

ADDENDUM

TO THE

1995
CODE OF PRACTICE

FOR THE SAFE AND ECONOMIC HANDLING
OF ANIMAL MANURE
MAY 3, 1999

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Introduction

This document updates the following sections of the 1995 *Code of Practice for the Safe and Economic Handling of Animal Manures*.

Section 2

The definition of an Intensive Livestock Operation (ILO) has been rewritten to clarify the three criteria used to qualify an ILO. These criteria being: threshold size, density of confinement, and confinement time.

Section 3

This section has been updated and several new clauses added to clarify former areas of ambiguity and confusion.

Appendices

Appendix A: Values have been updated. Phosphorus and potassium are expressed in elemental forms.

Appendix B: Several new categories have been added in keeping with changes in the industry.

Appendix C: These tables have been simplified and updated with new categories in keeping with changes in the industry.

Appendix D: Several new Minimum Distance Separation category tables have been added.

This addendum supercedes the corresponding sections of the 1995 *Code of Practice for the Safe and Economic Handling of Animal Manures*.

Section 3

Livestock Facility Siting Guidelines

Minimum Distance Separation (MDS) Method

Separation between intensive livestock facilities and neighbours can compensate for normal odour production, thereby reducing potential nuisance conflicts. The MDS applies reciprocally for the siting of either the odour source (intensive livestock operation) and/or the neighbouring landowner (neighbour). The MDS method is based on Livestock Siting Units (LSUs) which considers site specific factors such as livestock type, manure production, and manure handling system.

Application of MDS

MDS provides a consistent and uniform technique for assessing the conflict potential of a land use or development change.

3.1 Application of MDS for Non-agricultural Developments

MDS provides a recommended minimum separation distance between new or expanding non-agricultural developments (residential, commercial, or recreational) and existing intensive livestock facilities.

3.2 Application of MDS for Agricultural Developments

MDS provides a recommended minimum separation distance between new intensive livestock developments, the expansion of existing intensive livestock operations, and neighbouring land uses. Where expansion to existing facilities is involved, the MDS may be applied in either of two ways:

- MDS may be applied to the existing portion of an expanding operation. In such case the expansion factor (**Appendix C-2**) is applied.
- MDS may be applied to the expanding portion of an existing intensive livestock operation. In such case the MDS is based on the total LSUs of the operation as if it was entirely new (no expansion factor applied) but the measurement is applied to the expanded portion of the development. Changes in management may be required for the existing portion of the facility to bring it into compliance with present standards.

3.3 MDS Tables

MDS distances have been pre-calculated into tabular form to simplify their use (**Appendix D**). In no case shall the MDS be less than 500 feet (150 metres). Distance is determined as follows:

3.3.1 Intensive Livestock Facility to a Neighbouring Residence

Measure the distance from the neighbouring residence (not property line) to the developing livestock facility at the point nearest the neighbouring residence. The livestock facility, for the purpose of determining MDS, is considered to be that part of the operation confining the livestock. The manure storage is considered part of the

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Appendix A-1: Nutrient Content of Typical Agricultural Livestock Manures for Various Species

