water across the river. This shows where the two 54-inch lines come to a very large valve head that is the size of most homes here in town. It is about 1,500 square feet, and it shows how the two 54-inch lines come back together into one line.

Figure 7. Rio Grande crossing, bottom of the west bluff 54-inch connection

Figure 8 is a picture of the raw water pipeline being installed. This is a 72-inch steel pipeline with concrete on the outside of it for corrosion protection along the Paseo del Norte. We used as many of the existing right of ways as we could to install the transmission lines so that we did not have to tear up roads. We are on the north side of Paseo del Norte. The MRGCD provided a significant amount of land for us to place our pipelines so that we could avoid tearing up existing roads. Obviously you can see the tremendous impacts. This pipeline is six feet in diameter. That trench is 22 feet deep. You can imagine the scale of that with the excavator on top setting that pipe. It was a tremendous challenge to construct the pipeline in the sandy materials and the soil conditions that we had. Again, Figure 9 is just a different picture of the trench box that is coming from the pipeline at Rio Grande Boulevard.
We tunnel under Rio Grande Boulevard and hit a fiber optic cable. The contractor stopped and pulled the tunneling head out of the machine when sand started falling into our trench. We almost lost the roadway at Rio Grande just north of Paseo. Luckily we were able to save that, but we ended up having to rebuild the roadway. Those are some of the tremendous challenges that we face every single day when we are out there building this project. There was some tremendous excavation required to build these pipelines (Fig. 10).

Figure 10. Excavation along Paseo del Norte

Figure 11 is another photo of the support that is necessary for these pipelines. This is a bridge support structure for a new drop manhole as we bring the water into the water treatment plant. Figure 12 is one of the bore pits. In a lot of the tunnels in these transmission pipelines, we tunnel under a significant amount of roadway. For those of you that live in Albuquerque, we are on Phoenix right now just east of San Pedro. There is a 1,100 foot tunnel that we are building. It is 30 feet deep underneath the roadway. We are pushing a new transmission line underneath 30 feet deep next to these homes. It is a tremendous operation. You cannot really get a sense of that from a picture like this, but the reality is that the tunneling operation is very dangerous and kind of interesting if you are an engineer. At the same time, you have problems with these things and they sometimes collapse. Figure 13 is some more pipeline construction.

Figure 13. Raw water pipeline (72 inch) - looking west along Paseo del Norte
Figure 11. Raw water pipeline #2 72-inch RCP, pipe cradle support for raw water drop manhole

Figure 12. Bore pit at the south side of Carmony and Edith Blvd

Figure 13. Raw water pipeline #1 delivering carrier pipe to east side of 2nd Street bore

gallons a day. This pump station is about 35 feet tall from the surface. It is about 60 feet deep and 70 feet wide. It is a 105 feet long building. This massive pump station is located in an open space. We have worked with the neighborhoods to try to figure out what it should look like. We presented four or five different architectural choices. The neighborhood association chose this to look like an old Spanish style church. When we are done, this big pump station is going to look like an old church, sitting in an area where there used to be a church on that same property about 100 years ago. Obviously this is going to be significantly larger than that. The idea was that we try to build these facilities on local land so that we do not have to buy a lot of land. There were significant neighborhood concerns along with that.

Figure 14 is the raw water pump station that is being built just south of Alameda. This is the pump station that is going to be taking the water from the diversion facility up to the water treatment plant. This pump station has about the same capacity of all of our 96 wells combined. It can pump about 120 million

Figure 14. Raw water pump station wet well slab, rebar setting preparations
We broke ground on the water treatment plant in August 2004. We had about six months’ worth of dirt work that we had to do. We moved about 1.5 million yards of dirt at the water treatment plant, converting an old gravel pit site into the water treatment plant. That was finished in about March 2005, then we started the full construction of the water treatment plant, with the goal of bringing the plant online in July 2008.

Figure 15 shows some of the facilities that are already constructed. That is the administration building, just a small picture inside. The administration building is one of the projects that we phased into the water treatment plant so that we could occupy portions of the water treatment plant site prior to 2008. We hope to locate all of our central control for all of our water facilities at this building in October 2006. All of our reservoirs, pump stations, the new diversion facilities, all of our drinking water projects, and our existing facilities will be operated at this new administration building. Then you can see the big 200 feet tall tower. By the way, if you drive north on Interstate 25, you can see the construction of the water treatment plant.

Figure 16 shows an overview of the site. This was taken several months ago. You can see the rain water from the storms that we had. The two tanks on the left are 10 million gallon storage tanks. That is where the finished water from the water plant will be stored. The other basins to the north are where the two 50 million gallons of storage are located, for a total of 100 million gallons of storage at the plant. The plant has changed a lot since March 2005. We have spent about $100 million on the plant so far.

Figure 17 is a picture of the chemical building. All of the chemicals for this site will be located in a central location. There is one place where all of the chemical deliveries will be taking place. This is one of those results of September 11 that a lot of people do not talk about. We will not be able to give any tours of the facility. We will be showing people these facilities from the administration building, because EPA and the National Security Council will not allow you to take people on tours of these facilities. This is probably the best that you are ever going to see of the water treatment plant. All of the chemicals are housed in one building now, where chemicals are delivered on site. We have complete access and control of where those people are going, and they should only be in one area of the site.
Figure 18 shows some aerial views of the tanks themselves. It is very hard to appreciate the massive construction at the water treatment plant. If you were on the tour yesterday, you were able to kind of see that. Those two tanks themselves are 60 feet high and 400 feet in diameter. To stand there and look over it is pretty awesome.

