

**PERMITTING PROCEDURES  
FOR DETERMINING  
“REASONABLE POTENTIAL”**

**Natural Resources and  
Environmental Protection Cabinet**



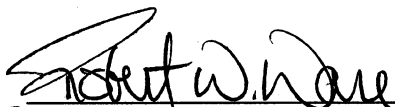
**Kentucky Division of Water  
Frankfort, Kentucky**

**May 1, 2000**

List of Contributors

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These procedures have been approved for release:

for   
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Jack A. Wilson, Director  
Division of Water

6-14-00  
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Date

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# REASONABLE POTENTIAL PROCEDURES

## SECTION I. Regulatory Requirements

Limitations shall control all pollutants or pollutant parameters (conventional, non-conventional, or toxic) which the Cabinet determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any water quality standard, including narrative criteria for water quality.

When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a water quality standard, the Cabinet shall use procedures which account for existing controls on point and non-point sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing when evaluating whole effluent toxicity, and where appropriate, the dilution of the effluent in the receiving water.

Specifically, the review procedures to be used shall be in accordance with the "Kentucky DOW-KPDES Branch: Water Quality Computer Programs" document (June, 2000) as attached. Of particular note, the procedures outlined in Chapter 3: Toxic Pollutants, and Appendix G: Toxic Criteria Methodology, shall be the basis for technical evaluation of reasonable potential as discussed in the paragraph above. In addition, the procedures outlined in "Permitting Procedures for Discharges into Impaired Waters" (draft) shall be followed where a discharge is into an impaired waterbody.

## SECTION II. Setting Effluent Limits

### (a) Chemical Specific

When the Cabinet determines, using the review procedures, that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a numeric criteria within a water quality standard for an individual pollutant, the permit shall contain effluent limits for that pollutant.

### (b) In the Absence of a Water Quality Standard

If 401 KAR 5:031 does not specify a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has a reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable water quality standard, the Cabinet shall establish limits using one (1) or more of the following options:

1. Establish effluent limits using a calculated numeric water quality criterion for the pollutant which the Cabinet demonstrates will attain and maintain applicable water quality criteria and will fully protect the designated use. Such a criterion may be derived using administrative regulations interpreting the narrative water quality criterion, supplemented with other relevant information which may include: EPA's Water Quality Standards Handbook, risk assessment data, exposure data, information from the Food and Drug Administration, and current EPA criteria documents; or

2. Establish effluent limits on a case-by-case basis, using water quality criteria listed in 401 KAR 5:031, supplemented when necessary by other relevant information; or
3. Establish effluent limitations on an indicator parameter for the pollutant of concern if:
  - a. The permit identifies which pollutants are intended to be controlled by the use of the effluent;
  - b. The fact sheet sets forth the basis for the limit, including a finding that compliance with the effluent limit on the indicator parameter will result in controls on the pollutant of concern, which are sufficient to attain and maintain applicable water quality standards;
  - c. The permit requires all effluent and ambient monitoring necessary to show that during the term of the permit, the limit on the indicator parameter continues to attain and maintain applicable water quality standards; and
  - d. The permit contains a reopener clause allowing the Cabinet to modify or revoke and reissue the permit, if the limits on the indicator parameter no longer attain and maintain applicable water quality standards.

When developing water quality based effluent limits, the Cabinet shall ensure that:

1. The level of water quality to be achieved by limits on point sources is derived from and complies with all applicable water quality standards; and
2. Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation for the discharge prepared by the Cabinet.

Limitations shall control all toxic pollutants which:

1. The Cabinet determines, based on information reported in a permit application under 401 KAR 5:060, Section 2(7), or in a notification under 401 KAR 5:065, Section 1(15)(a), or other information, are or may be discharged at a level greater than the level which can be achieved by the technology-based treatment requirements (Best Professional Judgement – BPJ) appropriate to the permittee under 401 KAR 5:080, Section 1(2)(c); or
2. The discharger does or may use or manufacture as an intermediate or final product or by-product.

