STATE OF NEW MEXICO
BEFORE THE WATER QUALITY CONTROL COMMISSION

In the Matter of:	)	
PROPOSED AMENDMENT	)	**No. WQCC 13-08 (R)**
TO 20.6.6 NMAC (Dairy Rule)	)	

DIRECT TESTIMONY OF LONEY ASHCRAFT

My name is Loney Ashcraft. My residence address is #1 La Placita, Roswell, New Mexico. I hold a B.S. degree in Agricultural Economics/Agriculture Business from New Mexico State University from which I graduated in 1969.

I currently own and operate a business known as Ashcraft Consulting that is located at the same address as my residence. Through that business I provide dairy consulting services, which I have done for ten years. Before starting Ashcraft Consulting, I was employed for 36 years with the U.S. Department of Agriculture Soil Conservation Service, now known as the Natural Resource Conservation Service (NRCS), with 30 years as District Conservationist.

I hold the following certifications relating to my work as a dairy consultant: New Mexico Comprehensive Nutrient Management Plan ("CNMP") and Certified Crop Advisor (CCA). I also have completed the following courses of training provided by the NRCS: Water Quality (November 1, 1998); Agricultural Waste Systems II (April 27, 2001); Nutrient/Pest Management in Conservation Planning (April 24, 2002); Nutrient and Pest Management Online (December 3, 2001); and CNMP Planning (September 21, 2001).

In my positions as a dairy consultant and with the NRCS, I have worked with dairy operations for over 35 years in planning and designing wastewater storage systems and manure management. During this time I also have designed and constructed several types of irrigation

systems, including center pivot, side roll and linear sprinkler systems, gravity or surface flow systems, and drip systems. Several of these systems are used for land application of dairy wastewater. I have prepared numerous farm and ranch resource conservation plans, ranch plans for ranches of sizes up to approximately 60,000 acres, and farm plans for various size farms up to approximately 3,500 acres. I am experienced with both range management and cropland management. I have prepared numerous applications for dairy discharge permits.

I am providing this testimony on behalf of the Dairy Industry Group for a Clean Environment, Inc. (DIGCE) to provide this testimony in support of certain of DIGCE's proposed amendments to the Water Quality Control Commission's dairy rules, 20.6.6 NMAC as set forth in DIGCE's "Second Petition" filed in matter No. WQCC 13-08 (R). The specific changes that are addressed by my testimony herein are set forth below as they appear in DIGCE's Second Petition, although they have been grouped by topic for ease of review.

I previously provided written direct testimony in matter No. WQCC 12-09(R) regarding DIGCE's proposed amendments to the Water Quality Control Commission's dairy rules regarding nutrient management plan requirements, backflow prevention requirements, and requirements for calibration of flow meters. That testimony remains as my direct testimony for those changes, and I have no changes to that testimony. I have reviewed, am in support of and recommend that the Commission adopt the amendments to the dairy rules as contained in the Second Petition to Amend 20.6.6 NMAC (Dairy Rule) as filed with the Commission.

DIGCE'S PROPOSED AMENDMENTS RELATING TO MANURE SOLIDS SEPARATORS

I offer the following direct testimony in support of DIGCE's proposed amendments to certain provisions relating to various types of mechanisms used to separate and/ or settle solids from dairy wastewater. The primary purpose of solids separation for most New Mexico dairies

is to reduce solids in stored liquids to better facilitate land application of liquids using irrigation techniques. Excessive solids in wastewater that is land-applied through irrigation systems is undesirable due to potential plugging and wear of irrigation system components such as pumps, pipes, and particularly nozzles used for land application through sprinkler systems. For a few dairies, solids settling may facilitate treatment and handling of wastewater in digesters or other treatment units and may be employed to reduce accumulation of solids in storage and evaporative impoundments.

Many different methods are used to separate solids from wastewater, depending upon a number of factors. These methods include the use of a variety of filtration or screening devices and structures such as settling tanks, settling basins, or settling channels. Whatever method is used, the separated solids must be removed and handled. Solids removal can be accomplished by a variety of methods, including agitation and pumping or mechanical removal by equipment such as front-end loaders.

DIGCE's offers proposed amendments to several provisions of the dairy rules in order to recognize the variety of methods used for solids separation, to maintain flexibility in choosing an appropriate solids separation method, to avoid application of unnecessary and inappropriate design requirements for solids separation devices, particularly concrete structures, and to ensure that existing dairies that have and continue to function properly are not required to change existing solids separation practices or to unnecessarily employ solids separation if the existing dairy is functioning in a satisfactory manner without solids separation. Solids separation has little or no relationship to protection of ground water, and I believe that the existing rules impose unnecessarily prescriptive and detailed requirements that may be important for dairy management, but are not necessary for ground water protection.

The amendments, as proposed by DIGCE, which I will address in my testimony are quoted below, followed by questions and answers regarding those proposed amendments.

20.6.6.7 DEFINITIONS:

. . . .

(18) "Impoundment" means any structure designed and used for storage or disposal by evaporation of wastewater, stormwater, or a combination of both wastewater and stormwater~~, or used for solids settling~~. A multiple-cell impoundment system having at least one shared berm or barrier whose smallest cells have a cumulative constructed capacity of 10 percent or less of the constructed capacity of the largest cell shall be considered a single impoundment for the purposes of the dairy rule. A wastewater or stormwater transfer sump or a solids settling separator is not an impoundment.

Q. *DIGCE proposes to change the definition of "impoundment" in 20.6.6.7(B)(18) by deleting the words "or used for solids settling" in the second line and by adding the words "or a solids settling separator" in the last sentence of the definition. What are the reasons for these changes?*

A. Under the definition quoted above, without the DIGCE changes, ready literally it includes as an impoundment ". . .any structure . . . used for solids settling . . . ." A variety of different types of structures are used for solids settling, including concrete settling basins and channels. Concrete structures are not typically thought of as impoundments and should not be regulated as impoundments under the Dairy Rule for several reasons. For example, impoundments are subject to some specific design requirements, 20.6.6.17(C)(1)-(3) and (D)(1)-(2) and (4)-(9) NMAC. Several of these requirements, such as the liner requirements, are not practical, if applied to concrete structures used for solids settling. Without the rule change proposed by DIGCE, these design requirements for "impoundments" may technically apply to concrete solids settling structures. I do not believe this was intended by the Commission. Concrete solids settling structures also could be subject to separate ground water monitoring requirements for wastewater impoundments under 20.6.6.23(A)(1) NMAC of the existing rule. I

do not believe that such monitoring requirements were intended or should be required for concrete solids settling structures, ect.

