UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

APR 0 4 2007

REPLY TO THE ATTENTION OF:
WN-16J

Robert J. Boggs, Director
Ohio Department of Agriculture
8995 East Main Street
Reynoldsburg, Ohio 43068-3399

Dear Mr. Boggs:

I am writing in response to a December 28, 2006, letter from former Governor Taft in which the State of Ohio asked the United States Environmental Protection Agency (U.S. EPA), Region 5, to approve a revision to the Ohio National Pollutant Discharge Elimination System (NPDES) program. As you know, this revision involves a transfer of the program element for concentrated animal feeding operations (CAFOs) from the Ohio Environmental Protection Agency (Ohio EPA) to the Ohio Department of Agriculture (ODA). It includes amendments to Ohio's statutory and regulatory framework for preventing water pollution from CAFO manure, litter, and process wastewater.

We are committed to working with ODA to process this request as expeditiously as possible, and to resolve any deficiencies. As part of our review, we have identified an initial list of questions and concerns about the revised program (enclosed). The questions and concerns are focused on land application of manure and wastewater issues. They were briefly noted in a December 19, 2006, letter from this office to Mr. Kevin Elder of ODA and Mr. George Elmaraghy of Ohio EPA. These initial concerns must be resolved, or they may prevent U.S. EPA, Region 5, from approving the revised program. Please respond to the initial questions in writing, so that we can better understand ODA's land application standards. We may identify additional questions and concerns as our review progresses.

Thank you in advance for your responses. We will contact Mr. Elder to continue discussions in an effort to resolve the concerns. A meeting, such as the one requested in your March 20, 2007, letter to Regional Administrator Mary A. Gade, will also provide an opportunity for our two agencies to resolve concerns. I anticipate that we will respond to your March 20, 2007, letter in the near future.

Thank you for the opportunity to review the Ohio revised program. Do not hesitate to contact me if you have any questions.

Sincerely yours,

Jo Lynn Traub
Director, Water Division

Enclosure

cc: Chris Korleski, Director, Ohio EPA
Mr. Kevin Elder, ODA
Mr. George Elmaraghy, Ohio EPA

Enclosure

Questions

1. The Effluent Limitations Guidelines and New Source Performance Standards for the concentrated animal feeding operations (CAFO) point source category, 40 CFR part 412, prohibit dry-weather discharges of manure, litter, and process wastewater (manure) from land application areas under the control Large CAFOs in the cattle, swine, poultry, and veal subcategories. *See*: 71 *Federal Register* 37769, June 30, 2006. Does chapter 903 of the Ohio Revised Code or chapter 901 of the Ohio Administrative Code require National Pollutant Discharge Elimination System (NPDES) permits to be issued by the Ohio Department of Agriculture (ODA) to prohibit discharges from land application areas when such discharges are not agricultural storm water as defined in rule 901:10-1-01(D)?

2. Rule 901:10-2-14(C)(1)(d) provides that the rate of liquid manure application shall not exceed the available water capacity as described in appendix B of rule 901:10-2-14. When soil moisture is at or above field capacity, appendix B does not identify liquid amounts required to reach the available water capacity. Does rule 901:10-2-14(C)(1)(d) prohibit liquid manure application when soil moisture equals or exceeds field capacity?

3. Rule 901:10-2-14(C)(1)(e) requires CAFO owners or operators to adjust the application rate for liquid manure to avoid surface ponding and/or runoff. Rule 901: 10-2-14(G)(1)(c) allows owners or operators to apply 5,000 gallons (gal) of liquid manure on an acre of frozen ground. When ground is frozen but not covered with snow, which rule governs for the purpose of limiting the rate at which liquid manure may be applied?

4. Rule 901:10-2-14(C)(3) provides that land application of manure shall comply with all restrictions in appendix A of rule 901:10-2-14 unless a compliance alternative is submitted in the manure management plan and approved by the director. Does the allowance for compliance alternatives extend only to the setbacks in appendix A, table 2, of rule 901:10-2-14 or does it extend to all of the best management practices in appendix A of rule 901:10-2-14?

5. The federal regulation at 40 CFR § 412.4(c)(5) contains a 100-foot setback applicable to manure application near conduits to surface water[1]. Ohio rule 901:10-2-14(C)(3) (incorporating appendix A, table 2, by reference) does not expressly incorporate a setback applicable to conduits to surface water. However, it does incorporate a setback applicable to surface waters of the State. Are roadside ditches included within the meaning of the term surface waters of the State as that term is used in rule 901:10-2-14 (C)(3)?