The requirement for control of toxic pollutants as set forth above shall be satisfied by:

1. Limitations on those pollutants; or
2. Limitations on other pollutants which, in the judgment of the Cabinet, will provide treatment of the pollutants of concern to the levels required by 401 KAR 5:080, Section 1(2)(c).

### **(c) Whole Effluent Toxicity**

When the Cabinet determines, using the review procedures, that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a numeric criterion for whole effluent toxicity, the permit shall contain limits for whole effluent toxicity.

Limits for whole effluent toxicity are not necessary where the Cabinet demonstrates in the fact sheet or statement of basis of the KPDES permit, using the aforementioned review procedures, that chemical-specific limits for the effluent are sufficient to attain and maintain applicable numeric and narrative water quality standards.

### **SECTION III. Chemical Specific Procedures**

1. Review the permit application for pollutants that will, or have reasonable potential to cause, or contribute to an excursion above any water quality criteria. Review of all municipal applications shall verify industrial user contribution and, for those municipalities with an approved pretreatment program, this review shall include toxic scans of influent, effluent, and sludge, audits, and inspection reports.
2. Limit any pollutant(s) given in an effluent guideline (in addition, water quality based limits may be applied as well; e.g. mass limitations calculated from the effluent guidelines and concentration limitations derived from water quality criteria).
3. Wasteload allocation shall be utilized as a method for determination of limits for pollutants that will, or have reasonable potential to cause, or contribute to an excursion above water quality criteria. The "Kentucky DOW-KPDES Branch: Water Quality Computer Programs" document (June, 2000) as attached shall be the basis for the determination with consideration of stream dilution, available discharge data, in-stream concentrations, and criteria for aquatic life (acute and chronic) and human health.
4. Limit any pollutant(s) based on Best Professional Judgement (BPJ). The basis for establishing these limitations will be included in the fact sheet or statement of basis of the permit.
5. Where reasonable potential does not exist, or sufficient data does not exist to make a determination, it may be desirable to require "monitor only" as an interim measure to provide for collection and evaluation of necessary data prior to the determination of an appropriate limitation. Sufficient data is five (5) or more data points.

6. Where a comparison of the data against the wasteload allocation reveals that a pollutant is present in the range of 70% - 90% of the wasteload allocation for that pollutant, then a monthly monitor and report requirement will be imposed for a one (1) year period. If this data reveals that the pollutant is present in an amount exceeding 90% of the wasteload allocation for that pollutant, then the effluent limit for that pollutant will become effective at that time. If this data reveals that the pollutant is present in the range of 70% - 90% of the wasteload allocations, then the monitor and report requirement will continue for the remainder of the permit duration and the limitation will be held in abeyance. If this data reveals that the pollutant is present in an amount less than 70% of the wasteload allocation, then the monitor and report requirement will cease.
7. A comparison of the data against the wasteload allocation will be performed in order to identify any pollutant(s), which will, or have a reasonable potential to cause, or contribute to, an excursion above any water quality criteria. The average of the available data will apply when comparing against chronic and human health criteria, while the maximum individual data point will apply when comparing against acute criteria. A limitation will be placed on any pollutant, which the data reveals is exceeding 90% of the wasteload allocation.

#### **SECTION IV. Whole Effluent Toxicity Procedures**

1. All complex effluents present a reasonable potential to cause, or contribute to in-stream toxicity. Complex effluents typically have a number of differing or variable wastestreams. These various wastestreams may act synergistically to cause toxicity. All designated major facilities, all municipalities with an approved pretreatment program, as well as other facilities (i.e., major industrials, etc.) with reasonable potential to discharge toxic pollutants, are required to conduct Whole Effluent Toxicity (WET) testing. The primary means of determining applicability of either the chronic or acute method is through the wasteload allocation method as outlined in the Kentucky DOW-KPDES Branch: Water Quality Computer Programs document (June, 2000) as attached.
2. Where some data may exist for an effluent previously having no WET testing requirements, that indicates some toxic effect(s), the data will be evaluated to determine whether to impose a WET limitation or only monitoring and reporting requirements. If the data indicating toxic effects pertains directly to the effluent, and sufficient data is available, then a WET limitation will be imposed. If the data pertains to in-stream effects for which there may be multiple causes, or sufficient data is not available to make a determination, then a quarterly monitor and report requirement will be imposed for one year.