Q. Based on your experience, how would DIGCE's proposed changes to the definition of "impoundment" relate to protection of ground water quality?

A. I do not believe that DIGCE's proposed changes to the definition will reduce protection of ground water quality. Solids separation in general has little or nothing to do with ground water protection. As discussed above, for most New Mexico dairies its purpose is to protect irrigation equipment.

20.6.6.17 ENGINEERING AND SURVEYING REQUIREMENTS FOR ALL DAIRY FACILITIES:

. . . .

C. Engineering plans and specifications requirements.

. . . .

(5) **Manure solids separation plans and specifications - existing wastewater system.** An applicant or permittee proposing or required to construct a new manure solids separator as a component of an existing wastewater storage or disposal system shall submit a scaled design schematic and supporting documentation, including design calculations. The separator shall be designed to accommodate, at a minimum, the maximum daily discharge volume authorized by the discharge permit, and the volume of manure solids associated with the wastewater discharge. Components of the separator that collect, contain or store manure solids prior to removal or land application shall be designed with an impervious material(s) to minimize generation and infiltration of leachate.

~~(a)~~ A scaled design schematic and supporting documentation for a proposed separator shall be submitted to the department with the application for a new, renewed or modified discharge permit.

~~(b) A scaled design schematic and supporting documentation for a separator not proposed by the applicant or permittee but required to achieve compliance with the dairy rule shall be submitted to the department within 90 days of the effective date of the discharge permit.~~

Q. DIGCE proposes to delete subparagraph 20.6.6.17(C)(5)(b). What are the reasons for this changes?

A. This change is proposed in conjunction with the proposed amendment to 20.6.6.20(F), the next change addressed below, and the reasons for those proposed changes are discussed below. If the Commission adopts DIGCE's proposed changes to 20.6.6.20(F), which would eliminate a prescriptive requirement for "a manure solid separator" for existing dairies, then the

Department will not be requiring a manure solid separator for an existing dairy. Subparagraph (a) of this section would continue to require submission of a design schematic and supporting documentation for a new or modified manure solid separator proposed by the permit holder for an existing dairy.

Q. In your experience, how would this change relate to protection of ground water quality?

A. As previously discussed, solids separation is a management question and has little or no relationship to ground water protection. Consequently, I do not believe that this proposed change, of not requiring a solids separation, will reduce protection of ground water quality.

20.6.6.20 OPERATIONAL REQUIREMENTS FOR ALL DAIRY FACILITIES:

F. Manure solids separator installation – New Wastewater system. A permittee shall employ manure solids separation. ~~All wastewater discharges to an impoundment shall be made through a manure solid separator.~~

~~(1)~~ A permittee installing a new wastewater storage or disposal system shall, before discharging to the new system, construct a manure solids separator(s) in accordance with the construction plans and specifications submitted with the application for a new, renewed or modified discharge permit, or those submitted after issuance of a discharge permit to achieve compliance with the dairy rule. Before discharging to the new system, the permittee shall submit to the department confirmation of solids separator construction, including separator type(s) and location(s).

~~(2) If an existing dairy facility does not employ manure solids separation, the permittee shall construct a manure solids separator(s) within 150 days of the effective date of the discharge permit. The permittee shall submit confirmation of solids separator construction, including separator type(s) and location(s), to the department within 180 days of the effective date of the discharge permit.~~

Q. DIGCE proposes to delete a sentence in 20.6.6.20(F) which states: "All wastewater discharges to an impoundment shall be made through a manure solid separator." What are the reasons for this change?

A. To eliminate the requirement that a solids separator be used. There are a variety of methods used for solids separation both mechanical and passive each with varying degrees of efficiency. However, not all facilities require a separator to operate properly, and the arbitrary requirement to use them encroaches on the management's authority.

Q. DIGCE proposes to delete paragraph 20.6.6.20(F)(2). What are the reasons for this change?

A. This proposed change relates to the previously proposed amendment to 20.6.6.17(C)(5)(b) and would eliminate the Dairy Rule requirement for an existing facility that does not "employ manure solids separation" to construct a manure solid separator within a specified timeframe. As discussed above, there are many acceptable and technically sound methods to separate solids from wastewater. A few smaller dairies may collect wastewater in a tank and apply it directly to land application areas using a "honey wagon." In that case, there also is no need for solids separation.

Q. In your experience, how would these changes relate to protection of ground water quality?

A. As I have previously testified, I do not see a relationship between mandatory solid separation and ground water protection. Solid separation is typically, but not always, useful for dairy management as part of an overall wastewater management system, but some dairies either achieve solid mechanically/passive or directly apply wastewater without solid separation. I do not believe that ground water protection is sacrificed in either case.

TESTIMONY IN SUPPORT OF CHANGES RELATING TO FLOW METERING

The next few amendments proposed by DIGCE relate to the requirements for flow metering. These changes do not fundamentally change the flow metering requirements in the existing Dairy Rule, but are designed to eliminate confusion in the existing Dairy Rule, provide for more flexibility for the Department to approve some alternative flow metering approaches without the need for variances, and to eliminate unnecessary requirements.

20.6.6.17 ENGINEERING AND SURVEYING REQUIREMENTS FOR ALL DAIRY FACILITIES:

. . . .

C. Engineering plans and specifications requirements.

. . . .

(7) **Flow metering plans [~~and specifications~~].** An applicant or permittee proposing or required to install a flow meter(s) shall submit documentation to support the selection of the proposed device as appropriate for the expected flow rate along with a description of the location and information on the installation or construction of each device.

(a) Such information proposed by the applicant or permittee shall be submitted to the department with the application for a new, renewed or modified discharge permit.