Type of Livestock	Moisture %	Total N % Range	Total N - Typical			Available N			Crop N			Total P			Total K		
			%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne	%	lbs/ton	kg/tonne
Beef	Open	30 - 70 (50)	1.00	200	10.0	0.26	5.1	2.6	6.5	3.2	0.24	4.8	2.4	0.67	13.3	6.7	
	Paved	50 - 75 (65)	0.70	140	7.0	0.27	5.4	2.7	5.0	2.5	0.09	1.7	0.9	0.38	7.5	3.8	
Dairy	Free stall	85 - 95 (92)	0.40	8.0	4.0	0.18	3.6	1.8	3.3	1.7	0.09	1.7	0.9	0.42	8.3	4.2	
	Tie stall	70 - 85 (80)	0.50	10.0	5.0	0.21	4.2	2.1	3.8	1.9	0.09	1.7	0.9	0.42	8.3	4.2	
Hogs		90 - 99 (96)	0.35	7.0	3.5	0.16	3.2	1.6	3.1	1.6	0.11	2.2	1.1	0.17	3.3	1.7	
	Layers (solid)	50 - 70 (60)	1.60	32.0	16.0	1.31	24.6	12.3	21.5	10.8	1.22	24.3	12.2	0.83	16.7	8.4	
Poultry	Layers (liquid)	85 - 95 (90)	0.96	19.2	9.6	0.77	14.8	7.4	12.9	6.5	0.73	14.6	7.3	0.50	10.0	5.0	
	Broilers	30 - 50 (35)	1.85	37.0	18.6	1.23	24.7	12.4	21.4	10.7	0.65	13.0	6.5	0.83	16.7	8.4	
	Breeders	30 - 50 (35)	1.96	39.2	19.7	1.31	26.1	13.1	22.6	11.4	1.30	26.1	13.1	0.83	16.7	8.4	
	Turkeys	30 - 50 (35)	1.85	37.0	18.6	1.23	24.7	12.4	21.4	10.7	0.65	13.0	6.5	0.83	16.7	8.4	
Horses	.....	.....	0.60	12.0	6.0	0.30	6.0	3.0	5.7	2.9	0.13	2.6	1.3	0.50	10.0	5.0
Mink	.....	.....	1.80	36.0	18.0	0.90	18.0	9.0	17.1	8.6	1.09	21.7	10.9	1.67	33.3	16.7
Fox	.....	.....	0.40	8.0	4.0	0.20	4.0	2.0	3.8	1.9	0.09	1.7	0.9	0.08	1.7	0.8
Rabbit	.....	.....	0.50	10.0	5.0	0.21	4.2	2.1	4.6	2.3	0.52	10.4	5.2	0.42	8.3	4.2
Veal	.....	.....	0.38	7.6	3.8	0.19	3.8	1.9	4.0	2.0	0.22	4.3	2.2	0.31	6.2	3.1
Elk	.....	.....	0.65	13.0	6.5	0.20	3.9	2.0	4.5	2.2	0.22	4.3	2.2	0.50	10.0	5.0
Bison	.....	.....	0.65	13.0	6.5	0.20	3.9	2.0	4.5	2.2	0.22	4.3	2.2	0.50	10.0	5.0
Sheep	30 - 65 (50)	.....	0.70	14.0	7.0	0.28	5.6	2.8	5.3	2.7	0.20	3.9	2.0	1.04	20.8	10.4

Appendix B-2: Solid Manure Production Volume

Species		Daily			Monthly			Yearly		
		lbs	kgs	cu. ft.	lbs	kgs	cu. ft.	tons	tonnes	cu. ft.
Beef	Open lot	13	5.9	0.32	390	180	9.6	2.4	2.1	117
	Paved	20	9.0	0.43	590	270	12.8	3.6	3.2	156
Dairy	Tie stall	150	69	2.88	4540	2060	86.4	27.6	25.1	1050
Poultry	per 100 layers	9	4.0	0.41	264	120	12.3	1.6	1.4	149
	per 100 broilers	6.6	3.0	0.36	198	90	10.7	1.2	1.1	130
	per 100 breeders	16	7.2	0.64	480	220	19.2	2.9	2.6	234
	per 100 Turkey hens	32	14.3	1.46	950	430	43.7	5.8	5.1	532
	per 100 Turkey toms	36	16.5	1.67	1090	490	50.1	6.6	5.9	610
	per 100 Turkey broilers	26	11.6	1.03	770	350	30.9	4.7	4.2	376
Horses		46	21	0.92	1370	620	27.7	8.4	7.5	337
Mink	per 100	31	14.0	0.71	920	420	21.3	5.6	5.0	260
Fox	per 100	77	35	1.24	2310	1050	37.3	14.1	12.5	454
Rabbit	per 100	100	45	2.49	3000	1370	74.7	18.3	16.3	908
Veal		12	5.4	0.19	360	160	5.8	2.2	1.9	70
Elk		5.8	2.6	0.14	170	80	4.3	1.1	0.9	52
Bison		7.3	3.3	0.18	220	100	5.3	1.3	1.2	65
Sheep	Ewes	3.1	1.4	0.10	90	40	3.0	0.6	0.5	36
	Feeders	0.6	0.3	0.02	17	7	0.5	0.1	0.1	6

Appendix D

Minimum Distance Separation Tables

Explanation of Appendix D:

- Category 1:** Low sensitivity siting (e.g. single residence).
- Category 2:** Moderate sensitivity siting (e.g. multi-parcel country residential, low use recreational, etc.).
- Category 3:** High sensitivity siting (e.g. large scale country residential development, high use recreational, etc.).
- Category 4:** From boundary of rural hamlet, village, or residential zoning.

