*** DRAFT - NOT YET FILED ***

3745-30-01 **Definitions.**

As used in Chapter 3745-30 of the Administrative Code, the definitions contained in rule 3745-27-01 of the Administrative Code and the following definitions are applicable:

(A) "Foundry sand" means pure sand or a mixture of sand and any additives necessary for use of the sand in the foundry process, including dusts and sludges from air pollution control equipment exclusively dedicated to sand processing and handling, but not including such foundry process by-products as other air pollution control dusts or sludges, wastewater treatment plant sludge, or refractories.

(B) "Residual solid waste" or "residual waste" is a type of solid waste and means:

(1) The following wastes generated by fuel burning operations which are regulated by rule 3745-17-10 of the Administrative Code and which burn as fuel primarily coal: air pollution control wastes, water pollution control wastes, and other wastes with similar characteristics which are approved by the director or his authorized representative.

(2) The following wastes generated from foundry operations: air pollution control dust, wastewater treatment plant sludge, unspent foundry sand, spent foundry sand, and other foundry wastes with similar characteristics which are approved by the director or his authorized representative.

(3) The following wastes generated from pulp and papermaking operations: wastewater treatment plant sludges, lime mud, lime grit, sawdust, wood chips, bark, hydropulper rejects, and other pulp and papermaking wastes with similar characteristics which are approved by the director or his authorized representative.

(4) The following wastes generated from steelmaking operations: air pollution control dust, wastewater treatment plant sludges, dust from steel processing and finishing operations, water softening sludge, flux material, and other steelmaking wastes with similar characteristics which are approved by the director or his authorized representative.

(5) The following wastes generated from gypsum processing plant operations: gypsum wallboard waste, paper surface preparation dust, wastewater treatment plant sludge, and other gypsum processing wastes with similar characteristics which are approved by the director or his authorized representative.

(6) The following wastes generated from lime processing operations: air pollution control dust and/or sludge, and other lime processing wastes with similar

*** DRAFT - NOT YET FILED ***

characteristics which are approved by the director or his authorized representative.

(7) The following wastes generated from portland cement operations: air pollution control dust and other processing wastes with similar characteristics which are approved by the director or his authorized representative.

Residual wastes may be disposed in a licensed sanitary landfill facility without performance of the waste characterization and landfill classification specified in rules 3745-27-03 and 3745-27-04 of the Administrative Code, or in any licensed residual waste landfill facility provided that the class number for such a facility is not greater than the class number necessary for that residual waste as determined by the residual waste characterization and landfill classification in accordance with rules 3745-30-03 and 3745-30-04 of the Administrative Code.

(C) "Residual waste landfill facility" or "residual waste landfill" is a sanitary landfill facility where one or any combination of residual solid wastes specified in paragraph (B) of this rule are exclusively disposed. Nontoxic fly ash, nontoxic bottom ash, and nontoxic spent foundry sand may also be disposed of at a residual waste landfill facility. Residual waste landfill facilities include four classifications: class I, class II, class III, and class IV.

(D) "Spent" as used in spent foundry sand means any material that has been used and as a result of degradation or contamination can no longer serve the purpose for which it was produced without processing.

*** DRAFT - NOT YET FILED ***

3745-30-02 **Applicability.**

(A) Chapter 3745-30 of the Administrative Code is applicable only to a sanitary landfill facility which, in accordance with paragraph (C) of rule 3745-30-01 of the Administrative Code, may be deemed a residual waste landfill facility.

(B) Chapter 3745-30 of the Administrative Code is applicable to a facility originally permitted and licensed as a residual waste landfill facility after the effective date of this rule.

(C) The licensee of a facility as specified in paragraph (A) of this rule may submit to the director the residual waste identification information specified in paragraphs (C)(2)(a) and (C)(2)(b) of rule 3745-30-05 of the Administrative Code, and upon authorization of the director, the facility shall be licensed as a residual waste landfill facility, subject to the provisions of Chapter 3745-30 of the Administrative Code in lieu of rules 3745-27-01 to 3745-27-19 of the Administrative Code, except where those rules are referenced in Chapter 3745-30 of the Administrative Code.

(D) For the purpose of determining the applicability of the requirements of Chapter 3745-30 to a class I, class II, class III, or class IV residual waste landfill facility, the applicant, permittee, or licensee shall refer to the following:

(1) Paragraphs (B) and (C) of rule 3745-30-06 of the Administrative Code for siting criteria.

(2) Paragraph (E) of rule 3745-30-06 of the Administrative Code for the engineered components specified in paragraph (C) of rule 3745-30-07 of the Administrative Code.

(3) Paragraph (A) of rule 3745-30-08 of the Administrative Code for ground-water monitoring requirements.

(4) Paragraph (A) of rule 3745-30-09 of the Administrative Code for final closure/post-closure plan submittal requirements.

(5) Paragraph (A) of rule 3745-30-10 of the Administrative Code for post closure care requirements.

(6) Paragraph (A) of rules 3745-27-15, 3745-27-16, and 3745-27-18 of the Administrative Code for financial assurance requirements.

(7) Paragraph (A) of rule 3745-30-14 of the Administrative Code for operational requirements.

*** DRAFT - NOT YET FILED ***

(8) For a class IV residual waste landfill facility, the applicant, permittee, or licensee shall refer to paragraph (C) of rule 3745-30-04 of the Administrative Code.

(E) Ohio Administrative Code rules 3745-27-01, 3745-27-02, 3745-27-04, and 3745-27-05 apply to Chapter 3745-30 of the Administrative Code.

(F) Chapter 3745-30 of the Administrative Code shall not apply to spent foundry sand, fly ash, and bottom ash which has been determined to be nontoxic by the Ohio environmental protection agency, or to any facility which exclusively disposes of such wastes.

(G) Chapter 3745-30 of the Administrative Code shall not apply to the beneficial use of coal-combustion waste materials authorized under section 1513.02 of the Revised Code.

(H) Chapter 3745-30 of the Administrative Code shall not apply to the beneficial use of lime mining wastes authorized under section 1514.081 of the Revised Code.

*** DRAFT - NOT YET FILED ***

3745-30-03 **Residual waste characterization.**

(A) In order to determine and confirm the appropriate residual waste landfill class for disposal of wastes specified in rule 3745-30-01 of the Administrative Code, residual waste shall be sampled in accordance with paragraph (C) of this rule, and an extract shall be obtained and tested in accordance with paragraphs (D) and (E) of this rule for all of the following parameters unless an alternative list is used in accordance with paragraph (B) of this rule:

(1) For residual wastes generated by fuel burning operations as specified in paragraph (B)(1) of rule 3745-30-01 of the Administrative Code, parameter numbers one through eight, ten through fifteen, and forty of appendix I of rule 3745-30-04 of the Administrative Code.

(2) For residual wastes generated by foundry operations as specified in paragraph (B)(2) of rule 3745-30-01 of the Administrative Code, parameter numbers one through eighteen, twenty-two through twenty-four, thirty-two, thirty-five, thirty-six, and forty of appendix I of rule 3745-30-04 of the Administrative Code.

(3) For residual wastes generated by pulp and papermaking operations as specified in paragraph (B)(3) of rule 3745-30-01 of the Administrative Code, parameter numbers one through forty of appendix I of rule 3745-30-04 of the Administrative Code.

(4) For residual wastes generated by steelmaking operations as specified in paragraph (B)(4) of rule 3745-30-01 of the Administrative Code, parameter numbers one through seventeen and forty of appendix I of rule 3745-30-04 of the Administrative Code.

(5) For residual wastes generated from gypsum processing plant operations as specified in paragraph (B)(5) of rule 3745-30-01 of the Administrative Code, parameter numbers one through seventeen and forty of appendix I of rule 3745-30-04 of the Administrative Code.

(6) For residual wastes generated from lime processing operations as specified in paragraph (B)(6) of rule 3745-30-01 of the Administrative Code, parameter numbers one through six, eight, ten through fifteen, and forty of appendix I of rule 3745-30-04 of the Administrative Code.

(7) For residual wastes generated from portland cement operations as specified in paragraph (B)(7) of rule 3745-30-01 of the Administrative Code, parameter numbers one through seventeen and forty of appendix I of rule 3745-30-04 of the Administrative Code.