(b) Such information not proposed by the applicant or permittee but required to achieve compliance with the dairy rule shall be submitted to the department within 90 days of the effective date of the discharge permit.

Q. DIGCE proposes to delete the words "and specifications" from the heading to 20.6.6.17(C)(7). What are the reasons for this change?

A. This change is proposed to reflect that the text of the paragraph to which the heading applies does not mention or require submission of flow metering specifications. This is a non-substantive change to avoid confusion that might arise if the heading uses the term "specification" but the text does not.

20.6.6.20 OPERATIONAL REQUIREMENTS FOR ALL DAIRY FACILITIES:

. . . .

J. Flow meter installation. A permittee shall employ a flow metering system that uses flow measurement devices (flow meters) to measure the volume of wastewater discharged at the dairy facility. Flow meters shall be installed in accordance with the plans submitted with the application for a new, renewed or modified discharge ermit, or those submitted after issuance of a discharge permit to achieve compliance with the dairy rule, pursuant to his section, Subsection C of 20.6.6.17 NMAC, and Subsections G and H of 20.6.6.21 NMAC. Flow meters shall be ~~physically and permanently~~ labeled with the discharge permit number, meter identification nomenclature as pecified in a discharge permit, and the month and year of meter installation.

Q. DIGCE proposes to delete the words "physically and permanently" from the third sentence of 20.6.6.20(J). What are the reasons for this change?

A. The proposed change does not eliminate the labeling requirement, but allows for the use of more practical labeling methods. It is not entirely clear what is meant by "physical and

permanent" labeling, but it could mean that the rule requires something like an engraved metal plate. In my opinion, there is little purpose or need for the labeling required by the existing rule. However, DIGCE is not proposing to eliminate the labeling requirement, just to allow simpler labeling methods. For example, a permanent marker could be easily used to label a flow meter with the required information with the same result but without the unnecessary trouble and expense of designing, purchasing and installing an engraved metal plate.

Q. In your experience, how would this change relate to protection of ground water quality?

A. I do not see any relationship in the method of labeling and ground water protection.

K. Flow metering methods. Flow metering shall be accomplished by the following methods.

(1) For pumped flow discharge or transfer situations, an applicant or permittee shall install a closed-pipe velocity sensing totalizing flow meter(s) on the pressurized discharge or transfer line(s).

(2) For gravity flow discharge or transfer situations, an applicant or permittee shall install a closed pipe totaling flow meter or an open-channel primary flow measuring device(s) (flume or weir), equipped with head sensing and totalizing mechanisms, on the discharge or transfer line(s).

(3) An applicant may propose and the department may accept a proposal to meter flows by metering the water supply. The proposal shall provide specific detail regarding the flow meter to be used and the relationship between the volume of water supplied and wastewater volume.

Q. DIGCE proposes to add the words "a closed pipe totaling flow meter" to paragraph 20.6.6.20(K)(2). What are the reasons for this change?

A. The existing rule appears to prohibit the use of a closed pipe with a totalizing flow meter if wastewater flows by gravity and pumping is not used. Given the right circumstances and proper design a totalizing flow meter could be used in gravity flow applications. By the way, the word "totaling" in the proposed rule language should be changed to "totalizing." Consequently, DIGCE proposes to expressly allow for the use of closed pipe conveyances with totalizing flow meters in gravity-flow situations, not just pumped water applications.

Q. DIGCE proposes to add a new paragraph 20.6.6.20(K)(3) that would allow the Department to accept a proposal to meter wastewater flows by metering the water supply. What are the reasons for this change?

A. Many existing discharge permits allow the measurement or estimation of wastewater flow rates and volumes based on metering the water supply at a point that represents all water used for washing or any other use that generates wastewater. This is a reasonably accurate method as there is a direct relationship between the volume of water supplied for washing and the volume of wastewater generated.

Use of flow meters to measure a water supply also is a superior method because it is easier to maintain a flow meter on a "clean" water supply than wastewater. Wastewater contains solids and other materials that can interfere with a flow meter that requires more maintenance or limit the life of the flow meter. Consequently, metering of water supply is usually more reliable and consistent than metering wastewater.

DIGCE's proposed change would not automatically allow for metering a water supply rather than directly metering wastewater, but would require a specific proposal from the permit applicant showing that the water supply would be metered at a location representative of the volume of water that becomes wastewater and any other factors that should be considered in using measurements of water supply to estimate wastewater volumes. If the Department does not find the proposal to be acceptable, it does not have to approve the proposed metering method. In my opinion, this is a reasonable issue to allow the Department to vary from the prescriptive rule requirements without the need for a variance.

Q. In your experience, how are these changes related to protection of ground water quality?

In my experience there are numerous instances that metering the supply could and should be considered as an option. Consequently, I do not believe that there would be any sacrifice of ground water quality if the Commission authorizes the Department to accept a plan for an alternative metering method.

CHANGES RELATING TO LAND APPLICATION OF WASTEWATER

20.6.6.21 ADDITIONAL OPERATIONAL REQUIREMENTS FOR DAIRY FACILITIES WITH A LAND APPLICATION AREA:

. . . .

C. Land application area - fresh irrigation water required. Wastewater shall only be applied to fields within the land application area receiving fresh irrigation water. Fresh irrigation water shall be used as the primary source to meet the water consumptive needs of the crop to support crop production and nutrient removal. Wastewater and stormwater are intended as sources of crop nutrients and shall not be used as a primary source to meet the water consumptive needs of the crop. An applicant may propose and the department may accept a proposal to apply wastewater to crops or grazing land without using fresh water for irrigation if the proposal demonstrates to the department's satisfaction that crops or plants to be grazed can be successfully maintained without fresh irrigation water.

Q. DIGCE proposes to add a sentence to 20.6.6.21(C) NMAC that would allow the Department to accept a proposal to apply wastewater to crops or grazing land without using fresh water for irrigation. What are the reasons for this change?

