STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION

In the Matter of:	)	
PROPOSED AMENDMENT	)	**No. WQCC 12-09 (R)**
TO 20.6.6 NMAC (Dairy Rule)	)	

DIRECT TESTIMONY OF LONNIE BURKE

My name is Lonnie Ray Burke. My residence and business address is 2981 Beach Road NW, Albuquerque, New Mexico. I hold a B.A. degree in social science and drama from New Mexico Highlands University from which I graduated in 1971. I also hold a New Mexico Journeyman Plumbing and Gas Certificate.

I currently own and operate a business known as Resource Wise that is located at the same address. I started Resource Wise about ten years ago. Resource Wise does contract consulting for water and wastewater systems. For example, I hold a contract to help the City of Rio Rancho's water conservation program and have helped with their cross-connection program, including inspection of backflow prevention devices. I also work for several small water and wastewater utilities. For eight years, from approximately 1992 through 2000, I was employed by Presbyterian Health Services as a plumber. In that capacity, I was responsible for installing and testing backflow prevention devices. Before I took that job I sold a plumbing business I had operated for about eight years that had about eight employees.

I currently am an instructor at Santa Fe Community College for a course in water conservation auditing. I started teaching that course this semester. For three years before I started Resource Wise, or approximately 2000-2003, I was the Head of the Plumbing Department and instructed in plumbing at Albuquerque Technical Vocational Institute, or TVI,

now known as Central New Mexico Community College. Among other things, I taught courses in backflow prevention and cross connections.

I am experienced in landscape irrigation systems and hold a certification for teaching (QWEL) Qualified Water-Efficient Landscaper program. I also am familiar with the characteristics and operation of agricultural irrigation wells. I do not, however, have direct experience in the design, installation or operation of systems for land application of wastewater from dairies.

I have been asked by the Dairy Industry Group for a Clean Environment to provide this testimony regarding the backflow prevention devices specified in the dairy rules, particularly reduced pressure principle devices. Based on my experience and credentials in the plumbing field, my experience with and understanding of reduced pressure principle devices, and the specifications for the use of reduced pressure principle devices in the Uniform Plumbing Code, I do not believe that reduced pressure principle devices are suitable or appropriate for use as backflow prevention devices for irrigation wells connected to dairy wastewater systems used for land application of dairy effluent.

For purposes of this testimony, I have reviewed the proposed amendments to subsection M of section 20.6.6.21 NMAC, attached as *Exhibit Burke-1*. My understanding is that this subsection currently allows for only two types of backflow prevention devices for use at dairies that apply wastewater to fields, the air gap method and reduced pressure principle devices. I understand that another witness more familiar with agricultural irrigation systems will address the limitations on the use of air gaps within the dairy industry. I also understand that the amendments proposed by DIGCE would replace reduced pressure principle backflow prevention assembly devices with a device described as an "air/vacuum relief valve and a low pressure

drainage value located immediately upstream of a check valve." I understand that this type of device is referred to in the agricultural industry as a chemigation valve. I am not familiar with chemigation valves, but my testimony addresses why reduced pressure principle backflow assemblies should not be used in a dairy land application setting.

I have recommended, tested and installed reduced pressure principle backflow assemblies in my plumbing work and have given instruction on these devices. A reduced pressure principle backflow assembly (RP) consists of two internally loaded independently operating check valves and a mechanically independent, hydraulically dependent relief valve located between the check valves. This relief valve is designed to discharge if the pressure in the relief valve is equal to or greater than the upstream pressure entering the RP. The RP also contains tightly closing, resilient seated shut-off valves upstream and downstream of the check valves along with resilient seated test cocks. This assembly is used for the protection of the potable water supply from either pollutants or contaminants and may be used to protect against either backsiphonage or backpressure. At the live hearing in this case, I will demonstrate to the Commission how an RP device operates, using a cutaway exhibit of an RP assembly that I have used in my instructional work. A breakdown of a RP is attached to my testimony as *Exhibit Burke-2*. One can see the complexity (by the breakdown attached) of a RP, and see why the repair and testing requires a forty hour class.

Attached as *Exhibit Burke-3* to my testimony is a copy of Chapter 6 of the Uniform Plumbing Code, 2003 version, which I understand was introduced as an exhibit in a previous hearing on the dairy rules. Under the Uniform Plumbing Code, RP devices are used to protect potable water supplies, but they are not supposed to be used for sewer systems or wastewater lines, or for cross-connections between wastewater systems and potable water systems.

There are several reasons why RP devices are not specified for use in wastewater applications, and why I do not believe they are appropriate for use for dairy wastewater land application systems and for agricultural irrigation systems in general. First, RP devices are readily susceptible to fouling by sand, gravel and grit. Agricultural irrigation wells commonly pump sand and gravel that would flow through an RP device used at an irrigation well. As I will show using the cutaway, sand or gravel would lodge in the number 1 check valve of an RP device, the relief valve would dump until the RP was repaired, which would render the RP device inoperable which would require repairing and testing by a certified backflow technician. This likely would happen frequently if an RP device is attached to an irrigation well. An RP requires annual testing by a certified backflow technician, and must be retested any time it is repaired.

Second, RP devices become inoperable in freezing weather conditions and typically require active heating to prevent freeze-up. Consequently, they would not be suitable for use outdoors on agricultural irrigation systems in freezing conditions.

Also, a condition known as a "water hammer" may occur in irrigation systems, particularly those employing center pivot sprinklers. Water Hammer could damage the number 2 check valve of an RP device, rendering it inoperable once again requiring repair and testing.

RP devices are designed for use in systems that are under consistent and continuous water pressure. Irrigation wells do not operate under consistent pressure, but typically have intermittent or variable pressure. Inconsistent or intermittent water pressure will cause an RP device to constantly cycle, resulting in more frequent failure of an RP device used under those conditions.

Finally, RP devices are relatively complex, can be difficult to drain, and require specialized training to repair and test. In my experience, particularly in auditing water systems, I often encounter RP devices that have not been properly inspected and maintained. I have doubts about whether RP devices used in an agricultural setting would receive the necessary testing and maintenance to remain operable. Given all of these factors, I recommend against the use of RP devices for agricultural irrigation systems in general or for irrigation systems used for land application of dairy wastewater.

Based on this testimony, I recommend that the dairy rule provision on backflow devices, 20.6.6.21.M, be amended such that RP devices are not specified for use at dairies conducting land application of wastewater. If certain irrigation systems need an alternative to an air gap as backflow prevention, then an alternative other than an RP device should be specified.

I will stand for questions on this testimony at the hearing scheduled for December 11, 2012.

Respectfully Submitted,

Lonnie R. Burke

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