Appendix D-1: Recommended MDS (ft) for Beef Feeders

No. of Animals	Category 1	Category 2	Category 3	Category 4	No. of Animals	Category 1	Category 2	Category 3	Category 4
400	800	1070	1340	2160	4000	1870	2490	3110	4970
500	870	1160	1460	2330	5000	2020	2700	3370	5400
600	930	1240	1560	2480	6000	2160	2880	3600	5770
700	990	1320	1660	2630	7000	2290	3060	3810	6100
800	1040	1380	1730	2760	8000	2400	3200	4000	6410
900	1080	1440	1800	2890	9000	2510	3340	4180	6690
1000	1120	1500	1870	3000	10000	2610	3470	4340	6950
1200	1200	1600	2000	3210	12000	2790	3710	4640	7430
1400	1270	1700	2120	3390	14000	2960	3930	4810	7860
1600	1340	1780	2230	3560	16000	3090	4120	5160	8260
1800	1390	1860	2320	3720	18000	3230	4310	5380	8610
2000	1460	1930	2410	3860	20000	3360	4480	5690	8960
2500	1570	2090	2620	4190	25000	3640	4860	6070	9710
3000	1680	2240	2800	4480	30000	3890	5190	6490	10380
3500	1780	2370	2960	4740	40000	4320	5760	7200	11630
4000	1870	2490	3110	4970	50000	4690	6250	7820	12600

* Beef animals in the 450 - 900 lb (200 - 400 kg) weight range.

Appendix D-4: Recommended MDS (ft) for Hogs - Farrow to Wean (Early)*

No. of Sows	Category 1	Category 2	Category 3	Category 4	No. of Sows	Category 1	Category 2	Category 3	Category 4
100	770	1030	1280	2050	500	1380	1850	2310	3700
125	840	1110	1390	2230	600	1480	1980	2470	3950
150	890	1190	1490	2380	750	1610	2140	2680	4290
175	940	1260	1570	2520	1000	1780	2380	2970	4760
200	990	1320	1650	2650	1500	2070	2760	3450	5520
250	1080	1430	1790	2870	2000	2300	3060	3830	6130
300	1150	1530	1920	3070	2500	2490	3330	4160	6650
350	1220	1620	2030	3240	3000	2670	3550	4440	7110
400	1280	1700	2130	3410	3500	2820	3760	4700	7520
500	1390	1850	2310	3700	4000	2960	3950	4930	7890

* Piggery raising hogs from birth to about 18 days. Size based on farrowing sow herd and all associated hogs.

Appendix D-5: Recommended MDS (ft) for Hogs - Farrow to Wean (Standard)*

No. of Sows	Category 1	Category 2	Category 3	Category 4	No. of Sows	Category 1	Category 2	Category 3	Category 4
100	840	1120	1400	2230	500	1510	2010	2510	4020
125	910	1210	1510	2420	600	1610	2150	2680	4290
150	970	1290	1620	2590	750	1750	2330	2910	4660
175	1030	1370	1710	2740	1000	1940	2590	3230	5170
200	1060	1440	1800	2870	1500	2250	3000	3750	6000
250	1170	1560	1950	3120	2000	2500	3330	4160	6660
300	1250	1670	2080	3330	2500	2710	3610	4520	7230
350	1320	1760	2200	3530	3000	2900	3860	4830	7730
400	1390	1850	2310	3700	3500	3060	4090	5110	8170
500	1510	2010	2510	4020	4000	3220	4290	5360	8580

* Piggery raising hogs from birth to about 21 days. Size based on farrowing sow herd and all associated hogs.

Appendix D-8: Recommended MDS (ft) for Dairies*

No. of Milking Cows	Category 1	Category 2	Category 3	Category 4	No. of Milking Cows	Category 1	Category 2	Category 3	Category 4
80	720	960	1210	1930	300	1170	1560	1960	3120
100	780	1050	1310	2090	350	1240	1650	2070	3300
120	840	1120	1400	2240	400	1300	1730	2170	3470
140	890	1180	1480	2370	450	1360	1810	2260	3620
160	930	1240	1550	2480	500	1410	1880	2350	3760
180	970	1300	1620	2590	550	1460	1950	2440	3900
200	1010	1350	1680	2690	600	1510	2010	2510	4020
225	1050	1410	1760	2810	700	1600	2130	2660	4260
250	1100	1460	1830	2920	800	1680	2230	2790	4470
275	1130	1510	1890	3030	900	1750	2330	2920	4660
300	1170	1560	1950	3120	1000	1820	2420	3030	4850

* Size based on lactating cows but includes all associated animals and replacement stock. Full year confinement.