A. This provision of the Dairy rule allows land application of wastewater only to a field that receives fresh irrigation water. In some parts of New Mexico, this may be appropriate as crops cannot be grown successfully without irrigation. However, there are parts of the state, such the eastern High Plains, including Curry and Roosevelt counties, where crops are successfully grown without irrigation using fresh water. In these areas, it is practicable to apply dairy wastewater to fertilize fallow ground prior to planting. The wastewater can be applied to provide nutrients at agronomic rates to the benefit of the crops planned to be grown without any harm to the crops. typically, this practice would not be utilized by a large dairy, but there are small dairies that can practicably apply stored wastewater to dry land crops in this manner.

DIGCE's proposed rule change would allow a dairy who can successfully operate in this manner to propose land application of wastewater for dry land crops and would allow the Department to accept that proposal if the applicant shows that crops can be successfully maintained without irrigation.

Q. In your experience, is it reasonable to expect that crops can be maintained if wastewater is applied without fresh irrigation water? If so, are there any particular circumstances that should be considered?

A. Yes, as discussed above, crops can be grown in parts of the state, though not the entire state, without fresh irrigation water. Factors that should be considered are annual and seasonal rainfall and local experience with successful dry land crops.

Q. In your experience, how would this practice relate to protection of ground water quality?

A. If dry land crops can be grown successfully, and wastewater is applied, along with other fertilizers as needed, at agronomic rates in accordance with a nutrient management plan, the application of wastewater for dry land can be accomplished without impacting ground water.

G. Flow metering - wastewater to land application area. A permittee shall install flow meters to measure the volume of wastewater discharged from the wastewater or combination wastewater/stormwater impoundments to the land application area. The flow meter(s) shall be installed on the discharge line(s) from the wastewater impoundment(s) or tank to the distribution system for the land application area. Meter installation and confirmation of meter installation shall be performed pursuant to Subsections J, K and M of 20.6.6.20 NMAC.

Q. DIGCE proposes to add the words "or tank" to 20.6.6.21(G). What are the reasons for this change?

A. Some dairies may utilize a tank for temporary storage of wastewater prior to land application. DIGCE's propose change simply clarifies that if a tank is used, the flow meter can be installed between the tank and the distribution system, rather than between an impoundment and the tank. It also accounts for a few situations, typically at small dairies, where wastewater is

collected in a tank rather than an impoundment. In my opinion, this change would not affect the quality of the data collected from the flow meter to show the volume of wastewater that is land-applied and would have no effect on ground water quality.

J. Crop removal - mechanical or grazing. A permittee shall remove crops from fields within the land application area by mechanical harvest ~~unless an alternative proposal for the use of~~or grazing ~~is submitted with the application for a new, renewed, or modified discharge permit. If grazing is the method proposed for crop removal, the nutrient management plan (NMP) prepared pursuant to Subsection [K] I of this section shall include a proposal for the use of grazing for crop removal by means of an actively managed rotational grazing system which promotes uniform grazing and waste distribution throughout the field(s) (and pastures within the field). Proposals shall quantify the degree of nitrogen removal expected to be achieved by grazing, and shall provide scientific documentation supporting the estimated nitrogen removal and justification for the selection of input parameters used in calculations or computer modeling. The NMP proposing grazing for crop removal shall be implemented in its entirety. Annual updates to the NMP shall include updates to the grazing plan as well as a report of actual weight gains, actual nitrogen uptake of the crop, and estimated crop and nutrient removal from the previous season.~~ An NMP which proposes grazing for crop removal shall also include, at a minimum, estimated values for the following elements.

(1) The length of the grazing season.
(2) The size and number of animals to be grazed.
(3) The estimated weight gain of animals to be grazed, or estimated intake for maintenance or milk production.
(4) The calculations to determine stocking rates, total acreage needed and residency period.
(5) The plant species used to establish pastures and the pasture renovation practices to be employed.
(6) The yield of plant species grown in each pasture and the forage supplied on a monthly basis.
(7) The grazing management system employed and a map indicating key features of the system including water tanks, fencing, and pasture layout with numbering system and acreage of each pasture.

Q. DIGCE proposes to delete language from 20.6.6.21(J) NMAC specifying requirements for a proposal for crop removal by grazing. What are the reasons for these changes?

A. The current rule language requires a special showing and scientific documentation in order to account for nitrogen removal by crops are harvested by grazing. However, harvesting crops by grazing is a normal standard practice that will be adequately addressed in the NMP. The existing documentation requirements are excessive and not necessary. Nitrogen utilization is more a related to crop selection than the method of harvest. The NRCS 590 job sheet already estimates the nutrient requirements based on type of crop planted and whether they are harvested for grain, hay, silage or by grazing. I have attached as exhibit "Ashcraft - 1" copies of two examples of NRCS standard job sheets for crops harvested by grazing, in this particular case

bermuda grass pasture. Harvesting the crops by grazing or otherwise simply removes some of the plant mass that contains a portion of the nitrogen removed from the soil by the growing crops. When crops are removed by grazing, the grazing animals leave a limited amount of manure in the grazed areas, but the amount of manure left be grazing animals is minimal not generally significant in determining appropriate nitrogen application rates. The required annual soil test will be used to more accurately address any potential ground water problems.

Q. Without the language that DIGCE proposes to strike, would the contents of a nutrient management plan be sufficient to estimate nitrogen removal by grazing?

A. DIGCE's proposal would retain rule language requiring various metrics pertaining to the grazing and crops that can be used to estimate nitrogen removal by grazing. The more direct means of measuring nitrogen in the soils and avoiding over application of nitrogen is the soil sampling required by the rule. Soil sampling will determine nutrient requirements for the cropping system.

Q. In your experience, how would this proposed change relate to protection of ground water quality?

A. The concern as it relates to ground water protection is the accumulation of excess nitrogen in soils due to over application of wastewater and fertilizer over time, such that the excess nitrogen can potentially leach from the soils into ground water. I do not believe that adoption of DIGCE's proposed change to this section will have any effect on protection of ground water quality. As discussed above, in my opinion the "mass balance" approach relating the nitrogen application and removal is a secondary method of measurement as it relates to nutrient management, with soil sampling being the primary measure and protection.