3. For those cases where only monitoring and reporting is required, if after one year the data reveals that the effluent is not toxic (no effect using 100% effluent), then the requirement will cease. If the data reveals that the effluent is toxic, however it is toxic in an amount less than 70% to 90% of the applicable WET limitation, then the monitor and report requirement will continue for the remainder of the permit duration and the limitation held in abeyance. If the data reveals that the effluent is toxic in an amount greater than 90% of the applicable WET limitation, then the limitation will become effective at that time. The average of the data will be used when comparing against chronic toxicity units and the maximum will be used when comparing against acute toxicity units.
4. For cases in which acute toxicity is deemed appropriate, a limitation for acute toxicity is determined and test procedures included as a permit condition.
  - a. If noncompliance with the toxicity limit occurs, the permittee has the option of performing accelerated testing (four (4) tests within sixty (60) days) or performing a Toxicity Reduction Evaluation (TRE). Also, if the accelerated testing reveals significant noncompliance ( $\geq 1.2$  times the limit on any 2 of 6 tests), a TRE will be required.
  - b. If a TRE is required, a plan and implementation schedule must be submitted within thirty (30) days of notification. The TRE protocol shall follow that outlined in the most recent edition of the EPA TRE guidance manual.
5. For cases in which chronic toxicity is deemed appropriate, a chronic toxicity limit will be determined and the chronic test procedures included as a permit condition.
  - a. If noncompliance with the toxicity limit occurs, the permittee must conduct a second test within 15 days of the first failure. If this second test demonstrates noncompliance with the toxicity limitation, the permittee has the option of performing accelerated testing (four (4) tests within ninety (90) days) or performing a TRE. Also, if the accelerated testing reveals significant noncompliance ( $\geq 1.2$  times the limit on any 2 of 6 tests), a TRE will be required.
  - b. If a TRE is required, a plan and implementation schedule must be submitted within thirty (30) days of notification. The TRE protocol shall follow that outlined in the most recent edition of the EPA TRE guidance manual.

## **SECTION V. Specific Technical Issues**

There are a number of specific technical questions that are not addressed in the "Kentucky DOW-KPDES Branch: Water Quality Computer Programs" document (June, 2000) as attached. In order to address these issues, this section is intended to be presented in a question and answer format.

**Q1.** How will be agency handle single or multiple data points (chemical specific or WET) on applications, DMRs, or other sources of information as it relates to reasonable potential?

**A1.** In determining reasonable potential, the agency will assume any single data point to be representative of the discharge. While most effluents exhibit a lognormal distribution relative to concentrations of constituents being released, the agency has chosen not to assume any coefficient of variation for a data set (regardless of size). As such, a single data point shall be evaluated against what limits might be required ["Kentucky DOW-KPDES Branch: Water Quality Computer Programs" document (June, 2000)] as a direct comparison.

For multiple data points, the data shall be reviewed under one of two approaches. First, the data may be averaged and then compared to what the limit would need to be for that constituent in order to determine whether reasonable potential exists. In some instances, it may be necessary to discard a data outlier where it is readily apparent that the data point is not reflective of the discharge. Secondly, the reviewer may choose a single data point in determining reasonable potential. The later case is generally only done where a highly variable effluent exists and a high data point is deemed to be more reflective of the effluent.

See Section III of this document for further clarification on when an effluent limit or monitoring would be required.