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[1] As compliance alternatives, the regulation provides that a CAFO owner or operator may substitute a 35-foot vegetative buffer or demonstrate that a setback or buffer is not necessary because conservation practices or field conditions provide pollutant reductions equivalent to or better than a 100-foot setback.

6. Rule 901:10-2-14(C)(3) (incorporating appendix A, table 2, by reference) contains a 35-foot setback applicable to surface application of manure near field surface furrows. Rule 901:10-1-01 defines a field surface furrow as "an area of ... concentrated surface water runoff [that] ... is not a river, stream, ditch, or grassed waterway. Field surface furrows are areas that are normally planted with crops each year." A December 22, 2006, memorandum from Kevin Elder to Jo Lynn Traub indicates that such furrows are "derived from the [Ohio] Natural Resources Conservation Service (NRCS) Conservation Practice Standard 607, which was developed to be used predominantly in Northwest Ohio to remove standing water from crops during the growing season. The systems are usually made up of small, temporary lateral surface furrows that convey water to main surface drains (collectors)." Has Ohio NRCS or Ohio State University published criteria applicable to the design and construction of field surface furrows? If so, please provide a copy of the published criteria. If not, please provide ODA's design and construction criteria if they exist.

7. Rule 901:10-2-14(D)(2)(b) requires the owner or operator to subtract the nitrogen credit for crop residue, legumes, and other sources of nitrogen to be given to the next corn crop. Are credits from prior applications of manure included within the meaning of "other sources of nitrogen" as these words are used in rule 901:10-2-14(D)(2)(b)? Please see 68 *Federal Register* 7211, February 12, 2003.

8. Rule 901:10-2-14(D)(2)(b) expressly requires the owner or operator to subtract credits to be given to the next corn crop. Does it or any other rule require the owner or operator to subtract credits to be given to the next crop other than corn? If a rule other than rule 901:10-2-14(D)(2)(b) requires credits to be given to the next crop other than corn, please identify the rule.

9. Rule 901:10-2-14(D)(5) provides that the criteria applicable to manure application and the requirements of paragraph (D) of rule 901:10-2-14 may be changed if the owner or operator can demonstrate nutrient insufficiency to the director. Do the words "criteria applicable to manure application," as used in paragraph (D)(5) of rule 901:10-2-14, refer to all of the criteria in rule 901:10-2-14 or only the criteria in rule 901:10-2-14(D)(1) through (4)?

10. Rule 901:10-2-14(E)(3)(b) provides that application of phosphorus shall not occur on land with soil tests over 150 parts per million (ppm) Bray P1 or equivalent unless an owner or operator can demonstrate an alternative to the director through use of the phosphorus index risk assessment procedure contained in appendix E, table 1, of rule 901:10-2-14. Are all such alternative applications subject to the applicable prohibition or limitation in the *Generalized Interpretation of Phosphorus Index & Management* column in appendix E, table, 1, of rule 901:10-2-14?

11. Rule 901:10-2-14(E)(3)(c) provides that phosphorus applications between 250 and 500 pounds (lbs) per acre may be made if the values for liquid manure exceed 60 lbs per 1,000 gal and if the values for solid manure exceed 80 lbs per ton. Is the allowance in

rule 901:10-2-14(E)(3)(c) subject to any more stringent nitrogen limitation derived under rule 901:10-2-14(D)?

12. Rule 901:10-2-14(E)(3)(b) provides that an owner or operator shall not apply phosphorus on land with soil tests over 150 ppm Bray P1 or equivalent unless the owner or operator can demonstrate an alternative through use of the Ohio phosphorus index procedure. However, rule 901:10-2-14(E)(3)(d) provides that, "[N]otwithstanding the procedures in paragraph (E)(3)(a) or (E)(3)(b) of this rule ..., for a single phosphorus application in a year, the application rate shall not exceed five hundred pounds per acre of phosphorus." Are manure applications conducted in accordance with rule 901: 10-2-14(E)(3)(d) subject to any more stringent prohibition or limitation derived under rule 901:10-2-14(E)(3) or rule 901:10-2-14(E)(3)(b)?

13. Rule 901:10-2-14(G)(1)(a) provides that prior approval for surface application of manure on frozen or snow-covered ground shall be obtained from the director or his or her representative. On what basis will the director or his or her representative grant or deny such approval?