~~**K. Crop removal - changes to method(s).** If a permittee proposes to change the method(s) (i.e., mechanical versus grazing) of crop removal on any field within the land application area authorized by the discharge permit, the permittee shall apply to modify the discharge permit. The permittee shall submit an application which includes the proposed change(s) pursuant to Subsection I and J of this section. The permittee shall not implement the changes unless the department issues a modified permit approving the changes.~~

Q. DIGCE proposes to delete subsection 20.6.6.21(K) regarding a requirement to modify a permit for changes to crop removal methods. What are the reasons for these changes?

A. My concern with this subsection is that it would require a permit "modification" in order to change the method of harvesting crops. This is not practicable due to the time and expense required for a permit modification and the need to change crops harvesting methods that may arise due to weather conditions, including precipitation and hail, market conditions, and other factors. Foreseeable changes in crop removal methods can be identified in a nutrient management plan and actual crop removal practices can be accounted for in implementation of the nutrient management plan without the need for a permit modification.

Q. In your experience, how would this proposed change relate to protection of ground water quality?

A. In my opinion, this change will have no bearing on protection of ground water quality. As I have previously testified, crop removal methods and harvesting is considered primarily with respect to mass balance calculations to show nitrogen removal. However, in my experience and opinion, this is a secondary check for nutrient management. The primary measurement used by nutrient management planners to determine appropriate nutrient application rates is crop selection and soil sampling.

TESTIMONY ON CHANGES RELATING TO SAMPLING REQUIREMENTS

20.6.6.24 MONITORING REQUIREMENTS FOR ALL DAIRY FACILITIES:

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D. Stormwater sampling and reporting. A permittee shall collect stormwater samples on a quarterly basis from each stormwater impoundment unless the stormwater will be transferred ~~. The samples shall be collected as soon as possible after a storm event and before transferring the stormwater~~ to a wastewater impoundment(s) ~~or~~before being sent to the land application area. The samples shall be analyzed for nitrate as nitrogen, total Kjeldahl nitrogen, chloride, total sulfur and total dissolved solids pursuant to this section. The permittee shall include analytical results, or a statement that stormwater runoff did not occur, in the quarterly monitoring reports submitted to the department.

Q. DIGCE proposes to change the sampling requirements for stormwater impoundments if the stormwater will be transferred to a wastewater impoundment before being sent to a land application area. What are the reasons for these changes?

A. The primary reason to sample stormwater is to determine the nutrient content of the stormwater that will be applied to the land. DIGCE's change would reduce separate stormwater sampling and analysis if stormwater is mixed with wastewater before land application. When stormwater is mixed with wastewater prior to land application, the nutrient content of the stormwater is accounted for through sampling of the mixture of wastewater and stormwater. Also, stormwater that is mixed with wastewater prior to application is not measured, therefore the sampling and analysis would be of little value.

Q. In your experience, how would the change to this sampling requirement relate to protection of ground water quality?

A. In my opinion, DIGCE's change, if adopted by the Commission, would have no bearing on protection of ground water quality.

20.6.6.25 ADDITIONAL MONITORING REQUIREMENTS FOR DAIRY FACILITIES WITH A LAND APPLICATION AREA:

. . . .

C. Wastewater to be land applied - sampling and reporting. A permittee shall collect and analyze wastewater samples on ~~a quarterly~~an annual basis for nitrate as nitrogen, total Kjeldahl nitrogen, chloride, total sulfur and total dissolved solids pursuant to Subsection B of 20.6.6.24 NMAC. Representative samples shall be collected from the wastewater impoundments unless an alternative method is approved for good cause, including safety. The representative samples shall consist of eight samples taken from eight different locations evenly distributed throughout the impoundment or using an alternative method approved by the department for good cause. A permittee shall submit the analytical results to the department in the quarterly monitoring reports.

Q. DIGCE proposes to change the frequency for sampling wastewater. What are the reasons for this change?

A. Sampling of wastewater, particularly from an impoundment, is costly and somewhat hazardous. Especially since the sampling method specified in the rule requires collection of samples from eight locations within an impoundment to be composited. The results of these samples are used for estimating the nitrogen loading in preparation of the NMP. These results are variable and of limited value compared to the annual soil sampling. Due to the potential hazards and expense sampling, the sampling events should be limited to annually or biannually with minimal impact.

Q. In your experience, would how would this reduction in sampling frequency relate to protection of ground water quality?

A. In my view, reduction of the sampling frequency will not impact protection of ground water quality. Annual or biannual sampling, in conjunction with past data used as a check, can provide a reasonable estimate of the nutrient content of wastewater suitable for planning purposes.

Q. DIGCE also proposes a change that would allow the Department to approve an alternative method for sampling. What are the reasons for this change?

A. Alternate methods could be more reliable than taking samples directly from an impoundment. In some instances it may be practicable to take samples from pipes or sumps being used to remove wastewater from the impoundment. That sampling method can provide a more direct measure of nutrients in wastewater going to land application. The Department would have to accept and approve an alternative method before it could be used.

E. Irrigation water - sampling, volume applied, and reporting. A permittee shall monitor irrigation wells used to supply fresh water to the fields within the land application area to account for additional potential nitrogen supplied to the land application area in the following manner.

(1) Each irrigation well shall be identified in association with the field(s) to which it supplies fresh water.

(2) ~~An annual~~ A sample of irrigation water supplied from each well or a group of wells if more than one well supplies a field shall be collected and analyzed for nitrate as nitrogen and total Kjeldahl nitrogen at least once every five years, pursuant to Subsection B of 20.6.6.24 NMAC.

(3) The annual volume of irrigation water applied to each field within the land application area shall be estimated ~~for each well~~.

(4) The permittee shall submit the analytical results and the estimated annual volume of irrigation water applied ~~from each well~~ to each field within the land application area to the department in the monitoring reports due by May 1.

Q. DIGCE proposes to change the requirement to sample irrigation water from annually to once every five years. What are the reasons for this proposed change?

A. Generally nitrate/nitrogen levels in irrigation wells are fairly stable with small variances and annual sampling would not be necessary.

Q. DIGCE also proposes to change these requirements so that volumes and analytical results do not have to be provided for each well. What are the reasons for this proposed change?

A. Most irrigation systems utilize more than one irrigation well. Sampling at the common outlet (field or pivot etc.) would adequately account for the values in the irrigation water.