Appendix D-9: Recommended MDS (ft) for Poultry Layer Operations

No. of Birds	Category 1	Category 2	Category 3	Category 4	No. of Birds	Category 1	Category 2	Category 3	Category 4
5000	680	910	1140	1820	12000	910	1210	1520	2430
6000	720	970	1210	1930	15000	980	1310	1630	2610
7000	760	1020	1270	2030	20000	1080	1440	1800	2870
8000	800	1060	1330	2120	30000	1230	1640	2050	3280
9000	830	1100	1380	2210	50000	1460	1940	2430	3890
10000	860	1140	1430	2290	75000	1670	2220	2780	4440
12000	910	1210	1520	2430	100000	1830	2440	3050	4890

Appendix D-10: Recommended MDS (ft) for Poultry Broiler Operations

No. of Birds	Category 1	Category 2	Category 3	Category 4	No. of Birds	Category 1	Category 2	Category 3	Category 4
10000	500	520	650	1040	40000	620	820	1030	1640
15000	500	590	740	1190	50000	660	880	1100	1770
20000	500	650	820	1310	75000	760	1010	1260	2020
25000	530	700	880	1410	100000	830	1110	1390	2220
30000	560	750	930	1490	250000	1130	1500	1880	3000
35000	590	790	980	1570	500000	1420	1890	2360	3780
40000	620	820	1030	1640	1000000	1780	2370	2970	4750

Appendix D-11: MDS Table (ft) for Livestock Facility Developments Based on Livestock Siting Units (LSUs) (continued)

LSU	Category 1	Category 2	Category 3	Category 4	LSU	Category 1	Category 2	Category 3	Category 4
820	1570	2090	2610	4180	2050	2190	2920	3650	5840
840	1580	2110	2640	4220	2100	2210	2950	3680	5890
860	1600	2130	2660	4250	2150	2230	2970	3710	5940
880	1610	2140	2680	4290	2200	2250	3000	3750	5990
900	1620	2160	2700	4330	2250	2270	3020	3780	6040
920	1630	2180	2720	4360	2300	2280	3050	3810	6090
940	1650	2200	2750	4390	2350	2300	3070	3840	6140
960	1660	2210	2770	4430	2400	2320	3090	3870	6190
980	1670	2230	2790	4460	2450	2340	3120	3900	6230
1000	1690	2250	2810	4490	2500	2350	3140	3920	6280
1025	1700	2270	2830	4540	2550	2370	3160	3950	6330
1050	1720	2290	2860	4580	2600	2390	3190	3980	6370
1075	1730	2310	2880	4610	2650	2410	3210	4010	6410
1100	1750	2330	2910	4650	2700	2420	3230	4040	6460
1125	1760	2350	2930	4690	2750	2440	3250	4060	6500
1150	1770	2360	2960	4730	2800	2450	3270	4090	6540
1175	1790	2380	2980	4770	2850	2470	3290	4120	6590
1200	1800	2400	3000	4800	2900	2490	3310	4140	6630
1250	1830	2440	3050	4880	2950	2500	3340	4170	6670
1300	1850	2470	3090	4950	3000	2520	3360	4190	6710
1350	1880	2510	3130	5010	3100	2550	3400	4250	6790
1400	1910	2540	3180	5080	3200	2580	3440	4290	6870
1450	1930	2570	3220	5150	3300	2610	3470	4340	6950
1500	1950	2610	3260	5210	3400	2630	3510	4390	7030
1550	1980	2640	3300	5270	3500	2660	3550	4440	7100
1600	2000	2670	3330	5340	3600	2690	3590	4480	7170
1650	2020	2700	3370	5400	3700	2720	3620	4530	7250
1700	2050	2730	3410	5460	3800	2740	3660	4570	7320
1750	2070	2760	3450	5510	3900	2770	3690	4620	7390
1800	2090	2790	3480	5570	4000	2800	3730	4660	7450
1850	2110	2810	3520	5630	4100	2820	3760	4700	7520
1900	2130	2840	3550	5680	4200	2850	3790	4740	7590
1950	2150	2870	3580	5740	4300	2870	3830	4780	7650
2000	2170	2890	3620	5790	4400	2890	3860	4820	7720

Appendix D-11: MDS Table (ft) for Livestock Facility Developments Based on Livestock Siting Units (LSUs) (continued)

LSU	Category 1	Category 2	Category 3	Category 4	LSU	Category 1	Category 2	Category 3	Category 4
29000	5760	7680	9600	15360	38000	6360	8480	10600	16960
29500	5800	7730	9660	15460	39000	6420	8560	10700	17120
30000	5830	7780	9720	15550	40000	6480	8640	10800	17280
31000	5900	7870	9840	15740	41000	6540	8720	10900	17430
32000	5970	7960	9950	15920	42000	6590	8790	10990	17590
33000	6040	8050	10070	16100	43000	6650	8870	11090	17740
34000	6110	8140	10180	16280	44000	6710	8940	11180	17890
35000	6170	8230	10280	16450	45000	6760	9020	11270	18030
36000	6230	8310	10390	16620	46000	6820	9090	11360	18180
37000	6300	8400	10490	16790	47000	6870	9160	11450	18320