14. Rules 901:10-2-14(G)(1)(b) and (c) provide that the rate of application on frozen or snow-covered ground is limited as follows: 10 tons per acre (solid manure with more than 50 percent moisture), five tons per acre (solid manure with less than 50 percent moisture), and 5,000 gal per acre (liquid manure). The limitations in these rules are not expressed in units of time. Will ODA determine compliance with the limitations during each discrete period of time during which ground is frozen or snow-covered or will ODA determine compliance on a cumulative basis for all periods in a winter during which ground is frozen or snow-covered? For example, if a winter includes three periods during which ground is frozen or snow-covered, could an owner or operator apply 5,000 gal of liquid manure per acre during each period, for a cumulative rate of 15,000 gal per acre, or would he or she be limited to 5,000 gal per acre in total?

Concerns

1. The federal regulation at 40 CFR § 412.4(c)(5) contains a setback applicable to manure application near downgradient open tile line intake structures. Ohio rule 901: 10-2-14(C)(3) (incorporating appendix A, table 2, by reference) does not contain a setback applicable to such structures.

2. The regulation at 40 CFR § 412.4(c)(5) contains a 100-foot setback applicable to manure application near downgradient conduits to surface water. As compliance alternatives, the regulation provides that a CAFO owner or operator may substitute a 35-foot vegetative buffer or demonstrate that a setback or buffer is not necessary because conservation practices or field conditions provide pollutant reductions equivalent to or better than a 100-foot setback. Ohio rule 901:10-2-14(C)(3) (incorporating appendix A, table 2, by reference) contains a 35-foot setback applicable to surface application near field surface furrows. In a December 22, 2006, memorandum from Kevin Elder to

Jo Lynn Traub, ODA contends that the 35-foot setback is a compliance alternative as allowed under the federal regulations. ODA has not provided data and information that a CAFO owner or operator could use to demonstrate that ODA's 35-foot setback provides pollutant reductions equivalent to or better than a 100-foot setback.

3. Rule 901:10-2-14(E)(3) requires CAFO owners and operators to land apply no more manure than allowed in appendix E, table 2. When the phosphorus soil test level is between 100 and 150 ppm Bray P1 or equivalent, Appendix E, table 2, provides that manure shall be applied so as not to exceed the nitrogen requirement or removal for the next crop. It also provides that a single application of the manure phosphorus required by crops to be planted over several years is authorized provided that the field has more than 50 percent ground cover at the time of application or the manure is incorporated within seven days.

According to the Ohio NRCS (2001) and Ohio Environmental Protection Agency (Ohio EPA) (2005), a high potential for phosphorus transport to surface water exists when a CAFO owner or operator uses a soil test to assess the risk of transport and the results show 100 or more ppm of phosphorus in the soil. ODA agreed with Ohio NRCS and Ohio EPA on this point before 2007 (*see*: Ohio Administrative Code 901:10-2-14, appendix E, table 2 (2006)).

Application of manure in excess of crop nutrient requirements increases the pollutant runoff from fields because the crop does not need these nutrients. In areas that have high phosphorus buildup in soil, allowing application at a nitrogen-based rate or multi-year phosphorus-based rate could allow continued discharge of phosphorus. U.S. EPA recognizes that inherent site conditions, conservation practices, and management practices may, in aggregate, reduce field vulnerability to phosphorus transport to surface water. While the Ohio phosphorus index accounts for all of the relevant potentially mitigating conditions and practices, appendix E, table 2 (2007), does not. When soil test phosphorus levels are high (i.e., between 101 and 150 ppm inclusive in the present instance), U.S. EPA, Region 5, is concerned that the appendix E, table 2 (2007), allowance for application at a nitrogen-based rate or multi-year phosphorus-based rate will not minimize phosphorus movement to surface waters as required under 40 CFR § 123.36.

4. Rule 901:10-2-14(C)(6) provides that the owner or operator shall not land apply manure if the forecast predicts a greater than 50 percent chance of more than one-half inch of rain for a period extending to 24 hours after the start of an intended land application event.

U.S. EPA, Region 5, evaluated this Ohio rule to determine whether it will prevent precipitation-related discharges when rain is forecast to occur within 24 hours after an intended manure surface application event. Such an evaluation is supported by 40 CFR § 123.36 (requiring technical standards for nutrient management to address, in part, the timing of land application to minimize nutrient movement to surface waters) and section 4.1.2.4 of the *NPDES Permit Writers' Guidance Manual and Example NPDES Permit for*

Concentrated Animal Feeding Operations (U.S. EPA 2003) (providing that technical standards for nutrient management should prohibit surface application when rain is expected soon after a planned application in an amount that may produce runoff). It is consistent with the Ohio NRCS Conservation Practice Standard for Nutrient Management (2003) (providing that CAFO owners and operators should delay manure application if precipitation capable of producing runoff is forecast within 24 hours of the planned application).