*** DRAFT - NOT YET FILED ***

(B) As an alternate to a parameter list prescribed in paragraph (A) of this rule, another parameter list may be used to characterize a residual waste in accordance with the following:

(1) For the purpose of determining the appropriate residual solid waste landfill class, parameters may be added or removed from the parameters listed in paragraph (A) of this rule if approved by the director.

(2) For the purpose of determining the appropriate residual solid waste landfill class, the director, based on process or material knowledge or previously acquired waste characterization data, may require the addition of a parameter(s) to the parameter list prescribed in paragraph (A) of this rule.

(3) For the purpose of confirming the residual solid waste is appropriate for the landfill class, compounds may be removed from the parameters listed in paragraph (A) of this rule when performing the waste characterization required by paragraph (G) of this rule if the waste characterization conducted in accordance with paragraphs (C) to (F) of this rule demonstrates that the parameter is either not present in the waste, or present at such low concentrations that the applicable maximum allowable concentration for the proposed residual waste landfill class will not be exceeded.

(C) All samples of a residual waste shall be composite samples of that residual waste as described in section 9.1.1.4.1. of USEPA's "Test Methods for Evaluating Solid Wastes" (SW-846), and the sampler shall employ all reasonable measures, such as sampling different sources of the residual waste at different times, or conducting random sampling of a representative pile of the residual waste generated by the same production processes using the same raw materials at different times, to ensure that representative composite samples are obtained. Wastes may be mixed or treated prior to collecting composite samples as long as one of the following criteria are met:

(1) The individual wastes are mixed prior to discharge in the normal production process of the generator or the individual wastes are generated by substantially similar industrial processes and raw materials.

(2) The mixing of individual wastes results in a waste in which leaching characteristics are reduced relative to one or more of the individual wastes due to attenuation factors other than dilution, such as precipitation, adsorption, or ion exchange and demonstrates all of the following:

(a) It is demonstrated to the satisfaction of the director that a reduction in

*** DRAFT - NOT YET FILED ***

leaching characteristics occurs in one or more parameters due to such a factor. The demonstration shall be submitted to Ohio EPA for approval and it shall include, at a minimum, all of the following:

(i) The concentration, determined in accordance with the waste characterization specified in paragraph (E) of this rule, of each parameter that undergoes a reduction in concentration due to such a factor and of each parameter with a concentration greater than fifty per cent of the maximum concentration for the proposed landfill class, for the following:

(a) Each individual waste in the mixture.

(b) The resultant mixture.

(ii) A listing and the ratio, by weight and volume, of the individual wastes which comprise the mixture.

(iii) Calculations using the concentration and weight data required by paragraphs (C)(2)(a)(i)(a), (C)(2)(a)(i)(b) and (C)(2)(a)(ii) of this rule, which demonstrate quantitatively that the reduction in leaching characteristics is not due solely to dilution.

(iv) An identification and explanation of the chemical reaction(s), including chemical equations, which causes the attenuation.

(b) The individual wastes are mixed in the same ratios and in the same manner in which they will be mixed prior to disposal during the normal operation of the residual waste landfill.

(3) A residual waste may be treated by aeration to reduce the concentration of phenol prior to the waste characterization performed in accordance with paragraph (D) of this rule provided that an aeration process is performed in the same manner and for the same duration on all similar residual waste prior to disposal in the residual waste landfill.

(D) The toxicity characteristic leaching procedure (TCLP) (USEPA method 1311) shall be used to obtain all extracts for the purpose of characterizing a residual waste proposed for disposal in a residual waste landfill. For a leaching solution to obtain the extract, the applicant or permittee may use either the acid solution specified in the TCLP or the water solution specified in the ASTM water leaching method

*** DRAFT - NOT YET FILED ***

(ASTM D 3987-85). The acid and water solutions may each be used for specific parameters as appropriate to utilize characterization knowledge from other testing, such as hazardous waste determination. The solution chosen for a parameter in the initial characterization of a residual waste shall be used for that parameter in all subsequent characterizations of that residual waste. For the purpose of obtaining an extract which will be analyzed for any of the volatile organic compounds listed in appendix I of rule 3745-30-04 of the Administrative Code, a zero headspace extraction (ZHE) apparatus, as specified in the TCLP, shall be used. Laboratory analytical methods for determining the concentration of the parameters required by paragraph (A) of this rule in an extract shall use all of the following:

(1) Methods specified in the most recent edition of USEPA's "test methods for evaluating solid wastes" (SW-846) for the analysis of volatile organic compounds.

(2) Methods specified in "methods for chemical analysis of water and wastes" (EPA 600/4-79-020) for the analysis of total dissolved solids.

(3) Methods specified in either of the documents listed in paragraphs (D)(1) and (D)(2) of this rule for the analysis of arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, chloride, fluoride, iron, manganese, sodium, sulfate, cyanide, and phenols.

(E) To determine the appropriate residual waste landfill class for disposal of wastes, the concentration of all parameters required to be analyzed by paragraph (A) of this rule shall be determined using a minimum number of seven samples. Based on a high degree of variability in the concentration of a parameter at or near the maximum allowable concentration for a particular landfill class, the sampler, applicant, permittee, or the director may determine that more samples are required. The residual waste classification shall be performed in accordance with one of the following:

(1) All concentrations of all parameters required for analysis by paragraph (A) of this rule are less than seventy percent of the maximum allowable concentrations for the class.

(2) The upper limit of the eighty percent confidence interval of the mean of the concentration of each parameter required for analysis by paragraph (A) of this rule is below the maximum allowable concentration for the class. The statistical procedure for determining the eighty per cent confidence intervals shall be in accordance with appendix I this rule or with an alternative statistical procedure deemed acceptable by the director.

*** DRAFT - NOT YET FILED ***

(F) For purposes of determining the appropriate residual waste landfill class, actual leachate from previously disposed residual waste which is representative of long-term field leachate of the residual wastes proposed for future disposal may be substituted for the extract specified in paragraph (D) of this rule upon the written concurrence of the director. The director may allow alternate statistical procedures to those specified in paragraph (E) of this rule when actual leachate is used.

(G) To confirm the residual waste is appropriate for the landfill class as established by rule 3745-30-04 of the Administrative Code, after the effective date of a permit to install for a residual waste landfill, the permittee shall characterize each residual waste in accordance with the following:

(1) Within twelve months of the effective date of the permit, establish a confirmation sampling date by collecting one sample of each residual waste and characterizing it in accordance with paragraphs (A) to (D) of this rule. Based on a concentration of a parameter which exceeds the upper limit of the confidence interval calculated for that parameter in accordance with paragraph (E) of this rule, the sampler, applicant, permittee, or the director may determine that more samples are required.

(2) Annually, within forty-five days of the confirmation sampling date established in accordance with paragraph (G)(1) of this rule, or according to a more frequent schedule as established by the director based on variability noted in previous sampling events and/or other factors affecting the predictability of waste characteristics, collect one (or more) sample(s) of each residual waste and characterize it in accordance with paragraphs (A) to (D) of this rule.

(3) All characterization data shall be submitted to Ohio EPA within seventy-five days of sampling and include a general process flow diagram which displays the processes, points of generation, and types of wastes generated.

(4) If test results indicate that the maximum concentration for the previously established landfill class is exceeded, two test results from additional samples must be submitted within seventy-five additional days. Testing may be limited to the parameter in exceedence and any parameters with a concentration greater than fifty per cent of the maximum allowable concentration. Test results from two samples are required to reject the original exceedence. If the original exceedence is not rejected, the permittee may either submit to Ohio EPA a new waste characterization in accordance with paragraphs (A) to (E) of this rule, within seventy-five days, or submit a permit to install application for modification to future phases of the residual waste landfill to comply with the appropriate landfill class. If the permittee submits a new waste characterization, the director shall evaluate the

*** DRAFT - NOT YET FILED ***

characterization for landfill classification and may require that the permittee submit a permit to install application to modify the landfill to comply with a new class as appropriate. The director shall not apply the siting criteria specified in rule 3745-30-06 of the Administrative Code to such a permit to install application, but may require additional environmentally protective measures.

