

3745-65-93

Preparation, evaluation, and response.

(A) Before November 19, 1981, the owner or operator ~~must~~shall prepare an outline of a ground water quality assessment program. The outline ~~must~~shall describe a more comprehensive ground water monitoring program than that described in rules 3745-65-91 and 3745-65-92 of the Administrative Code, which ~~must~~shall be capable of determining the following:

- (1) Whether hazardous waste or hazardous waste constituents have entered the ground water~~;~~;
- (2) The rate and extent of migration of hazardous waste or hazardous waste constituents in the ground water~~;~~; ~~and~~,
- (3) The concentrations of hazardous waste or hazardous waste constituents in the ground water.

(B) For each indicator parameter specified in paragraph (B)(3) of rule 3745-65-92 of the Administrative Code, the owner or operator ~~must~~shall calculate the arithmetic mean and variance, based on at least four replicate measurements on each sample, for each well monitored in accordance with paragraph (D)(2) of rule 3745-65-92 of the Administrative Code, and compare these results with ~~its~~that parameter's initial background arithmetic mean. The comparison ~~must~~shall consider individually each of the wells in the monitoring system, and ~~must~~shall use the "Student's T-test" at the 0.01 level of significance (see the appendix to this rule) to determine statistically significant increases, and decreases in the case of pH, over initial background.

(C) Well comparison.

- (1) If the comparisons for the upgradient wells made under paragraph (B) of this rule show a significant increase, or pH decrease, the owner or operator ~~must~~shall submit this information in accordance with paragraph (A)(2)(b) of rule 3745-65-94 of the Administrative Code.
- (2) If the comparisons for downgradient wells made under paragraph (B) of this rule show a significant increase, or pH decrease, the owner or operator ~~must~~shall then immediately obtain additional ground water samples from those downgradient wells where a significant difference was detected, split the samples in two, and obtain analyses of all additional samples to determine whether the significant difference was a result of laboratory error.

(D) Analysis, notification, and plan.

- (1) If the analyses performed under paragraph (C)(2) of this rule confirm the significant increase, or pH decrease, the owner or operator ~~must~~shall provide written notice to the director, within seven days after the date of such confirmation, that the facility may be affecting ground water quality.
- (2) Within fifteen days after the notification under paragraph (D)(1) of this rule, the owner or operator ~~must~~shall develop and submit to the director a specific plan, based on the outline required under paragraph (A) of this rule and certified by a qualified geologist or geotechnical engineer, for a ground water quality assessment at the facility.
- (3) The plan to be submitted under paragraph (D)(1) of rule 3745-65-90 of the Administrative Code or paragraph (D)(2) of this rule ~~must~~shall specify the following:
 - (a) The number, location, and depth of wells;~~;~~
 - (b) Sampling and analytical methods for these hazardous wastes or hazardous waste constituents in the facility;~~;~~
 - (c) Evaluation procedures, including any use of previously gathered ground water quality information;~~and~~
 - (d) A schedule of implementation.
- (4) The owner or operator ~~must~~shall implement the ground water quality assessment plan which satisfies the requirements of paragraph (D)(3) of this rule, and, at a minimum, determine both:
 - (a) The rate and extent of migration of the hazardous waste or hazardous waste constituents in the ground water;~~and~~
 - (b) The concentrations of the hazardous waste or hazardous waste constituents in the ground water.
- (5) The owner or operator ~~must~~shall make ~~his~~the first determination under paragraph (D)(4) of this rule as soon as technically feasible, and, within fifteen days after that determination, submit to the director a written report containing an assessment of the ground water quality.

- (6) If the owner or operator determines, based on the results of the first determination under paragraph (D)(4) of this rule, that no hazardous waste or hazardous waste constituents from the facility have entered the ground water, then ~~he~~the owner or operator may reinstate the indicator evaluation program described in rule 3745-65-92 of the Administrative Code and paragraph (B) of this rule. If the owner or operator reinstates the indicator evaluation program, ~~he must~~the owner or operator shall so notify the director in the report submitted under paragraph (D)(5) of this rule.
- (7) If the owner or operator determines, based on the first determination under paragraph (D)(4) of this rule, that hazardous waste or hazardous waste constituents from the facility have entered the ground water, then ~~he~~the owner or operator:
- (a) ~~Must~~Shall continue to make the determinations required under paragraph (D)(4) of this rule on a quarterly basis until final closure of the facility, if the ground water quality assessment plan was implemented prior to final closure of the facility; or
 - (b) May cease to make the determinations required under paragraph (D)(4) of this rule, if the ground water quality assessment plan was implemented during the post-closure care period.
- (E) Notwithstanding any other provision in rules 3745-65-90 to 3745-65-94 of the Administrative Code, any ground water quality assessment to satisfy the requirements of paragraph (D)(4) of this rule which is initiated prior to final closure of the facility ~~must~~shall be completed and reported in accordance with paragraph (D)(5) of this rule.
- (F) Unless the ground water is monitored to satisfy the requirements of paragraph (D)(4) of this rule, at least annually the owner or operator ~~must~~shall evaluate the data on ground water surface elevations obtained under paragraph (E) of rule 3745-65-92 of the Administrative Code to determine whether the requirements under paragraph (A) of rule 3745-65-91 of the Administrative Code for locating the monitoring wells continues to be satisfied. If the evaluation shows that paragraph (A) of rule 3745-65-91 of the Administrative Code is no longer satisfied, the owner or operator ~~must~~shall immediately modify the number, location, or depth of the monitoring system into compliance with this requirement.

Effective: 03/24/2017

Five Year Review (FYR) Dates: 11/29/2016 and 11/29/2021

CERTIFIED ELECTRONICALLY

Certification

02/15/2017

Date

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Appendix to rule 3745-65-93 of the Administrative Code

Test for Significance

As required in paragraph (B) of rule 3745-65-93 of the Administrative Code, the owner or operator ~~must~~shall use the "Student's T-test" to determine statistically significant changes in the concentration or value of an indicator parameter in periodic ground water samples when compared to the initial background concentration or value of that indicator parameter. The comparison ~~must~~shall consider individually each of the wells in the monitoring system. For three of the indicator parameters (specific conductance, total organic carbon, and total organic halogen) a single-tailed "Student's T-test" ~~must~~shall be used to test at the 0.01 level of significance for significant increases over background. The difference test for pH ~~must~~shall be a two-tailed "Student's T-test" at the overall 0.01 level of significance.

The "Student's T-test" involves calculation of the value of a t-statistic for each comparison of the mean (average) concentration of value (based on a minimum of four replicate measurements) of an indicator parameter with ~~its~~that parameter's initial background concentration or value. The calculated value of the t-statistic ~~must~~shall be compared to the value of the t-statistic found in a table for t-test of significance at that specified level of significance. A calculated value of t which exceeds the value of t found in the table indicates a statistically significant change in the concentration or value of the indicator parameter.

Formulas for calculation of the t-statistic and tables for t-test of significance can be found in most introductory statistics texts.