

MANITOBA CLEAN ENVIRONMENT COMMISSION
Hog Production Industry Review
Public Hearing – March 14, 2007

Presentation by Alf Poetker, P. Eng. C.E.

Mr. Chairman, members of the panel, ladies and gentlemen. My name is Alf Poetker. I am a professional engineer with primary experience in water and wastewater treatment, waste management and environmental services. My experience in waste management provided me the opportunity in the 1990's to become involved with large livestock operations. Specifically, with the onset of more rigorous manure management regulations, the requirement for professional services in obtaining approvals for various facilities became commonplace.

I grew up on a typical family farm in southwestern Manitoba. It included grain and forage production, a beef cattle operation, a modest dairy, poultry for meat and eggs, and a small hog operation. In keeping with the common practices of the day, livestock was pastured or otherwise free-roaming outdoors in the summer and confined to barns in the winter. Manure was manually removed from the barns on a daily basis and hauled to a nearby manure pile. Mixed with snow, the manure pile became fairly high by the spring, shrinking considerably every year as the snow melted and the water oozed out and drained away. Some manure was spread on nearby frozen fields from time to time.

Changing times brought changing practices. Cattle were housed in open barns allowing the manure to be built up with frequent addition of straw bedding. Manure was removed during the summer months and typically spread on the fields as a fertilizer resource. However, while undertaking a planning study for one of Manitoba's planning districts in the early 1980's, I observed an open housing barn and feedlot which was located in a sheltered ravine, next to the creek channel. Spring run-off regularly overtopped the channel and washed away much of the manure that accumulated over the winter. Another producer informed me that he had much the same convenient arrangement (though I did not observe his operation). At the same time, many pastured animals had their watering holes along the creeks and in sloughs or dugouts with connections to the creeks. This became a point of concentration for animal manure.

Again, times changed. The establishment of ever-larger livestock operations brought about a regulatory framework that began to address the management of such operations. Under the Manitoba Planning Act, which underwent a major change in 1976, large livestock operations within an established Planning District were typically a Conditional Use. This meant that a public hearing was required at which the Planning Board heard representations from the producer and from affected citizens and then set certain conditions for the operation. This would be in addition to the normal limitations imposed by the Zoning Bylaw. The Planning Board would often seek advice from a Technical Advisory Committee made up of representative from various Government Departments. In order to assist producers and regulators alike, a series of comprehensive guidebooks for livestock production and manure management was developed, to include hog, poultry and cattle production. Participants in the preparation of these guidebooks included people from government departments, municipal associations, citizen groups and livestock production and marketing organizations. The

guidebooks assisted producers in developing sound practices in the management of their operations and assisted authorities having jurisdiction in evaluating and approving Conditional Use applications.

The evolution of the regulatory framework together with the increasing cost of inputs into livestock production resulted in producers becoming more strategic in the management of their operations. In 1994, the Province of Manitoba introduced a major change to the Livestock Waste Regulation. Manitoba Regulation 81/94 introduced a number of requirements for storage, transport and application of manure to land. Setbacks and limits were prescribed. And any operation greater than 400 Animal Units in size was required to obtain a permit for storage and disposal of manure. The permits imposed further environmental requirements. In 1998 the Province introduced the Livestock Manure and Mortalities Management Regulation. It incorporated and expanded on many of the features of the Livestock Waste Regulation which it replaced. In its tone and language, it treated manure as a resource rather than as a “waste”. Producers with operations greater than 400 Animal Units were required to file annual Manure Management Plans in advance of applying manure to agricultural land. Such plan was to provide details as required by Manitoba Conservation so that the director could be satisfied that the application of manure would not cause pollution of surface water, groundwater or soil; and that no manure would escape from the boundary of the agricultural operation. The Regulation introduced a prohibition on winter spreading, thereby requiring most large producers to build new storage facilities. Such facilities required a permit, which for the most part introduced the need for professional services to ensure that the storage was designed and built to securely store the manure for an extended period of time.

Another major change was to limit the amount of nitrogen applied per acre of land. This often required the producers to apply the manure over a larger area than had been used in the past. It required an investment in equipment to transport the manure over greater distances, offset, in part, by a reduction in the need for commercial fertilizers. Producers are also typically innovative. Borrowing an idea from the irrigators, they began to install pipelines into their fields so as to pump the liquid manure directly from storage to pivot outlets in the fields. Connected to tillage equipment via high-pressure hoses, it is possible to inject the manure directly into the soil. This minimizes the odour and maximizes the nutrients which get bound up with the soil. With modern GPS and GIS technology, it also enables the producer to manage the nutrients to the needs of the soil and the specific crops which are planned for that field.

In 2003 the Director introduced a number of additional requirements via a Directive which required the use of professional engineers for design and certification of manure pumping systems, storage facilities and distribution pipelines. A major amendment to Regulation 42/98 was introduced in 2004, which incorporated these additions and provided more detail and rigor to the categories of manure management in the Regulation. It also introduced a timetable whereby these requirements would apply to livestock operations greater than 300 Animal Units (down from 400).