Q. What is the sampling information used for?

A. The nitrogen values are used in estimating nitrogen loading in the Nutrient Management Plan.

Q. In your experience, will these proposed changes affect the quality of the information used for the nutrient management plan?

A. The proposed changes would have minimal or no effect on the quality of the nutrient management plan.

G. Land application data sheets. A permittee shall complete land application data sheets for each field within the land application area to document the crop grown and amount of total nitrogen applied from wastewater, stormwater, manure solids, composted material, irrigation water and other additional fertilizer(s), and the residual soil nitrogen and nitrogen credits from leguminous crops. The permittee shall submit a land application data sheet or a statement that land application did not occur to the department in the quarterly monitoring reports. The land application data sheet shall include the following elements ~~from the previous six quarters~~.

Q. DIGCE proposes to delete a requirement for a permittee to provide land application data sheet information from the previous six quarters. What are the reasons for this change?

A. The six quarter requirement does not appear to serve any practical function, especially since the soil sampling and NMP is completed and documented annually.

K. Soil sampling - initial event in a discharge permit term. A permittee shall collect composite soil samples from each field within the land application area for the first soil sampling event during the first year following the effective date of the discharge permit. Composite soil samples shall be collected ~~in the five-month period between September 1 and January 31~~ for all fields regardless of whether the field is cropped, remains fallow, or has received wastewater or stormwater. One surface composite soil sample (first-foot) and two sub-surface composite soil samples (second-foot and third-foot) shall be collected from each field. Composite soil samples shall be collected and analyzed according to the following procedure.

L. Soil sampling - routine. Beginning in the year following the initial soil sampling required by this section, the permittee shall collect annual soil samples from each field within the land application area that has received or is actively receiving wastewater or stormwater. ~~Composite soil samples shall be collected in the five-month period between September 1 and January 31.~~ For those fields that have never before received wastewater, the permittee shall collect soil samples immediately before initial wastewater application and annually thereafter. Once a field has received wastewater it shall be sampled annually regardless of whether the field is cropped, remains fallow, or has recently received wastewater or stormwater. One surface composite soil sample (first-foot) and two sub-surface composite soil samples (second-foot and third-foot) shall be collected from each field. Composite soil samples shall be collected and analyzed according to the following procedure.

Q. DIGCE proposes to delete a specified timeframe for collection of soil samples from subsections 20.6.6.25(K) and (L). What are the reasons for these changes?

A. Soil sampling is used for both crop production and ground water protection. Since the majority of the land application areas are "double cropped," *i.e.,* two crops are produced each year, there is no reason to limit the sampling dates to particular seasons.

Q. What is the soil sampling information used for?

A. As noted above, crop production and to prevent excessive nitrogen build-up in the soil.

Q. In your experience, will eliminating the specified time frame for collection of soil samples reduce the quality of information when used in a nutrient management plan?

A. This change would not have any effect on the quality of the Nutrient Management Plan

20.6.6.26 ADDITIONAL MONITORING REQUIREMENTS FOR DAIRY FACILITIES DISCHARGING TO AN EVAPORATIVE WASTEWATER DISPOSAL SYSTEM: Wastewater to be evaporated - sampling and reporting. A permittee shall collect a composite wastewater sample on a semi-annual (once every six months) basis from each wastewater or combination wastewater/stormwater impoundment used for disposal by evaporation. ~~The composite sample from each impoundment shall consist of a minimum of six sub-samples collected around the entire perimeter of each impoundment and thoroughly mixed.~~ Samples shall be analyzed for nitrate as nitrogen, total Kjeldahl nitrogen, chloride, total sulfur and total dissolved solids pursuant to Subsection B of 20.6.6.24 NMAC. A permittee shall submit the analytical results to the department in the monitoring reports due by May 1 and November 1

Q. DIGCE proposes to change the sampling method to collect samples from an evaporative wastewater disposal system. What are the reasons for this change?

A. If the wastewater is being evaporated and not land applied I do not see any value to sampling data, so complex sampling with six-subsamples is not necessary.

Q. In your experience, how would this change relate to protection of ground water quality?

A. It would not have any effect.

.20.6.6.30 CLOSURE REQUIREMENTS FOR ALL DAIRY FACILITIES:

A. Permanent closure of dairy facility or impoundments. The following closure actions shall be performed at dairy facilities.

(1) For permanent closure of a dairy facility.

(a) The department shall be notified no later than 30 days after wastewater discharge has permanently ceased at the dairy facility.

(b) Installation of ~~all~~ any additional monitoring wells shall be completed pursuant to 20.6.6.23 NMAC.

(c) All wastewater and combination wastewater/stormwater impoundments shall be emptied within six months of permanently ceasing wastewater discharge at the dairy facility; combination wastewater/stormwater impoundments may continue to receive stormwater after removal of the impounded wastewater/stormwater. All stormwater and combination wastewater /stormwater impoundments shall be emptied of stormwater within one year of ~~removing all livestock from the dairy facility~~cessation of wastewater discharge. Wastewater and stormwater removed from impoundments shall be applied to the designated land application area, as authorized by a discharge permit. In the event that land application is not authorized by a discharge permit, a disposal plan shall be submitted for department approval and the plan implemented upon department approval.

(d) Manure solids and compost shall be removed from surface areas at the dairy facility and

applied to the designated land application area, as authorized by a discharge permit, or transferred off-site for proper disposal ~~within one year of removing all livestock from the facility~~.

(e) Complete removal of manure solids from the wastewater impoundment(s) shall be achieved within two years of permanently ceasing wastewater discharge. Complete removal of manure solids from the stormwater and combination wastewater/stormwater impoundment(s) shall be achieved within two years of ~~removing all livestock from the dairy facility~~cessation of wastewater discharge. Manure solids shall be applied to the designated land application area, as authorized by a discharge permit. In the event that land application is not authorized by a discharge permit, a disposal plan shall be submitted for department approval and the plan implemented upon department approval.

(f) Impoundment liners shall be perforated or removed and the impoundments shall be re-graded with clean fill to blend with surface topography to prevent ponding within two years of permanently ceasing wastewater discharge ~~and removing all livestock from the facility~~.