That reminds me of the story of the cement shortage and the steel prices recently. This project used to be a 275 million dollar project, and it went to a 375 million dollar project in the course of about four months, a result of China buying all of the steel and the cement issue that occurred recently. All who are in construction know that there are shortages of cement coming from Mexico. We are pouring 90,000 cubic yards of concrete at the water treatment plant, so you can see a 10, 20, or 30 dollar premium on a cubic yard of concrete makes a huge difference. The drinking water project requires 30,000 tons of steel. On the market, the raw quantity of that is about 30 million dollars.

Figure 19 is the settled water pump station at the water treatment plant. All the water will be lifted up through this pump station and gravity fed all the way through the rest of the process.

It is hard to show the magnitude of this project. One of the biggest challenges we have left is the public acceptance plan, and that is getting people in Albuquerque and the metropolitan area to be prepared for drinking surface water in 2008. We brought in Tucson so they could tell us the story of how not to do it.

For those of you who are not familiar with the Tucson story: Tucson brought in their Central Arizona Project water from about 200 miles away, and they did not look at the chemical compatibility of the surface water with the groundwater. They mixed the two and in fact turned over half of the entire city in one night to surface water. In downtown Tucson, they had a lot of red water quality complaints, which they ignored for the most part. It happened to be right in the middle of the city council election. They had red water coming out of the faucets, leaks because a lot of the pipes in the old downtown system had calcium carbonate deposits. There were a tremendous amount of leaks, and that led to a referendum in Tucson which was approved about two years ago. Seventy-eight percent of the people voted that they would never drink surface water. They built a 100 million dollar plant that sits idle today. They are slowly but surely trying to build up their confidence with the consumers there and hopefully get the bad idea of surface water taken care of.

We obviously do not want to be doing the same thing, but yet we face the same sort of issue. The reality of it is that, once the surface water is online, our people could have four different qualities of water in a year. They could have fully surface water, a blend of groundwater and surface water, fully groundwater, and a different blend of groundwater and surface water, then back to surface water again. All of that could take place in a single year. So, we have a tremendous amount of education that we need to take care of prior to this to get people ready for that.
One of the things that we have done, and if you have been along Alameda Bridge there is a little trailer just south of there, is a pilot water treatment plant to test the water treatment process we are using at the plant. We will also be generating about 5 gallons a minute out there. We are going to be bottling the water all in an effort to get people ready for distributing this water to our customers in advance. We are also going to be working with our neighborhood associations to take tanks of that water and isolate specific neighborhoods throughout town and start feeding them the surface water next year so that we can look at the chemical compatibility issues in individual neighborhoods over the course of the next year or so. We will probably be hooking up one neighborhood every month or so, running that for a month, stopping it, going and isolating a different neighborhood and so on. All of this is an effort to look at the big picture, get people ready, and be able to understand how the surface water is going to interact with our existing system.

In bringing the surface water plant online in 2008, we are probably going to follow the Tucson example again on what not to do. We will probably end up bringing the plant online and serving it to one trunk or zone in Albuquerque for a few months, then moving to a different trunk and zone, and so on over time. The implementation process will probably take about a year. It is a tremendous challenge, and Tucson failed at that challenge. We are very glad that they did. I am sure they do not want to hear that, but we are very glad that they did so that we can avoid making the same mistakes they did.

Question: I have been trying to figure out where the plant is. Did you buy property from Vulcan, so that you basically have your own concrete making facility where you are putting in the plant?

John: We purchased 160 acres from Vulcan. Vulcan is leasing 70 acres of the property back from us, primarily so that they can finish mining the site. There were still gravel deposits that we did not want to buy mineral rights for when we bought the site. They are actively mining the site, and they are running their batch plants both there. We do not get free concrete from Vulcan if that is what you are thinking.

Question: I have to applaud you and your crew, because I think you are doing a huge project very quickly. Now with the new pipes that you are putting in, are the 96 different wells we have around the city going to be interconnected to those pipes?

John: The new pipes themselves were quite a challenge. It was not just bringing the surface water and moving that surface water to our existing reservoirs. On the east side of Albuquerque, we are going to use those large transmission lines to take groundwater from those reservoirs back to the water treatment plant to the west side so that we can meet our arsenic requirements on the west side. We do not just get the water out of the treatment plant and get it to our reservoirs. We now are moving water from our reservoirs across the river to the west side, so it was quite a challenge. We are trying to bring that online sooner than the water treatment plant comes online. We are hoping to do that sometime in late 2007 to test moving east side groundwater to the west side. Nobody will be allowed to connect onto those lines. Those will be separate transmission lines. There will not be any service connections, no extensions. They are solely for the drinking water project.

Question: With this project, will job opportunities increase? Will there be a need for more water operators for instance? Or will there be a decrease?

John: That was one of the things that Tucson told us they did right. They brought the staffing that they needed on in advance so that they could train their staff to be ready to bring the plant online when they said they would. They did. They brought the water plant online, but they just did not think about how they should do it. That is one of the things that we are working on right now. There will be a total of 20 new people for the water utility to run the drinking water project. As you can imagine, right now we pump water from the ground, we chlorinate it, sometimes we fluorinate it, and that is it. Now we are moving to a very complicated process where we are ozonating the water; we have granular activated carbon filtration. It is a whole totally new process. We have got to train our operators to do that. We are going to bring our staff online to be able to do that in advance.