(5) Whenever the production process or raw materials used in the production process change significantly and/or new wastes are proposed for disposal in the residual waste landfill, characterize the waste in accordance with paragraphs (A) to (E) of this rule. For the purpose of this rule, to "change significantly" means that the change would be reasonably expected to alter the appropriate residual waste landfill classification as required in rule 3745-30-04 of the Administrative Code.

[Comment: The confirmation sampling date established pursuant to paragraph (G)(1) of this rule is the same date to be applied to new residual waste(s) approved for a facility.]

(H) All characterization data shall be submitted to the director accompanied by a completed chain of custody documentation. The chain of custody documentation shall be a field tracking report form to record sample custody in the field prior to and during shipment.

Appendix I

Statistical Procedure

The statistical procedure in this appendix shall be used to determine the 80% upper confidence intervals for the mean concentrations of waste characterization parameters, as required by paragraph (E) of this rule, for the test results obtained in accordance with paragraph (D) of this rule. For any set of concentration values for a parameter from independent samples of waste, the 80% upper confidence interval (CI) for the mean is as follows:

$$CI = \bar{x} + t_{.80}\, s_{\bar{x}}$$

Where:	$\bar{x}$	=	arithmetic mean of the concentration of the parameter,
	$t_{.80}$	=	"t" value taken from the table below,
	$s_{\bar{x}}$	=	estimate of the standard error of the mean of the concentration of the parameter, calculated as follows:

$$s_{\bar{x}} = \frac{s}{\sqrt{n}}$$

Where:	n	=	total number of samples of a waste analyzed for the parameter.
	s	=	estimate of the population standard deviation of the concentration of the parameter in a waste, calculated as follows:

$$s = \sqrt{\frac{\sum_{i=1}^{n} x_i^2}{n-1}}$$

Where:	x_i	=	concentration of the parameter determined for one sample of a waste.

Tabulated Values of Student's "$t_{.80}$"

Degrees of Freedom (n-1)*	Tabulated "$t_{.80}$" value**	Degrees of Freedom (n-1)*	Tabulated "$t_{.80}$" value**	Degrees of Freedom (n-1)*	Tabulated "$t_{.80}$" value**
6	1.440	11	1.363	16	1.337
7	1.415	12	1.356	17	1.333
8	1.397	13	1.350	18	1.330
9	1.383	14	1.345	19	1.328
10	1.372	15	1.341	20	1.325

* Degrees of freedom are equal to one less than the number of samples (n) tested for a waste.

** Tabulated "t" values are for a two-tailed confidence interval and a probability of 0.80 for the population mean being within the confidence interval. Additional degrees of freedom and associated "t" values can be found in standard statistical manuals when calculating the upper confidence limit with more than seven samples.

The sample concentration data may be assumed to be normally distributed and may be used directly in determining the confidence interval. The upper limit of the confidence interval is compared with the applicable class limits in Appendix I of Chapter 3745-30-04 of the Administrative Code. The upper limit of the confidence interval shall be less than or equal to the applicable class limit.

*** DRAFT - NOT YET FILED ***

3745-30-04 **Residual waste landfill classification.**

(A) After an individual waste specified in paragraph (B)(1), (B)(2), (B)(3), (B)(4), (B)(5), (B)(6), or (B)(7) of rule 3745-30-01 of the Administrative Code is characterized in accordance with rule 3745-30-03 of the Administrative Code, the applicant or permittee shall determine the appropriate residual waste landfill class in accordance with appendix I of this rule. The concentration of any parameter, based on the upper limit of the confidence interval specified in paragraph (E) of rule 3745-30-03 of the Administrative Code, shall not exceed the delineated maximum allowable concentration for the proposed class.

(B) No maximum allowable concentration is delineated in Appendix I of this rule for a class I landfill. Any residual waste may be disposed in a class I landfill provided the waste is not a hazardous waste as defined in Chapter 3745-51 of the Administrative Code. The concentration of the parameters in appendix I need not be determined for the purposes of the residual waste landfill classification process if a class I residual waste landfill is proposed.

(C) Residual wastes which do not exceed the maximum allowable concentrations delineated in appendix I of this rule for a class IV residual waste landfill are eligible for disposal in a class IV residual waste landfill in locations where the siting criteria specified in paragraph (B) of rule 3745-30-06 of the Administrative Code for a class III landfill are met.

(1) Such locations shall not be areas where the ground water quality has been degraded due to human activities; with the exception of such locations where the quality of ground water has been degraded due to permitted mining operations or pre-law mining operations.

(2) To determine appropriate environmentally protective measures for the class IV residual waste landfill, the following information comparing the concentration of chemical constituents in the ground water of the first saturated zone beneath the landfill or proposed landfill with the concentration of the same chemical constituents in the leachate from the residual waste(s) shall be submitted and contain all of the following:

(a) A chemical analysis of actual in-field leachate from the residual waste(s). For the purpose of this rule, the chemical analysis is defined as analysis of those parameters specified by waste type for characterization in paragraph (A) or (B) of rule 3745-30-03 of the Administrative Code and for annual and semiannual monitoring specified in appendix III of rule 3745-30-08 of the Administrative Code. The chemical analysis may also be utilized to meet the requirements of rule 3745-30-03 of the Administrative Code if the sampling and testing criteria of that rule are met. The analysis shall be performed on actual leachate from the

*** DRAFT - NOT YET FILED ***

residual waste(s) which represents long-term field leachate generated by either of the following:

(i) An existing disposal facility.

(ii) A field test cell which simulates actual disposal conditions for a minimum period of one year, or an alternate duration if deemed acceptable by the director.

(b) A chemical analysis, as defined in paragraph (C)(2)(a) of this rule, of the ground water in the first saturated zone beneath the landfill or proposed landfill.

(c) The comparison shall be of the mean concentrations from at least three independent samples of the ground water and of the leachate, or an alternate statistical procedure approved by the director.

(3) In locations where all constituents are lower in concentration in the leachate than in the ground water, the requirements for a class IV residual waste landfill shall differ from the requirements for a class III residual waste landfill as follows:

(a) The ground water monitoring program specified in rule 3745-30-08 of the Administrative Code is not required.

(b) The recompacted soil liner specified in paragraph (C)(1) of rule 3745-30-07 of the Administrative Code is not required.

(c) The geomembrane specified in rule 3745-30-07 of the Administrative Code is not required.

(d) The leachate collection system specified in rule 3745-30-07 of the Administrative Code is not required, unless the director determines, on a site-specific and waste-specific basis, that long-term saturated conditions to be caused by the lack of a leachate collection system could create leachate that will have higher concentrations of constituents than the leachate characterized in accordance with paragraph (C)(2)(a) of this rule or that long-term saturated conditions could cause surface water pollution.

(e) The cap system specified in paragraph (F)(3) of rule 3745-30-09 of the

*** DRAFT - NOT YET FILED ***

Administrative Code shall comply with the following:

(i) The recompacted soil barrier layer may be constructed of material classified as CL, SC, GC, or CL-ML under the unified soil classification system (USCS). The specifications and test pad referenced from rule 3745-30-07 of the Administrative Code are not required. The construction specifications and material testing frequency shall be determined by the director .

(ii) The vegetative layer thickness shall meet the requirement for root penetration protection but the thickness for frost protection is not required.

(f) The post closure care period specified in paragraph (A) of rule 3745-30-10 of the Administrative Code is five years.

(4) In locations where a number of constituents are of higher concentration in the leachate than in the ground water, the director may allow each of the requirements for a class IV landfill listed in paragraphs (C)(3)(a) to (C)(3)(f) of this rule on a site-specific basis if it is demonstrated to the satisfaction of the director that for each requirement the class IV standard is unlikely to cause a nuisance or a health hazard or result in a violation of any regulation adopted under Chapters 3704. and 6111. of the Revised Code.

(D) If, in accordance with paragraph (B) of rule 3745-30-03 of the Administrative Code, a parameter is added to the list prescribed in paragraph (A) of that rule, the maximum allowable concentration shall be set as follows:

(1) For class IV landfills, five times the maximum contaminant level established in Chapters 3745-81 and 3745-82 of the Administrative Code.

(2) For class III landfills, thirty times the maximum contaminant level established in Chapters 3745-81 and 3745-82 of the Administrative Code.

(3) For class II landfills, sixty times the maximum contaminant level established in Chapters 3745-81 and 3745-82 of the Administrative Code.