Q. DIGCE proposes changes to the closure section so that requirements to empty impoundments, to remove manure solids, and closure with respect to impoundment liners are changed so they relate to the cessation of wastewater discharges and do not relate to removal of livestock. What are the reasons for these changes?

A. Wastewater discharges at a dairy cease when cows are no longer being milked. A dairy can stop milking cows for many reasons, such as economic conditions, retirement, building a new dairy, or a decision to sell a dairy. However, when a decision is made to stop milking cows, that does not mean that the dairy will be permanently closed. In some instances, dairy lots may be used for other purposes, such as feeding heifers or other animals that are not milked. In some cases, a dairy owner will intend to hold the dairy for sale, and a sale can take some years to accomplish. In that case, the dairy owner will not want to lose the value of the assets, including features such as lined ponds. DIGCE's proposed changes are intended to reflect the different scenarios for dairy closure and to provide more flexibility.

The change to paragraph (1) subparagraph (b) to replace "all" with "any additional" is for clarity and is intended to reflect that, in most cases, the monitoring wells required by 20.6.6.23 NMAC will already be installed, and it will not be necessary to reinstall "all" of the monitoring wells.

The changes to paragraph (1) subparagraphs (c) and (e) are proposed because the activity regulated by the discharge permit program is the discharge of wastewater, not the regulation of livestock feeding. Consequently, removal of water and accumulated manure/solids from stormwater impoundments should be tied to cessation of wastewater discharges, not removal of all livestock. This change may actually have the effect of requiring removal of water and solids accumulated during dairy operations sooner, rather than later, in the case when dairy lots are used for feeding of other livestock. However, the Commission should be aware that stormwater ponds may remain in place after water accumulated during dairy operations is removed, and additional stormwater may collect in the impoundments after that.

The change to paragraph (1) subparagraph (d) recognizes that a dairy may be held for sale for a long period of time during which neither wastewater discharges nor the placement of livestock exist. Consequently, this change removes any specified time frame for removal of manure from surface areas. The removal of manure from all surface areas typically would be undertaken when an owner decides that the land where a dairy is located will no longer be used as a dairy and will be redeveloped for other purposes. The timeframe for that activity cannot be determined or specified by rule, as it is an economic decision of the owner.

The changes to paragraph (1), subparagraph (f) also reflect that closure activities should be tied to the regulated activity of wastewater discharges and not the feeding of other livestock. This is discussed above with regard to the changes to subparagraphs (c) and (e). There is a difference between those subparagraphs and subparagraph (f), however, in the subparagraph (f) requires liner perforation or removal only after a decision to "permanently" cease wastewater discharges. I understand that this is intended to mean that the dairy owner has decided that the facility will not be used as a dairy in the future or sold as a dairy and that the lined

impoundments no longer are an asset to be preserved. As discussed above, this is an economic decision to be made by the owner.

Q. In your experience, how would these changes relate to protection of ground water quality?

A. I do not see any reason why these changes would have any bearing on protection of ground water quality. The changes are intended to clarify the requirements and timeline for a typical dairy closure and are tied largely to the distinction between the regulated activity of dairy discharges requiring a discharge permit and the feeding of other animals which is not regulated under the dairy rules.

This concludes my written direct testimony.

Electronically Approved 10/17/14
Loney Ashcraft

590 Nutrient Mgt. Jobsheet for Organic and Manure Land Application

Client Name:		Acres:	96	Date:	10/10/2014	Field ID:	1

Application information (*enter the units that will be or has been applied to the field*):					
Crop Rotation: Pasture - Bermuda				Needed for field (acin):	384
Liquid Applied:	4	AcIn/ac		(gal):	10,425,600
Solids Applied:	10	ton/ac	Needed for field:	Tons	960
Liquid Loads Applied:		1000gal/ac	Loads needed for field:		

Nutrient Content of Organic Material

Solid-Lab Report	% Moisture	TKN (%) (dry)	NH_4-N (ppm) (dry)	P_2O_5 (%) (dry)	K_2O (%) (dry)
Fill in Lab data:					

Solid Book Values (select even if test values are used)	% Moisture		TKN (lbs/wet ton)		NH_4-N (lbs/ton)		P_2O_5 (lbs/wet ton)		K_2O (lbs/wet ton)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
Dairy Cattle (30% wet wt) NM (Aver	30	0	25	0	0.4	0.0	17	0	35	0

Liquid-Lab Report	NH_3-N (mg/L)	TKN (mg/L)	NO_3-N (mg/L)	Tot-PO_4 (mg/L)	K (mg/L)
Fill in Lab data:		300			

Liquid	% Moisture		TKN (lbs/acin)		NH_4-N (lbs/acin)		P_2O_5 (lbs/acin)		K_2O (lbs/acin)	
	Book	Test	Book	Test	Book	Test	Book	Test	Book	Test
NM Dairy Ponds (>99.5% liq.) Ave.	99.5		0	68	0	41	22	0	93	0

	TKN (lbs/1000gal)		NH_4-N (lbs/1000gal)		P_2O_5 (lbs/1000gal)		K_2O (lbs/1000gal)	
	Book	Test	Book	Test	Book	Test	Book	Test
	0.0			0.0		0.0		0.0

N Volatilization

Solid (type of application)	Type of Climate	Percent Remaining	NH_4-N Remaining
Broadcast-incorporated in 4 days	Warm Dry	60 %	0 (lbs/ton) NH4-N
Liquid (type of application)	**Type of Climate**	**Percent Remaining**	**24.8** (lbs/acin) NH4-N
Surface Irr w/o incorp & w/o crop canopy	Warm Dry	60 %	0.0 (lbs/1000gal) NH4-N

Mineralization of N, P, & K

Manure Source	Percent Nutrient Available the 1st Year			
	Organic N	P	K	
Beef & Dairy Solid w/o bedding	35 %	75 %	80 %	Solid Source
Lagoon or diluted Pond	40 %	75 %	80 %	Liquid Source

Solid	Organic N (lbs/ton)	P_2O_5 (lbs/ton)	K_2O (lbs/ton)
	9	13	28

Liquid	Organic N (lbs/acin)	P_2O_5 (lbs/acin)	K_2O (lbs/acin)
	11	16	75
	Organic N (lbs/100gal)	P_2O_5 (lbs/1000gal)	K_2O (lbs/1000gal)
	0.00	0.0	0.0