We prepared the attached tables as part of the evaluation. The tables are based on NRCS (1997, 1986) and Soil Conservation Service (SCS) (1972). Procedures in these references account for soil moisture before a rainfall event of interest. The moisture categories are dry (antecedent moisture condition (AMC) I), average (AMC II), and saturated (AMC III). For the purpose of our evaluation, we assumed that CAFO owners and operators will refrain from surface applying solid manure when soil moisture is classified as AMC III, due to possible trafficability problems. With regard to surface application of liquid manure when soil is saturated, we assumed that ODA will answer question 2., above, in the affirmative (i.e., answer that rule 901:10-2-14(C)(1)(d) prohibits liquid manure application when soil moisture is at or above field capacity).

As indicated in the tables, the precipitation amount in the Ohio rule should prevent almost all near-term precipitation-related discharges when soil moisture before a likely rainfall event is classified as AMC I. It should prevent many near-term precipitation-related discharges when soil moisture before a likely event is classified as AMC II and the predominant soil within the land application area is classified as hydrologic soil group (HSG) A or B. However, the precipitation amount in the Ohio rule is not likely to prevent most near-term precipitation-related discharges when soil moisture before a likely event is classified as AMC II and the predominant soil within the land application area is classified as HSG C or D. This is a cause for concern in as much as such discharges may kill fish or otherwise adversely affect surface water quality but nevertheless qualify for the permit shield under 33 U.S.C. § 1342(k) or the agricultural storm water discharge exclusion under 33 U.S.C. § 1362(14) and Ohio rule 901:10-2-14.

A December 22, 2006, memorandum from Kevin Elder to Jo Lynn Traub does not allay this concern. In it, ODA said that it need not include a rainfall amount less than one-half inch for HSG C and D soils under AMC II principally because (1) Ohio rule 901: 10-2-14(C)(1)(d) limits applications of liquid manure to the amount which will increase soil moisture to the available moisture capacity and (2) several variables determine whether precipitation will cause runoff. U.S. EPA, Region 5, does not agree that Ohio rule 901:10-2-14(C)(1)(d) will prevent a discharge from a HSG C or D soil in the event of near-term precipitation less than one-half inch. As it is, a likely outcome of a liquid manure application in compliance with rule 901:10-2-14(C)(1)(d) would be to increase soil moisture from AMC I or II to AMC III. As indicated in the attachment, as little as 0.22 or 0.15 inch of rain is required to produce runoff from HSG C or D soils, respectively, when soil moisture before the event is classified as AMC III and dense residue or canopy cover is present. Separately, we note that NRCS (1997, 1986) and SCS (1972) account for most of the variables which are relevant to determining whether rain

will cause runoff. The variables include soil type, the presence or absence of subsurface drains, cover type, and treatment practices (including residue management).
(The NRCS/SCS references do not account for the effect of soil temperature on runoff generation.)

Attachment

References

Natural Resources Conservation Service. 1997. *National Engineering Handbook, Part 630, Hydrology*. United States Department of Agriculture. Washington, D.C.

Natural Resources Conservation Service. 1986. *Urban Hydrology for Small Watersheds.* Technical Release 55. United States Department of Agriculture. Washington, D.C.

Ohio Environmental Protection Agency. 2005. *General Permit Authorization for Concentrated Animal Feeding Operations under the National Pollutant Discharge Elimination System.* NPDES Permit No.: OHA000001. Columbus, Ohio.

Ohio Natural Resources Conservation Service. 2001. *Ohio Field Office Technical Guide, Section I, Nitrogen and Phosphorus Risk Assessment Procedures.* Columbus, Ohio.

Ohio Natural Resources Conservation Service. 2003. *Nutrient Management.* Conservation Practice Standard 590. Columbus, Ohio

Soil Conservation Service. 1972. *National Engineering Handbook, Section 4, Hydrology*. United States Department of Agriculture. Washington, D.C.

United States Environmental Protection Agency. 2003. *NPDES Permit Writers' Guidance Manual and Example NPDES Permit for Concentrated Animal Feeding Operations*. EPA-833-B-04-001. Washington, D.C.