Appendix I
Residual waste characterization and residual waste landfill classification

		Maximum Allowable Concentration (ppm or mg/l)		
		Residual Waste Landfill		
Number	Parameter	Class IV	Class III	Class II
1	arsenic	0.25	1.5	3.0
2	barium	5.0	30.0	60.0
3	cadmium	0.05	0.3	0.6
4	chromium	0.25	1.5	3.0
5	fluoride	20.0	120.0	240.0
6	lead	0.25	1.5	3.0
7	mercury	0.01	0.06	0.12
8	selenium	0.05	0.3	0.6
9	silver	0.25	1.5	3.0
10	chloride	*	7500	**
11	iron	*	9.0	**
12	manganese	*	9.0	**
13	sodium	*	7500	**
14	sulfate	*	7500	**
15	total dissolved solids	*	10,000	**
16	phenol	17.5	105.0	**
17	cyanide	1.0	6.0	12.0
18	benzene	0.025	0.15	0.3
19	carbon tetrachloride	0.025	0.15	0.3
20	chlorobenzene	5.0	30.0	60.0
21	chloroform	0.3	1.8	3.6
22	m-cresol	10.0	60.0	120.0
23	o-cresol	10.0	60.0	120.0
24	p-cresol	10.0	60.0	120.0
25	1,4 dichlorobenzene	0.38	2.25	4.50
26	1,2 dichloroethane	0.025	0.15	0.3
27	1,1 dichloroethylene	0.035	0.21	0.42
28	2,4 dinitrotoluene	0.0065	0.039	0.078
29	hexachloro-1,3 butadiene	0.025	0.15	0.3
30	hexachlorobenzene	0.0065	0.039	0.078

31	hexachloroethane	0.15	0.9	1.80
32	methylethylketone	10.0	60.0	120.0
33	nitrobenzene	0.1	0.6	1.2
34	pyridine	0.25	1.5	3.0
35	tetrachloroethylene	0.035	0.21	0.42
36	trichloroethylene	0.025	0.15	0.3
37	2,4,5 trichlorophenol	20.0	120.0	240.0
38	2,4,6 trichlorophenol	0.1	0.6	1.2
39	vinyl chloride	0.01	0.06	0.12
40	pH	***	***	***

* No maximum allowable concentration is delineated for a class IV landfill, but the leachate concentration must be less than the class III maximum allowable concentration. The chemical analysis of ground water in the first saturated zone beneath the landfill or proposed landfill required by paragraph (C) of this rule will be utilized to determine appropriate environmentally protective measures.

** No maximum allowable concentration is delineated for a class II landfill. The concentration of these parameters need not be determined for the class II residual waste landfill classification process.

*** The pH value must be determined and reported for informational purposes; however, the residual waste landfill classification is not dependent on the pH value.

*** DRAFT - NOT YET FILED ***

3745-30-05 **Residual waste landfill facility permit to install application.**

(A) A permit to install application as required by section 3734.05 of the Revised Code shall be submitted, and approved by the director, before the establishment or modification of the residual waste landfill facility is begun. Compliance with this rule shall not exempt any person from compliance with any other permit, license, or other obligation for authorization.

(1) The permit to install application shall contain all the information required in paragraphs (B) and (C) of this rule, as specified below, so that the director can determine if the criteria set forth in rules 3745-27-02 and 3745-30-06 of the Administrative Code are satisfied. If Ohio EPA determines that information in addition to that required by paragraphs (B) and (C) of this rule is necessary to determine whether the criteria set forth in rules 3745-27-02 and3745-30-06 of the Administrative Code are satisfied, the applicant shall supply such information as a precondition to further consideration of the permit to install application.

(a) The permit to install application for a new residual waste landfill facility, to modify a residual waste landfill facility for a lateral expansion, or one that is submitted in response to division (A)(3), (A)(4) or (A)(5) of section 3734.05 of the Revised Code, shall contain all the information required in paragraphs (B) and (C) of this rule with the exception of paragraph (B)(5)(d) of this rule.

(b) The permit to install application to modify a residual waste landfill facility for a vertical expansion to the upper limits of solid waste placement shall contain the following information:

(i) All of the plan sheets specified in paragraphs (B)(1), (B)(2), (B)(3)(g), (B)(4), (B)(5) and (B)(6) of this rule.

(ii) The plan sheet showing the location of any proposed explosive gas control system, if necessary, specified in paragraph (B)(3)(f) of this rule.

(iii) Detail drawings, as necessary, specified in paragraph (B)(7) of this rule.

(iv) All the reports specified in paragraphs (C)(1), (C)(2), and (C)(7) of this rule.

(v) The subsurface investigation report, as necessary to provide

*** DRAFT - NOT YET FILED ***

supporting information for the stability analysis, specified in paragraph (C)(4) of this rule.

(vi) Stability analysis for bearing capacity, static stability, seismic stability and settlement specified in paragraphs (C)(5)(b) to (C)(5)(f) of this rule.

(vii) Calculations, as necessary, specified in paragraph (C)(6) of this rule.

(viii) The quality assurance/quality control plan and the final closure/post-closure care plan, specified in paragraphs (C)(9)(c) and (C)(9)(d) of this rule.

(ix) The letters, description, and list of permits specified in paragraphs (C)(10)(a), (C)(10)(b), and (C)(10)(c) of this rule.

(c) The permit to install application to modify a residual waste landfill facility for a vertical expansion to the lower limits of solid waste placement shall contain the following information:

(i) All of the plan sheets specified in paragraphs (B)(1) to (B)(6) of this rule.

(ii) Detail drawings, as necessary, specified in paragraph (B)(7) of this rule.

(iii) All of the reports specified in paragraphs (C)(1), (C)(2), (C)(4), and (C)(8) of this rule.

(iv) Stability analysis for hydrostatic uplift, bearing capacity, static stability, seismic stability and settlement specified in paragraphs (C)(5)(a) to (C)(5)(e) of this rule.

(v) Calculations, as necessary, specified in paragraph (C)(6) of this rule.

(vi) The explosive gas monitoring plan, as necessary, specified in paragraph (C)(9)(b) of this rule.

(vii) The quality assurance/quality control plan, as necessary, specified

*** DRAFT - NOT YET FILED ***

in paragraph (C)(9)(c) of this rule.

(viii) The letters, description, and list of permits specified in paragraphs (C)(10)(a), (C)(10)(b), and (C)(10)(c) of this rule.

(d) The permit to install application to modify a residual waste landfill facility for a change to the information specified in paragraph (C)(3) or (C)(8) of this rule shall discuss the change pursuant to paragraph (C)(3) or (C)(8) of this rule in addition to the following:

(i) The summary specified in paragraph (C)(1) of this rule.

(ii) Any variance or exemption requests specified in paragraph (C)(2) of this rule.

(iii) If the change is to the authorized maximum daily waste receipt, the calculations showing gross volume and life specified in paragraph (C)(6)(a) of this rule.

(iv) The certification specified in paragraph (C)(10)(e) of this rule.

(e) The permit to install application to modify a residual waste landfill facility, other than what is listed in paragraphs (A)(1)(b) to (A)(1)(d) of this rule, shall contain the information specified by paragraphs (B) and (C) of this rule that are affected by the change and shall incorporate any alterations that were previously approved for those components affected by the change.

(2) The permit to install application shall contain detail engineering plans, specifications, and information that shall follow the format specified in paragraphs (B) and (C) of this rule. Detail shall be sufficient to allow clear understanding for technical review of the permit application, to provide assurance that the facility is designed and will be operated in accordance with Chapters 3745-30 and 3745-37 of the Administrative Code.

(3) [Reserved.]

(4) For regulatory review purposes, the initial application and any subsequent revisions to the application, shall be submitted in duplicate to the director with a third copy sent to the board of health of the health district where the facility is or will be located. Any revisions to the application must be

*** DRAFT - NOT YET FILED ***

accompanied by an index listing the change and the page(s) where the change occurred. Upon written request from Ohio EPA, the applicant shall submit two additional and identically complete copies of the revised application to the director and a notarized statement that, to the best of the knowledge of the applicant, the detail engineering plans, specifications, and information in the permit application are true and accurate.

(5) Concurrent to submitting the permit to install application, the applicant shall also do the following:

(a) Submit a disclosure statement to the office of the attorney general if required by rules 109:6-1-01 to 109:6-1-04 of the Administrative Code.

