November 29, 2012

Office of Environmental Assessment
Attn: Carol Harrison
U.S. EPA, Region 10
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Seattle, WA 98101

RE: Lower Yakima Valley Nitrate Study

To Whom It May Concern:

I submit these comments on behalf of N3 Consulting. We are an Agricultural Environmental consulting company specializing in Dairy Nutrient Management. We have over 100 dairy clients in Washington State and several of these are in the Yakima Valley. These comments are based on your report: *Relation Between Nitrate in Water Wells and Potential Sources in the Lower Yakima Valley, Washington*.

Our clients are keen to ensure that their impact on the greater environment are minimized wherever possible, ultimately this boils down to three goals: Pollution represents a loss from the system and often avoiding the losses can involve a saving elsewhere in the system; Dairymen are generally long term residents in the counties and communities in which they farm, they are good neighbours and don't like to be branded otherwise; and the cleanup of pollution and the regulation of it can consume a lot of time and energy .

Dairy farmers are the most closely monitored farmers in Washington state, they are the only ones required to have nutrient management plans by the government and they are the only ones who have regular government inspections. They all have Nutrient Management Plans, often written by, but always approved by the government as meeting your required standards. In order to have these plans Approved and Certified the dairies often had to invest heavily (hundreds of millions of dollars in the state) in structures and management techniques, this is usually done with the help of government engineers and often incorporated government cost share. Ultimately the diaries are the sector of farming that has the most contact with and oversight by you, the government. It seems ludicrous therefore that you, the government should come out with a report that ultimately says that you the government have failed in advising and overseeing the dairies and therefore protecting the ground water. I'm sure that all of your fellow "civil servants" (WSDA, DOE, NRCS, CD's and WSU) will be almost as appalled as we, the tax payers, are. If the protective measures recommended and certified by our government representatives are not sufficiently protective of the environment, then the dairies want to know. The Washington State Dairy farmers have been given rules to follow and are doing so in the good faith that you know what you are doing.

The report states: *"lack of complete well information limits our ability to verify if the wells upgradient and downgradient of the sources draw water from the same water bearing zone."* Surely this is crucial to the investigation and without this any comparison of contamination levels is tenuous at best. In fact it seems that there is very little upgradient water information at all. Admittedly there are a limited number of wells to select from in the area above the dairies but statistical significance requires more than the two questionable wells you have selected.

One of our greatest concerns is the lack of any focused attempt to determine the age of the water. This area has a relatively short history of land use. During that time there have been sweeping changes in the cropping and management of the farmland. Most notably are the changes in relative value of commercial fertilizer to marketable crops. As this ratio has increased, so the use of commercial fertilizer has decreased dramatically in all crops.

The state introduced Dairy nutrient management legislation in 1998 and since then sweeping changes have been made on all the dairies in the state, and particularly the dairies in the study, to bring them into line with government recommendations. I see nothing in your study that references this or even suggests that these changes may have already produced the required water quality improvements. This is of particular concern when the limited aging data you give claims the water variously as 16 to 40 years old and possibly older than 45 years. Anyone who is involved closely with the workings of any of the dairies you have included in your study (and your various government agents have been) will be aware of the massive changes that have occurred on these facilities often at great cost to the dairymen. In particular the escalating commercial fertilizer prices have made manure and composted manure solids valuable commodities in Eastern Washington which has led to huge exports of manure from the larger dairies to crop farmers often dozens of miles away. On one of the dairies included in your study there is now a removal of over ten million gallons of manure and over 2000 tons of composted manure solids which equates to more than 260,000 lbs of nitrogen removed per year. I saw only a cursory note to this in your report. To not give reference to this is inexcusable and shows a blinkered approach on behalf of your researchers.

The report findings indicate that more information is needed for onsite septic systems, wells and cropland fields as well as the dairies. Perhaps this is a good point to work from. The study in fact proves nothing we didn't already know. There is contamination of some drinking water wells and we don't know where it is coming from. The study hypothesizes that the dairy farms are the source of this contamination but has not produced any evidence that scientifically proves that their hypothesis is true.

The study area has a large number of homes that have onsite septic systems. Onsite Septic studies we have been privy to in Skagit and Whatcom counties have shown between 8 and 26 percent of septic systems to be failing in some form. Since the study area is a similar rural area with a similar, if not older, housing profile, would it not be fair to assume a similar level of failure. Yakima County Department of Health will undoubtedly have some data on the performance of the 22,000 OSS and this could have been included in the report.

On page 34 of your study you say EPA knows of no state requirements for lagoons to meet a standard yet Washington state law requires every Dairy to have an approved farm plan and approval of that plan requires the lagoons to meet NRCS standards.