MINIMUM RAIN OR OTHER LIQUID REQUIRED TO PRODUCE RUNOFF[1]

Fallow + Residue Cover (< 20 Percent)

		Rain or Other Liquid (inches (in.))		
HSG[2]	CN[3]	AMC[4] I	AMC II	AMC III
A	76	1.45	0.63	0.25
B	85	0.86	0.35	0.13
C	90	0.56	0.22	0.08
D	93	0.41	0.15	0.04

Fallow + Residue Cover (≥ 20 Percent)

		Rain or Other Liquid (in.)		
HSG	CN	AMC I	AMC II	AMC III
A	74	1.64	0.70	0.27
B	83	0.98	0.41	0.15
C	88	0.67	0.27	0.11
D	90	0.56	0.22	0.08

Fallow (former crop row crop) + Residue Cover (67 Percent)[5] or Row Crop Midway Between Planting and Harvest

		Rain or Other Liquid (in.)		
HSG	CN	AMC I	AMC II	AMC III
A	67	2.26	0.98	0.41
B	78	1.33	0.56	0.22
C	85	0.86	0.35	0.13
D	89	0.63	0.25	0.08

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[1] Derived from: (1) Natural Resources Conservation Service (NRCS). 1997. *National Engineering Handbook, Part 630: Hydrology*, chapters 9 and 10. United States Department of Agriculture (USDA). Washington D.C.; (2) NRCS. 1986. *Urban Hydrology for Small Watersheds*. Technical Release 55. USDA. Washington, D.C.; and (3) Soil Conservation Service. 1972. *National Engineering Handbook, Section 4, Hydrology*. USDA. Washington, D.C.

[2] Hydrologic soil group.

[3] Curve number.

[4] Antecedent moisture condition.

[5] Assumes that average CNs for row crops in straight rows apply when residue covers 67 percent of the soil surface in the time between fall harvest and spring planting. USDA, NRCS, (1997), p. 10.15.

Fallow (former crop small grain) + Residue Cover (67 Percent)[6] or Small Grain Crop Midway Between Planting and Harvest

		Rain or Other Liquid (in.)		
HSG	CN	AMC I	AMC II	AMC III
A	63	2.64	1.17	0.50
B	75	1.51	0.67	0.27
C	83	0.98	0.41	0.15
D	87	0.74	0.30	0.11

Fallow (former crop close-seeded or broadcast legumes) + Residue Cover (67 Percent)[7] or Close-seeded or Broadcast Legumes Midway Between Planting and Harvest

		Rain or Other Liquid (in.)		
HSG	CN	AMC I	AMC II	AMC III
A	58	3.26	1.45	0.63
B	72	1.77	0.78	0.33
C	81	1.12	0.47	0.17
D	85	0.86	0.35	0.13

Fallow (former crop row crop) + Residue Cover (> 90 Percent)[8] or Row Crop at Peak Growth

		Rain or Other Liquid (in.)		
HSG	CN	AMC I	AMC II	AMC III
A	60	3.00	1.33	0.56
B	73	1.70	0.74	0.30
C	82	1.03	0.44	0.17
D	88	0.67	0.27	0.11

[6] Assumes that average CNs for small grain crops in straight rows apply when residue covers 67 percent of the soil surface in the time between fall harvest and spring planting. USDA, NRCS, (1997), p. 10.15.

[7] Assumes that average CNs for close-seeded or broadcast legume crops in straight rows apply when residue covers 67 percent of the soil surface in the time between fall harvest and spring planting. USDA, NRCS, (1997), p. 10.15.

[8] Assumes that normal peak growth CNs for row crops in straight rows apply when residue covers practically all of the soil surface in the time between fall harvest and spring planting. USDA, NRCS, (1997), pp. 10.14 and 10.15.

Fallow (former crop small grain) + Residue Cover (> 90 Percent)[9] or Small Grain at Peak Growth

		Rain or Other Liquid (in.)		
HSG	**CN**	**AMC I**	**AMC II**	**AMC III**
A	52	4.24	1.85	0.82
B	67	2.26	0.98	0.41
C	78	1.33	0.56	0.22
D	84	0.94	0.38	0.15

Fallow (former crop close-seeded or broadcast legumes) + Residue Cover (> 90 Percent)[10] or Close-seeded or Broadcast Legumes at Peak Growth

		Rain or Other Liquid (in.)		
HSG	**CN**	**AMC I**	**AMC II**	**AMC III**
A	42	6.00	2.76	1.23
B	61	2.88	1.28	0.56
C	74	1.64	0.70	0.27
D	80	1.17	0.50	0.20

[9] Assumes that normal peak growth CNs for small grain crops in straight rows apply when residue covers practically all of the soil surface in the time between fall harvest and spring planting. USDA, NRCS, (1997), pp. 10.14 and 10.15.

[10] Assumes that normal peak growth CNs for close-seeded or broadcast legume crops in straight rows apply when residue covers practically all of the soil surface in the time between fall harvest and spring planting. USDA, NRCS, (1997), pp. 10.14 and 10.15.