(b) Submit to the division of Ohio EPA regulating air pollution control and water pollution control written notification of intent to establish or modify a residual waste landfill facility and a written request for information pertaining to any regulatory requirements under Chapter 3704. or 6111. of the Revised Code.

(6) The permit to install application, notwithstanding any deficiencies, may be considered and acted upon if sufficient information is provided in the application for the director to determine whether the criteria set forth in rules 3745-27-02 and 3745-30-06 of the Administrative Code are satisfied.

(7) Upon issuance of the permit to install, the director will send one copy of the permit to install and approved permit application to the board of health where the facility is or will be located, will return one copy to the applicant, and will retain two copies in Ohio EPA's files.

(8) The permit to install shall remain in effect until the director has discontinued the post-closure care period, unless the permit has been revoked or terminated in accordance with rule 3745-27-02 of the Administrative Code.

(B) Plan sheets. The following detail engineering plans, specifications, and information for residual waste landfill facilities shall be shown by means of drawings and narrative descriptions where appropriate. Minimum dimensions of the plan drawings shall be twenty-four inches by thirty-six inches. If a class IV residual waste landfill is proposed, any information which pertains only to requirements that are not applicable to a class IV landfill in accordance with paragraph (C)(3) of rule 3745-30-04 of the Administrative Code may be omitted from the detail plans, specifications, and information.

*** DRAFT - NOT YET FILED ***

(1) The detail engineering plan cover sheet, to be numbered sheet 1, shall contain the following information:

(a) The name of the residual waste landfill facility.

(b) The precise geographic location and boundaries of the residual waste landfill facility and the area within a five-mile radius shown on a road map with a scale of one inch equals no greater than one mile.

(c) The name and address of the applicant and the residual waste landfill facility operator.

(d) The name and address of the owner(s) of the land to be used for the residual waste landfill facility.

(e) The name and address of the person who prepared the plans.

(f) Index of plan sheets.

(2) Plan drawings, showing the following items located within the facility boundary or within one thousand feet of the limits of residual waste placement, shall contain all information in paragraphs (B)(2)(a) to (B)(2)(c) of this rule. Those items specified in paragraphs (B)(2)(b) and (B)(2)(c) of this rule shall be illustrated on a series of plan drawings which shall be numbered consecutively: 2A, 2B, 2C, etc. All items specified in an individual subheading shall be shown on the same plan drawing or a note shall be on the plan sheet stating the item does not exist within the specified distance of the limits of residual waste placement. An individual plan drawing may contain information specified in more than one individual subheading. A scale of one inch equals no greater than two hundred feet shall be used.

(a) All plan drawings required by paragraph (B)(2) of this rule shall include the following:

(i) The property lines of land owned or leased for the residual waste landfill facility as determined by a property survey conducted by a professional surveyor registered in Ohio.

(ii) The limits of residual waste placement.

*** DRAFT - NOT YET FILED ***

(iii) All occupied structures.

(iv) Existing topography showing streams, swamps, lakes, springs, wetlands and other surface waters, with a contour interval no greater than five feet.

(v) The north arrow.

(vi) The location of all survey marks.

(vii) The facility boundary.

(b) The following based on publicly available information. For the purposes of this rule, "publicly available information" means written or published information from public or private sources that is reasonably available to the public, and includes but is not limited to visual surveys from public right-of-ways and public lands of the area surrounding the proposed residual waste landfill facility and/or written or oral surveys of the landowners around the proposed residual waste landfill facility.

[Comment: As long as the applicant can document that a reasonable attempt was made to obtain the information, the application will be considered complete even if information is lacking (e.g. the written or oral survey is not responded to).]

(i) All zoning classifications, property owners, and political subdivisions.

(ii) All man-made potential explosive gas migration pathways, including underground utilities (sewers, water lines, electric cables), field tiles, french drains, pipelines, and all other potential sources of explosive gas including oil wells and gas wells and other landfills. This requirement applies only to facilities that are required to have an explosive gas monitoring system by paragraph (C)(10) of this rule.

(iii) The limits of all regulatory flood plains.

(iv) National park of recreation areas, candidate areas for potential inclusion into the national park system, and any state park or established state park purchase areas.

*** DRAFT - NOT YET FILED ***

(v) State nature preserves, state wildlife areas, national and state scenic rivers, any national wildlife refuge, special interest areas, research natural areas in the Wayne national forest, outstanding national resource waters, and exceptional coldwater habitats, or exceptional warmwater habitats as defined in Chapter 3745-1 of the Administrative Code.

(vi) All public and private water supply wells within two thousand feet of the limits of residual waste placement (use a scale insert if necessary).

(vii) The limits of all wellhead protection areas or ground water source water assessment and protection areas that have been endorsed or delineated by Ohio EPA for a public water supply.

(viii) Faults that have had displacement in Holocene time.

(ix) All surface and underground mining of coal and noncoal minerals and the angle of draw within two thousand feet of the limits of residual waste placement (use a scale insert if necessary) and all oil and gas wells.

(x) The limits of all aquifers declared by the federal government under the Safe Drinking Water Act, 42 U.S.C 300f et. seq. (2003), to be a sole source aquifer.

(c) The limits of disturbance and the facility boundary. The limits of disturbance includes but is not limited to the limits of excavation, borrow areas, storage areas, staging areas, areas to be cleared and grubbed, and roadways.

(3) Plan drawings, showing the following items located within three hundred feet of the limits of residual waste placement, shall contain all information in paragraphs (B)(3)(a) to (B)(3)(h) of this rule. Those items specified in paragraphs (B)(3)(a) to (B)(3)(h) of this rule shall be illustrated on a series of plan drawings which shall be numbered consecutively: 3A, 3B, 3C, etc. All items specified in an individual subheading shall be shown on the same plan drawing (unless specified otherwise). An individual plan drawing may contain information specified in more than one individual subheading. A scale of one inch equals no greater than two hundred feet shall be used.

(a) All plan drawings required by paragraph (B)(3) of this rule shall include

*** DRAFT - NOT YET FILED ***

those items specified in paragraph (B)(2)(a) of this rule.

(b) The location of existing or proposed pipes and conduits, electric lines, french drains, roads, and railroads, and any easements bordering or within the proposed facility boundaries.

(c) The location of all subsurface investigation sites, which are any location where subsurface conditions are investigated by data collection and/or evaluation, including but not limited to borings, test pits, monitoring wells, piezometers, tensiometers, geophysical survey stations and soil gas survey stations, and all proposed ground water monitoring wells.

(d) Potentiometric maps of the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system (more than one plan sheet may be used).

(e) The location of any permanent ground water control structures.

(f) The location of any existing or proposed explosive gas control system.

(g) A diagram showing the phases of the facility.

(h) The land set aside for leachate treatment/pre-treatment facilities if required by paragraph (C)(3)(g) of rule 3745-30-07 of the Administrative Code.

(4) Plan drawings for the entire residual waste landfill facility showing the grades of the following items shall be on plan drawings numbered consecutively 4A, 4B, 4C, etc. The scale on these drawings shall be one inch equals no greater than two hundred feet and contour intervals shall be no greater than five feet for slopes less than or equal to twenty-five per cent and ten feet for slopes greater than twenty-five per cent.

(a) The horizontal and vertical limits of excavation proposed in the permit to install application, showing any areas where added geologic material necessary to comply with the isolation distance requirement in rule 3745-30-06 of the Administrative Code is to be placed.

(b) The horizontal limits and top and bottom elevations of the recompacted soil liner proposed in the permit to install application.

*** DRAFT - NOT YET FILED ***

(c) The top elevation of the leachate collection layer, pipe inverts, and layout of the leachate collection and management system(s), including any leachate storage tanks, proposed in the permit to install application.

(d) The horizontal limits and top and bottom elevations of all existing waste and waste placement proposed in the permit to install application. Limits and elevations of existing waste can be determined by surveys. If a residual waste landfill facility was not required or does not have survey results, the owner or operator shall provide justification of the limits shown in the permit to install application. If the authorizing document(s) does not show limits of existing waste placement, then the elevation of final waste placement shall be deemed to be two feet below the final grade shown, unless alternative limits are satisfactorily demonstrated to Ohio EPA.