In all cases, the fact sheet or statement of basis of the KPDES permit shall describe the basis for the permitting action taken.

**Q2.** How will background conditions (background concentrations, hardness, etc.) be factored into the reasonable potential evaluation?

**A2.** In the absence of any data in close proximity to the discharge, the reviewer will generally assume background levels of zero for use in the respective computations. ["Kentucky DOW-KPDES Branch: Water Quality Computer Programs" document (June, 2000)] Prior to making this assumption, a review of the all available data will be performed. This review will include, but not be limited to data available in STORET, data collected as a result of watershed studies, and other site-specific studies when available. As data becomes more readily available or is already available for the stream being discharged into (i.e., Watershed monitoring data, etc.), the reviewer shall use representative data in the respective computations. The resultant permit limits from this evaluation shall be compared to the data as discussed in A1 above for purposes of determining reasonable potential.

In all cases, the fact sheet or statement of basis of the KPDES permit shall describe the basis for the permitting action taken.

**Q3.** How will non-detectable or below detection limits data points be used in determining reasonable potential?

**A3.** Any data point that is reported as non-detectable or below detection limits shall be assigned a value of zero in evaluating reasonable potential.

**Q4.** How will reasonable potential be determined where no data is available?

**A4.** For new or expanded discharges, there will be instances where data is not available to reflect the characteristics of the discharge. In those instances, the reviewer must use their Best Professional Judgement (BPJ) to determine which, if any, constituents might exhibit a reasonable potential to exceed water quality standards. In addition, the procedures discussed in "Chemical Specific Procedures" and "Whole Effluent Toxicity Procedures" shall be followed in making this BPJ determination. Whether a limit or monitoring is required will be based upon the characteristics of the receiving stream (i.e., impaired waterbody, etc.) in addition to the potential for that parameter to be discharged.



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When the Cabinet determines, using the review procedures, that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a numeric criteria within a water quality standard for an individual pollutant, the permit shall contain effluent limits for that pollutant.

### (b) In the Absence of a Water Quality Standard

If 401 KAR 5:031 does not specify a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has a reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable water quality standard, the Cabinet shall establish limits using one (1) or more of the following options:

1. Establish effluent limits using a calculated numeric water quality criterion for the pollutant which the Cabinet demonstrates will attain and maintain applicable water quality criteria and will fully protect the designated use. Such a criterion may be derived using administrative regulations interpreting the narrative water quality criterion, supplemented with other relevant information which may include: EPA's Water Quality Standards Handbook, risk assessment data, exposure data, information from the Food and Drug Administration, and current EPA criteria documents; or

2. Establish effluent limits on a case-by-case basis, using water quality criteria listed in 401 KAR 5:031, supplemented when necessary by other relevant information; or
3. Establish effluent limitations on an indicator parameter for the pollutant of concern if:
  - a. The permit identifies which pollutants are intended to be controlled by the use of the effluent;
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The requirement for control of toxic pollutants as set forth above shall be satisfied by:

1. Limitations on those pollutants; or
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### **(c) Whole Effluent Toxicity**

When the Cabinet determines, using the review procedures, that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the allowable ambient concentration of a numeric criterion for whole effluent toxicity, the permit shall contain limits for whole effluent toxicity.

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6. Where a comparison of the data against the wasteload allocation reveals that a pollutant is present in the range of 70% - 90% of the wasteload allocation for that pollutant, then a monthly monitor and report requirement will be imposed for a one (1) year period. If this data reveals that the pollutant is present in an amount exceeding 90% of the wasteload allocation for that pollutant, then the effluent limit for that pollutant will become effective at that time. If this data reveals that the pollutant is present in the range of 70% - 90% of the wasteload allocations, then the monitor and report requirement will continue for the remainder of the permit duration and the limitation will be held in abeyance. If this data reveals that the pollutant is present in an amount less than 70% of the wasteload allocation, then the monitor and report requirement will cease.
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