In 2006, Regulation 42/98 was again amended, now providing a timetable for the management and limitation of applying phosphorus to land. Again, producers have been pro-active, anticipating this change. Management of phosphorus is already

underway. It includes genetic research and development into livestock to reduce phosphorus in manure, development of feeds with lower phosphorus yields and crop selection and rotation to better utilize phosphorus in the soil. I believe this regulation now provides an effective tool to limit the development of large livestock operations where there is an inadequate land base for the spreading of manure.

Crop production and land tillage practices have changed significantly over the years. Fifty years ago, many producers would fallow their fields one year in three, or even every second year. Repeated cultivation to control weeds resulted in leaving the soil vulnerable to wind and water erosion. Similarly, the practice of straw burning was more common at that time, removing the trash from the soil and promoting erosion. Since phosphorus is typically bound up with the soil and is mobile in particulate form, this practice provided the opportunity for phosphorus to be carried by wind and water into the rivers and lakes.

At various times, opinion has shifted from believing that nitrogen is the main cause of algal proliferation in our waterways to believing that phosphorus is the controlling factor. For now, it appears that phosphorus is winning the battle for our urgent attention. And the sudden discovery of major algal development in the Lake Winnipeg North basin has triggered a sense of urgency if not panic to deal with the problem. My guess is that these algae have been flourishing for some time and that we have Google Earth to thank for the graphic display that has brought it to wider public attention.

I believe that the problem of massive algal blooms is not the result of the recent proliferation of large hog operations in Manitoba. Opinions vary on the percentage of responsibility which the hog industry has on this problem: from a low of one percent (which, I understand, approximates the percentage of phosphorus which this industry generates) to a much higher percentage which represents the opinion of some as to the relative mobility of phosphorus from this industry. I believe that in the past, notwithstanding a smaller industry, the opportunity for phosphorus movement into our waterways from former management practices and lack of regulation, has contributed to the concentration of nutrients in Lake Winnipeg. But let's not forget all the other contributors who, by some estimates contribute up to 99% of the phosphorus to the Lake. Fifty years ago when producers typically concentrated manure in leaching manure piles, the towns and cities of our province typically provided only token treatment of their wastewater. And phosphates in detergents were considered to be a marvelous way to get our laundry fresh and clean. Today, we see what that did to our lakes.

But nature is wonderfully resilient. I believe we sometimes give ourselves too much credit in terms of our ability to change things at the macro level. In last Sunday's Winnipeg Free Press, it was reported that a prominent national politician visiting the city claimed that we could save Lake Winnipeg by simply changing the name of our Prime Minister in the next federal election.

I'm afraid that won't do it. And I'm not politically partisan, one way or another. I do believe that the current level of responsible management of livestock operations and the strategic application of manure to the fields will have a long-term, beneficial effect on our environment going forward. But it won't happen overnight. And the producers can't

do it alone. It requires patience and partnership. It will take time for Lake Winnipeg to heal itself as we manage our own environment in a responsible and sustainable way. We need the partnership of our cities as they work together with other levels of government to reduce their contribution of nutrients which are often discharged directly into the water environment. And we absolutely need the participation of our neighbors to the south, to the east and to the west. Federal and Provincial Governments help cities in the financing of their wastewater facilities. I appeal to those governments to also assist producers in the financing and development of costly infrastructure in order to manage livestock manure in the manner required by the regulations.

A few quick takes if I may as I conclude. The 2006 amendment to Regulation 42/98 gives authority for the temporary suspension of permits for hog manure storage facilities while the Clean Environment Commission undertakes this review. A notable exception to the suspension is the development of facilities acceptable to the director for providing anaerobic digestion of manure. When I inquired about the details I was informed that they would be systems used to produce methane for the generation of electricity. Coincidentally, last Friday, the Winnipeg Free Press reported on a pair of Ontario farmers who won a \$50,000 award for the development of an anaerobic digester for manure from their dairy farm. The methane from the digester is used to run a generator for about 14 hours per day, reportedly saving the operation almost \$2,500 per month in their electricity bill. Unfortunately, the article told only half of the story. What it did not mention is the cost of developing and running the digester and generator. After factoring in capital amortization, debt servicing, maintenance and operation and equipment replacement costs, the electricity cost savings may be largely or totally offset. A pilot study into the generation of methane from hog manure, conducted at the University of Manitoba's Glenlea farm by graduate students in the 1970's, found that the energy inputs exceeded the energy outputs – and that did not even account for the cost of the equipment. So as a word of caution, Manitoba may be well positioned as a province of water power and wind power. Hog power is not likely to follow any time soon.

Last fall I attended a technical conference of the Canadian Water Resources Association, held in Winnipeg. The topics of water quality, Lake Winnipeg and phosphorus control predominated. The latter covered phosphorus from urban and industrial wastewater, from agriculture and natural areas. I was looking for some answers as to the mechanics of phosphorus movement from agricultural fields to our lakes, especially given the soil, fertilizer and crop management practices of today. Unfortunately, it seems that research in this area is very limited. The Government of Manitoba is prepared to spend money on this review by the Clean Environment Commission. They are prepared to impose the moratorium, which represents a cost to the industry. I would suggest that some focussed research and consultation with the industry on the management of phosphorus and the identification of the mechanisms and extent of its movement from fields to water courses would serve both the industry and the province to the betterment of the environment for us all. Thank you.