(e) If a separatory liner/leachate collection system is required, its horizontal limits and top and bottom elevations.

(f) The horizontal limits and top and bottom elevations of the cap system; surface water control structures including permanent ditches to control run-on and runoff; and sedimentation ponds including the inlet and outlet; and any permanent ground water control structures proposed in the permit to install application.

(g) Establish a grid system with northings and eastings not more than five hundred feet apart.

(5) Cross sections of the following shall be on plan drawings numbered consecutively 5A, 5B, 5C, etc. and shall clearly show the horizontal and vertical scale used:

(a) The hydrogeology of the residual waste landfill facility intercepted by borings or other subsurface investigation methods showing the following:

(i) Existing topography.

(ii) The horizontal and vertical limits of excavation proposed in the permit to install application.

(iii) The horizontal limits and top and bottom elevations of any added

*** DRAFT - NOT YET FILED ***

geologic material.

(iv) The horizontal limits and bottom elevations of the recompacted soil liner, if any.

(v) Geologic stratigraphy and significant zones of saturation corresponding to information from the subsurface investigation.

(vi) The uppermost aquifer system and all saturated stratigraphic units above the uppermost aquifer system.

(vii) All subsurface investigation logs, and monitoring well and piezometer construction diagrams, intercepted by the cross-section.

(viii) Any permanent ground water control structures.

(b) The perimeter of the property showing the natural potential explosive gas migration pathways. This requirement applies only to facilities that are required to have an explosive gas monitoring system by paragraph (C)(10) of this rule.

(c) The length and width of the residual waste facility dividing the facility into quarters (i.e. three cross-sections in each direction) showing the following:

[Comment: Additional cross-sections may be submitted.]

(i) Existing topography.

(ii) The proposed horizontal and vertical limits of excavation.

(iii) The horizontal limits and top and bottom elevations of all existing waste and all proposed areas of waste placement.

(iv) The horizontal limits and top and bottom elevations of the proposed cap system.

(d) If the permit to install application is for a vertical expansion, show the following at an interval no greater than every three hundred feet of

*** DRAFT - NOT YET FILED ***

length and width of the vertical expansion:

(i) Limits of existing waste with the date of the survey.

(ii) Approved and proposed limits of waste placement.

(iii) Separatory liner/leachate collection systems.

(6) Plan drawings showing the systematic development of each phase of the residual waste landfill facility. Each drawing numbered consecutively 6A, 6B, 6C, etc. shall show the phase, all previously operated phases, the grid system established in accordance with paragraph (B)(4)(g) of this rule, and all of the following:

(a) The location of any ground water monitoring wells, piezometers, explosive gas permanent monitors and punch bar stations and alarms (if required), leachate collection and management structures, or surface water control structures to be installed prior to accepting waste in the depicted phase.

(b) Extent of waste placement for that phase.

(c) The contours of any previously filled phases.

(d) The limits of final cover and intermediate cover on the previously filled phases.

(e) The contours of the bottom limits of solid waste placement for the depicted phase.

(f) Location of access roads for the depicted phase.

(g) The permanent and temporary measures to be utilized to control surface water run-on and runoff, erosion, and any temporary or permanent ground water control structures.

(7) The following detail drawings shall be on plan drawings numbered consecutively 7A, 7B, 7C, etc.:

(a) Recompacted soil liner, flexible membrane liner (if applicable),

*** DRAFT - NOT YET FILED ***

geosynthetic liner (if applicable), liner cushion layer, leachate collection layer, and filter layer (if required) including any engineered components that are constructed through the liner system, and the interface between phases.

(b) Cap system, including any engineered components that are constructed through the cap system, and surface water control structures.

(c) Relationship of the cap system to the leachate collection and management system and recompacted soil liner.

(d) All leachate collection and management system elements, including but not limited to the following:

(i) Leachate collection layer.

(ii) Collection pipes, including bedding media and boots.

(iii) Filter layer, if required.

(iv) Any sumps.

(v) Any conveyance apparatus.

(vi) Any storage tanks.

(e) Permanent ground water control structures, if any.

(f) Ground water monitoring well and piezometer construction.

(g) Explosive gas control system elements, if any.

(h) Separatory liner/leachate collection systems, if required.

(i) Sedimentation pond and discharge structures, if any, and surface water run-on and runoff control structures.

(j) A general process flow diagram which displays the processes, points of waste generation, and types of wastes generated.

*** DRAFT - NOT YET FILED ***

(k) Other necessary details, including but not limited to structural fill for berms and subbase, and the gas collection layer.

(C) Reports. The following information shall be presented in narrative form in a report with a table of contents and divided and labeled according to paragraphs and subparagraphs (C)(1) to (C)(10) of this rule. If a class IV residual waste landfill is proposed, any information which pertains only to requirements that are not applicable to a class IV landfill in accordance with paragraph (C)(3) of rule 3745-30-04 of the Administrative Code may be omitted from the narrative information.

(1) Summary. Summary of the waste characterization and proposed landfill classification, the facility environs and a demonstration that the residual waste landfill facility will meet the criteria for permit approval by the director specified in rules 3745-27-02 and 3745-30-06 of the Administrative Code. The demonstration shall include a discussion of the facility's, owner's, or operator's compliance with any applicable authorizing document(s), the facility's limits of waste placement, and operational criteria.

[Comment: The discussion of the facility's, owner's, or operator's compliance status should compare the limits of waste placement specified in the facility's authorizing document(s) with the information on existing waste required by paragraphs (B)(4) and (B)(5) of this rule. The discussion should also include the facility's, owner's, or operator's compliance with the operational requirements in rule 3745-30-14 of the Administrative Code.]

(2) Variance and exemption requests. Any variance or exemption requests from the requirements in rule 3745-27-12, 3745-27-15, 3745-27-16, 3745-29-09, 3745-30-03, 3745-30-04, 3745-30-05, 3745-30-06, 3745-30-07, 3745-30-08, 3745-30-10, or 3745-30-14 of the Administrative Code.

(3) A residual waste characterization report, which shall at a minimum include the following:

(a) A listing of each residual waste proposed for disposal, and its approximate percentage of total residual waste disposal by weight and volume.

(b) The name, location, and contact person of each generator of residual waste to be disposed at the landfill.

(c) The residual waste sampling plan used to ensure that accurate and representative sampling of the waste, in accordance with paragraph (E)

*** DRAFT - NOT YET FILED ***

of rule 3745-30-03 of the Administrative Code, occurs prior to testing.

(d) A description of any mixing to be proposed for purposes described in either paragraph (B)(2) of rule 3745-30-03 of the Administrative Code or paragraph (V)(4) of rule 3745-30-14 of the Administrative Code, and if for the former paragraph, any available information which will be required by that paragraph.

(e) Any methods used to stabilize the residual waste for compliance with paragraph (P) of rule 3745-30-14 of the Administrative Code.

(f) All laboratory results and supporting quality assurance/quality control documentation that fully characterizes each residual waste as specified in rule 3745-30-03 of the Administrative Code.

(4) Site investigation. A hydrogeologic and geotechnical site investigation report(s), which shall at a minimum include the following:

(a) Sufficient information to allow the director to determine the suitability of the site for residual waste disposal through the following:

(i) Identification and characterization of the hydrogeology of the uppermost aquifer system and all stratigraphic units that exist above the uppermost aquifer system.

(ii) Characterization of the site geology and hydrogeology to allow for the evaluation of the proposed design of the facility and to ensure that it will be in compliance with the requirements of rules 3745-30-06 and 3745-30-08 of the Administrative Code.

[Comment: The narrative portion of the hydrogeologic and geotechnical report focuses on the siting and ground water monitoring issues. The subsurface investigation portion of the report also addresses stability and design issues.]

(b) A description, based on publicly available information, of the regional geology and hydrogeology within one mile of the proposed residual waste landfill facility. This shall include, but is not limited to the following:

[Comment: Publicly available information regarding unstable areas is placed in a separate section located in the stability analysis in paragraph

*** DRAFT - NOT YET FILED ***

(C)(5) of this rule.]

(i) The identification and average yield of the regional aquifer system(s).

(ii) The direction of ground water flow in the regional aquifer system(s).

(iii) The identification of recharge and discharge areas, within one mile of the limits of solid waste placement, of the regional aquifer system(s).