Soils and Crops

Soils and crop investigations were laughably pathetic. I'm sorry, but this is an area of particular expertise to ourselves and we, the dairy industry, are expected to account for and balance the nutrients applied to our cropland. This is not detailed in your report and neither is the fact that the dairies are the ONLY farm type having to do this. Forage crops such as the Corn, Triticale and Alfalfa grown on the majority of dairy fields have massive nitrogen removal rates when compared with other

farm crops because the whole crop is removed rather than just the grain or fruit (400-500 lbs N/acre per year vs. <100 lbs/acre per year for most annual and orchard crops).

To take soil samples from cropland at a depth of only one inch defies just about every soil sampling protocol in existence. Crops draw their nutrients from the soil through their roots and most of the root mass is in the top three feet of soil. The top inch has almost no significance in this situation as it is the region of the soil where changes happen so rapidly, changes occur from day to day due to both climate (precipitation and temperature) and management actions (cultivation, fertilization, irrigation) and crop growth (both uptake and release). Soil samples in the top foot of soil have been shown to vary in nitrate from week to week by as much as 15ppm, and the top inch of soil is by far the most reactive of the foot. Nitrate in the top inch is often high as this is the area to which most cropland fertilizer is applied, surface feeder roots will absorb some of this, the remainder will be washed deeper down into the soil where it can be accessed by the main root mass. In order for cropland nitrate to have an impact on groundwater it must pass through the root zone unabsorbed by the crop and soil biotia. Soils below the root zone have not been sampled and as a result nothing has been gained from the sampling.

Sampling soils from only two fields of each of Corn, Hops and Mint gives very little information for a study of 300+ pages. Considering that we budget on 20+ fields sampled per man-day during our sampling season (with 30 cores to 12 inches taken per field) then the expenditure of more than the three man-hours it would have taken you to sample these six fields would have produced some results that would at least have been statistically significant.

That being said, nitrate and ammonia are the only leachable forms of nitrate and on the Haak Dairy the levels are equivalent to only 22lbs of N per acre (less than a tenth of the nitrate requirement of a corn crop). At the DeRuyter dairy levels of 247ppm in the top inch still only relate to 74lbs of N per acre (less than a third of the needs of a corn crop). As a crop consultant, I would say that these levels of nutrition in the top inch are within the range I would like to see in a corn or triticale field.

Your manure sampling protocol seems equally flawed. Manure is constantly changing as it is collected and stored. The biology of a manure lagoon is a complicated, ill-understood subject, but what is known is that the only relevant sampling for crop and soil nutrition is of the manure as it is moved out of the lagoon for land application. Manure is often separated before the liquid enters storage and, on larger dairies, wastewater often enters the lagoon from multiple sources in multiple directions. None of this seems to have been considered during your manure sampling.

Your consideration (page 47) of “fecal contamination” of the samples in the manure lagoon is ridiculous. The whole purpose of the lagoons is to store fecal matter. How can it be considered contamination if the purpose of the lagoon is to store it the “contaminant”? This use of language is inflammatory.

On page 11 of your report you state that some of the dairies use “synthetic fertilizer”. It seems that this comment was not investigated further. Utilizing synthetic fertilizer is common practice on many dairies as crop yield is limited by the most limiting nutrient. Often the well timed application of a small amount of fertilizer, even a micronutrient, can have a huge impact on crop yield and therefore overall nutrient harvest by the crop. This is particularly the case for Corn which needs phosphate in the early stages of growth (first six weeks) but is almost entirely incapable of absorbing phosphorus from the soil until it establishes its symbiotic relationship with soil fungi. In this case a small application of

phosphorus with the seed will help the crop establish and allow greater uptake of phosphorus from the field.

In Conclusion

Peer review is essential for a study of this scope. Within the government agencies there reside enough experts in the varying sciences to present valid input, there also is the background science to make a study like this truly effective. NRCS have based their lagoon designs and best management practice on sound science yet none of this is referred too, indeed the fact that they were not included in the

The language used in the report is inflammatory and this and the focus of the report highlights the bias to implicate dairymen rather than truly study the problem in order to seek a long term solution that assures both security of food supply and environmental protection. It is disappointing that so little peer review was asked for during the timescale of the study, there are so many steps that could have been improved upon and resulted in a study that was valid and sound. Now you feel unable to allow this document to receive true peer review, but as a government agency I can understand why you would not want to place yourself under that level of ridicule. Perhaps the solution in future is to conduct your explorations of groundwater with a more scientific and professional approach. To think that this document came from the same US government that put men on the moon and split the atom…. How the mighty have fallen.

Thank you for the opportunity to comment and we look forward to answering any questions EPA may have.