Denitrification of N

Organic Matter Content (%)	Soil Drainage Class (See Survey Information)	Percent Remaining (%)
2-5	Well Drained	80

Summary of Nutrients

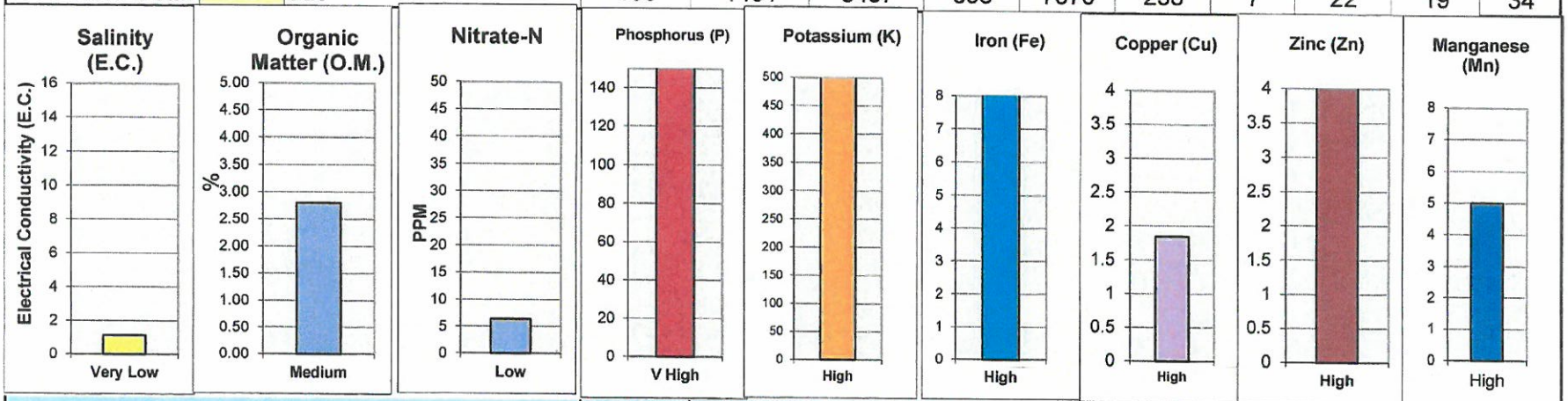
Net by Form as applied	lbs/1000gal	lbs/ac in	lbs/ton
N	0.0	28	7
P_2O_5	0.0	16	13
K_2O	0.0	75	28

Total Nutrients Applied (net to the field)	All Forms N (lbs/ac)	P_2O_5 (lbs/ac)	K_2O (lbs/ac)
	183.8	195.6	581.1

N.M.S.U.-Soil Test Interpretation Report vs 5.1 - (590 Nutrient Management Jobsheet) June 2014

XC to County Agent:	CHAVES	Save To Farm Sum	Field ID:	1	Crop Rotation:	Pasture - Bermuda	
Client Name:			Record #:	1	Square feet:	or Acres: 96.000	Irr. Water (acin/ac): 33
Address:			Planner Name:		Form Notes:		
	88202	Date: 10/10/2014	Depth increment (in):	12	Sodium Adsorb. Ratio:	0.6	ESP: 0.00
Phone:			Note: E.C.-Electrical Conductivity or Saltiness, O.M.-Organic Matter, and ESP-Exchangeable Sodium %.				

Samp. ID (#)	pH (#)	E.C. (mmhos/cm)	Soil Texture (class)	O. M. (%)	NO_3-N (ppm)	P (Olsen) (ppm)	K(H_2O) (ppm)	Mg (ppm)	Ca (ppm)	Na (ppm)	Cu (ppm)	Zn (ppm)	Mn (ppm)	Fe (ppm)
	8.1	1.14	Loam	2.8	6.4	159.0	753.0	501.0	4110.0	144.0	1.9	5.8	5.0	8.9
Crop to grow:	Pasturegrass, Bermuda, established				lbs/ac	P_2O_5 (lbs/ac)	K_2O (lbs/ac)	lbs/ac	lbs/ac	lbs/ac	lbs/ac	lbs/ac	lbs/ac	lbs/ac
Yield Goal:	6.5	t/ac			109	1401	3487	898	7370	258	7	22	19	34



Nutrient Recommendation:	N lbs/ac	P_2O_5 lbs/ac	K_2O lbs/ac	Mg lbs/ac	Ca lbs/ac	Fe lbs/ac	Cu lbs/ac	Zn lbs/ac	Mn lbs/ac
Recommended Nutrient Rate:	193	0	0	0	0.0	0.0	0.0	0.0	0.0
Organic Nutrient Source (Liquid or Solid Manure):	184	196	581						
Irrigation Water Credits (ppm NO_3-N): 1	7								
Other Nutrient Sources (Standing Legume Crop.):									
Supplemental Nutrient Rate:	1	0	0	0	0.0	0.0	0.0	0.0	0.0
Available Nutrients >= Crop Requirements:	NO	Caution P	Caution K	NO	NO	NO	NO	NO	NO

General Note: Apply P2O5 & K2O in the spring, if needed. Split fertilizer N applications to coincide with harvest regrowth. Consider slow release N for improved efficiency. Follow good Irrigation Water Mgt.

Specific Notes:

Salinity Rating: Very Low

Gypsum Rate (100% pure): 0 lbs/ac or 0 lbs/1000ft² — #N/A

Salinity not an issue.

Suggested Fertilizer Blend				
Total Blend (lbs/ac):	3	3 lbs/ac	Urea 45% N	308.1 lbs Total Needed
Blend Cost ($/ac):	$0.73	0 lbs/ac		0.0 lbs Total Needed
		0 lbs/ac		0.0 lbs Total Needed
		N-P2O5-K2O G	45% 0% 0%	308.1 Tt Blend (lbs)

Client Signature: Planner Signature:

Fertilizer Cost Note: *Default costs are from NASS and are estimated. Enter actual cost in "Fert Cost" tab. Application cost not included.*