(iv) Regional stratigraphy, including any regional stratigraphic or structural features, such as the bedrock surface, bedrock dip, or joint systems, that may influence the ground water flow system.

(v) A description of the regional geomorphology, including the location of surface water bodies, flood plains, etc. and a description of any topographic features that may influence the ground water flow system.

(c) The following documents:

(i) If any surface or underground mines were identified in accordance with paragraph (B)(2)(b)(ix) of this rule, a letter from the Ohio department of natural resources, division of mineral resources management or other appropriate agency verifying type, mining method, location, depth, and status.

(ii) Documentation of who owns the mineral rights below the residual solid waste landfill facility.

(iii) If any oil or gas wells were identified in accordance with paragraph (B)(2)(b)(ix) of this rule, a letter from the Ohio department of natural resources division of mineral resources management or other appropriate agency verifying type, location, depth and status.

(iv) A letter from the army corps of engineers agreeing with the wetland delineation, as depicted on the plan drawing with the information required by paragraph (B)(2)(a)(iv) of this rule, including if

*** DRAFT - NOT YET FILED ***

appropriate, that no wetlands are present, and if any wetlands are isolated.

(d) A detailed description and analysis of the geology and hydrogeology under the proposed residual waste landfill facility. This description shall be based on data collected using appropriate subsurface investigatory methods such as borings, monitoring wells, tensiometers, piezometers, geophysical surveys, soil gas surveys, dutch cone penetrometers, and test pits. The description and analysis shall include, but is not limited to, the following:

[Comment: This information may also be used in the stability analysis required by paragraph (C)(5) of this rule.]

(i) The consolidated and unconsolidated stratigraphic units from the ground surface down to the base of the uppermost aquifer system including the following:

(a) Characteristics, composition and features including the following:

(i) For unconsolidated stratigraphic units, the textural classification using the Unified Soil Classification System (USCS), described in ASTM D2487-00.

(ii) For consolidated stratigraphic units, the rock type(s) such as limestone, dolomite, coal, shale, siltstone, sandstone.

(iii) Color; moisture content; stratigraphic features such as layering, interbedding, or weathering; fracturing, jointing, and other types of secondary porosity; and any visible accessory minerals such as pyrite, calcite or gypsum.

(iv) Hydraulic conductivity.

(b) Thickness.

(c) Lateral extent.

*** DRAFT - NOT YET FILED ***

(d) Depth and elevation.

(e) Variations in texture, saturation, stratigraphy, structure, or mineralogy exhibited by each stratigraphic unit that could influence the ground water flow or quality in the uppermost aquifer system or any overlying zones of saturation.

(ii) The local geomorphology at the proposed residual waste landfill facility including surface water bodies or topographic features that could influence the ground water flow or quality in the uppermost aquifer system or any overlying zones of saturation.

(iii) Any local structural geologic features under the proposed residual waste landfill facility that could influence the ground water flow or quality in the uppermost aquifer system or any overlying zones of saturation.

(iv) The uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system. This description shall include the depth to, and lateral and vertical extent of, the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system. This description and analysis shall include but not be limited to the following:

(a) Temporal fluctuations in ground water levels over a period of time to determine the seasonal effects on ground water flow directions.

[Comment: Temporal fluctuations will also be used for determining the temporal high phreatic and piezometric surfaces, required to address stability issues.]

(b) An interpretation of the ground water flow system, including hydraulic conductivity, rate of flow, direction of flow, vertical and lateral components of flow, and interconnections between and within the uppermost aquifer system and any significant zones of saturation above the uppermost aquifer system. This interpretation shall be described in both narrative and map form.

(c) Identification and characterization of recharge and discharge areas within the boundaries of the proposed residual waste

*** DRAFT - NOT YET FILED ***

landfill facility. This shall include any relationships of ground water with seeps, springs, streams, and other surface water features.

(d) Yield of any significant zones of saturation and of the uppermost aquifer system(s).

(v) If the applicant chooses, site specific justification that an unconsolidated aquifer system capable of sustaining a yield of one hundred gallons per minute for a twenty-four hour period (based on evidence gathered in accordance with paragraph (C)(4)(b) of this rule), is not located beneath the facility.

(e) A description and quantification of the ground water quality of the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system. This shall include a description and the source of any ground water contamination located under the facility.

(f) Subsurface investigation information. The following information will be used to prepare the site investigation report narrative required in paragraphs(C)(4)(b), (C)(4)(d), and (C)(4)(e) of this rule and the stability analyses required in paragraph (C)(5) of this rule. All submitted information shall be adequate to satisfy the performance standards of paragraphs (C)(4)(a) and (C)(5) of this rule. At a minimum the information shall include the following:

[Comment: The narrative portion of the hydrogeologic and geotechnical report focuses on the siting and ground water monitoring issues. The subsurface investigation portion of the report also address stability and design issues.]

(i) Publicly available information collected and used to prepare the site investigation report narrative required in paragraph (C)(4)(b) of this rule and the plan sheets required in paragraph (B)(2) of this rule. For the purposes of this rule, "publicly available information" means written or published information from public or private sources that is reasonably available to the public, and includes but is not limited to visual surveys from public right-of-ways and public lands of the area surrounding the proposed residual waste landfill facility and/or written or oral surveys of the landowners around the proposed residual waste landfill facility. At a minimum, the publicly available information includes the following:

*** DRAFT - NOT YET FILED ***

[Comment: As long as the applicant can document that a reasonable attempt was made to obtain the information, the application will be considered complete even if information is lacking (e.g. the written or oral survey is not responded to).]

(a) All well logs, and, where applicable, the decommissioning records, for public and private water supply wells within one mile of the proposed residual waste landfill facility.

(b) The Ohio department of natural resources division of water's county ground water resource maps or other appropriate regional hydrogeological data.

(c) Other publicly available information.

(ii) Information collected at the site for each stratigraphic unit from the surface to the bottom of the uppermost aquifer system or to one hundred and fifty feet below the proposed liner system, whichever is shallower. The information will be used to prepare the site investigation report narrative required in paragraph (C)(4)(d) of this rule. This information shall be presented on logs appropriate for the subsurface investigatory method used. At a minimum that information shall include the following:

[Comment: The subsurface investigation conducted to provide the information required by this paragraph may be combined with the subsurface investigation conducted to provide the information required by paragraph (C)(4)(f)(v) of this rule.]

(a) Location of the subsurface investigation site (northing and easting location coordinates).

(b) Surface elevation surveyed to the nearest tenth of a foot.

(c) Depth interval for each stratigraphic unit.

(d) Field descriptions of the consolidated and unconsolidated units. At a minimum the information shall include the following:

(i) Textural classification for each unconsolidated stratigraphic unit using the Unified Soil Classification

*** DRAFT - NOT YET FILED ***

System (USCS), described in ASTM D2487-00.

(ii) Color.

(iii) Moisture content.

(iv) Stratigraphic features such as layering, interbedding, or weathering.

(v) Structural features such as fracturing or jointing.

(vi) Visible accessory minerals such as pyrite, calcite or gypsum.

(vii) Rock type such as limestone, dolomite, coal, shale, siltstone or sandstone.

(viii) Thickness.

(ix) Variations in texture, saturation, stratigraphy, structure or mineralogy in each stratigraphic unit.

(e) Depth to saturation.

(f) Hydraulic conductivity, including the following:

(i) For saturated unconsolidated stratigraphic units, at least one field measurement of hydraulic conductivity per saturated unconsolidated unit and one additional measurement per saturated unconsolidated unit for each twenty acres.

(ii) For unconsolidated stratigraphic units, from which an undisturbed sample can be collected, at least one laboratory measurement of vertical hydraulic conductivity per unconsolidated unit and one additional measurement per unconsolidated unit for each twenty acres.

(iii) For saturated consolidated stratigraphic units, at least one field measurement of hydraulic conductivity per

*** DRAFT - NOT YET FILED ***

saturated consolidated unit and one additional measurement per saturated consolidated unit for each twenty acres.

[Comment: Most field methods for measuring hydraulic conductivity primarily evaluate lateral hydraulic conductivity, but also account for at least some effects of vertical hydraulic conductivity over the tested interval. In cases where laboratory measurements of vertical hydraulic conductivity are obtained for unconsolidated saturated units which are wholly or partially saturated, the vertical hydraulic conductivity should be compared to the field hydraulic conductivity to help evaluate the extent to which near-vertical fractures may be contributing to ground water flow through the unit. Hydraulic conductivity data should be interpreted with respect to the primary and secondary porosity features that are observed or are reasonably expected to occur in the investigated units, as well as the stratigraphic and structural features of the investigated units.]

(g) Yield of any significant zones of saturation and of the uppermost aquifer.

(h) If an unconsolidated aquifer system capable of sustaining a yield of one hundred gallons per minute for a twenty-four-hour period is suspected beneath the facility based on evidence gathered in accordance with paragraph (C)(4)(b) of this rule, and the applicant proposes to revise that finding, the applicant must provide adequate site-specific information on the suspected aquifer system to justify any requested revision, including but not limited to the yield of any aquifer systems below the uppermost aquifer system.

(iii) Construction diagrams of all monitoring wells and piezometers. At a minimum the diagrams shall including the following:

(a) The top-of-casing elevation used for water level measurement reference surveyed to the nearest hundredth of a foot.

(b) The boring diameter and the inside diameter of the well casing.

*** DRAFT - NOT YET FILED ***

(c) The total depth of the boring and the total depth of the well.

(d) The screened interval depth and elevation, and the screen slot size.

(e) A description of all construction materials and depth intervals for all construction materials.

(iv) Data gathered by sampling and analyzing the ground water from the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system. These samples shall, at a minimum, be analyzed for compounds listed in appendix III of rule 3745-30-08 of the Administrative Code.

(v) Information collected at the site and used to prepare the stability analysis required in paragraph (C)(5) of this rule. This information shall be presented on logs appropriate for the subsurface investigatory method used. The subsurface investigatory method(s) and frequency must be adequate to find the unconsolidated stratigraphic units susceptible to bearing capacity failure, static stability failure, seismic stability failure, or settlement, at the site. The information shall be collected for each unconsolidated stratigraphic unit under the facility down to fifty feet below the proposed depths of excavation. At a minimum the information shall include the following:

[Comment: Ohio EPA recommends a frequency of one subsurface investigatory site for every four acres on a more or less uniform grid across the site. However, for sites which are located in areas where landslides or mass movements of unconsolidated material have occurred, or are underlain by complex geology with multiple unconsolidated stratigraphic units, more borings may be necessary pursuant to paragraph (A)(1) of this rule. Sites which are located in areas with a consistent stratigraphy, which is supported by comprehensive and reliable information from previous studies, may use a lower frequency of borings. Ohio EPA recommends against boring through cap, existing waste, or liner to obtain this information. Other methods or increased borings around the landfill footprint should be used.]

[Comment: Given the objective of finding thin unconsolidated stratigraphic units susceptible to bearing capacity failure, static stability failure, seismic stability failure, or settlement, the

*** DRAFT - NOT YET FILED ***

unconsolidated stratigraphic units should be logged continuously, and the subsurface investigation may also need to go deeper if publicly available data gathered pursuant to paragraph (C)(5)(g) of this rule or if field data gathered pursuant to paragraph (C)(4)(d)(i) of this rule indicate that deeper susceptible units exist.]

[Comment: The subsurface investigation conducted to provide the information required by this paragraph may be combined with the subsurface investigation conducted to provide the information required by paragraph (C)(4)(f)(ii) of this rule.]

(a) Northing and easting location coordinates.

(b) Surface elevation surveyed to the nearest tenth of a foot.

(c) Depth interval for each stratigraphic unit.

(d) Field descriptions of the unconsolidated units. At a minimum the information shall include the following:

(i) Textural classification for each unconsolidated stratigraphic unit using the Unified Soil Classification System (USCS), described in ASTM D2487-00.

(ii) Color.

(iii) Moisture content.

(iv) Stratigraphic features such as layering, interbedding, or weathering.

(v) For fine-grained unconsolidated units (e.g. silts and clays), field descriptions of consistency and plasticity or dilatancy.

(vi) Thickness.

(vii) Variations in texture, saturation, stratigraphy, structure or mineralogy in each stratigraphic unit.

*** DRAFT - NOT YET FILED ***

(e) Identification of the depth interval of any samples collected including those submitted for laboratory testing.

(f) Depth to phreatic and piezometric surfaces.

[Comment: "Phreatic surface" is synonymous with the term "water table" and "piezometric surface" is synonymous with the term "potentiometric surface." Hydrogeologic investigations generally use "water table" for a water level surface in an unconfined saturated unit and "potentiometric surface" for the pressure head surface associated with a confined saturated unit. In hydrogeologic applications, the "water table" is considered a special type of potentiometric surface where the head pressure is equal to atmospheric pressure.]

[Comment: Any piezometric surfaces associated with bedrock that may affect the facility during excavation or construction may also be identified.]

(g) Results from penetration testing following ASTM D1586-99, plus the corrected and normalized standard penetration number, or results from mechanical cone penetration testing following ASTM D3441-98.

(h) If appendix I of rule 3745-30-07 of the Administrative Code will be used, the vertical hydraulic conductivity of each unsaturated stratigraphic unit.

(vi) Laboratory analysis on representative samples of all the unconsolidated stratigraphic units under the facility down to a minimum of fifty feet below the proposed depths of excavation. The information is used to prepare the stability analysis required in paragraph (C)(5) of this rule. At a minimum the information shall include the following:

[Comment: Undisturbed samples from at least ten per cent of the borings passing through each susceptible unit, or a minimum of three, whichever is greater, should be collected to provide representative data.]

(a) Grain size distribution (sieve and hydrometer curves).

*** DRAFT - NOT YET FILED ***

(b) Atterberg limits.

(c) Specific gravity.

(d) In situ unit weight.

(e) In situ moisture content.

(f) Dry unit weight.

(g) For unconsolidated stratigraphic units susceptible to bearing capacity failure, the effective drained or undrained peak shear strength parameters as appropriate using direct shear (ASTM D3080-03), unconsolidated undrained compression (ASTM D2850-03a), or consolidated undrained triaxial compression (ASTM D6467-99).

(h) For unconsolidated stratigraphic units susceptible to static stability failure or seismic stability failure, the effective shear strength using ASTM D3080-03 (direct shear test) or ASTM D4767-02 (consolidated undrained triaxial compression test), or ASTM D6467-99 (torsional ring shear test).

(i) For unconsolidated stratigraphic units susceptible to static stability failure or seismic stability failure due to excessive increase in pore pressures from construction and operation activities, the undrained shear strength using fully saturated samples shall be determined using ASTM D2850-03a (unconsolidated-undrained triaxial compression).

(j) For unconsolidated stratigraphic units susceptible to settlement, the following parameters:

(i) The coefficient of consolidation.

(ii) The over consolidation ratio.

(iii) The pre-consolidation pressure.

*** DRAFT - NOT YET FILED ***

(iv) The compression index.

(v) The swelling index.

(vi) The in situ void ratio.

(vii) The effective porosity.

(vii) Any other data generated.

(g) A detailed description of how the subsurface investigation was conducted including the following:

(i) The subsurface investigatory and sampling methods used in characterizing the geologic and hydrogeologic properties of the consolidated and unconsolidated stratigraphic units at the proposed residual waste landfill facility and an explanation of why the particular subsurface investigatory method(s) was chosen.

(ii) The analytical procedures and methodology used to characterize the unconsolidated and consolidated materials obtained from test pits and borings.

(iii) The methodology, equipment, and procedures used to define the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system, including the following:

(a) Well and piezometer construction specifications.

(b) Water level measurement procedures.

(iv) The methodology, equipment, and procedures used to determine the ground water quality in the uppermost aquifer system and any significant zones of saturation above the uppermost aquifer system, including the following:

(a) Collection of ground water samples, including the following:

(i) Well evacuation.

*** DRAFT - NOT YET FILED ***

(ii) Sample withdrawal.

(iii) Sample containers and handling.

(iv) Sample preservation.

(b) Performance of field analysis, including the following:

(i) Procedures and forms for recording data and the exact location, time, and facility-specific considerations associated with the data acquisition.

(ii) Calibration of field devices.

(c) Decontamination of equipment.

(d) Analysis of ground water samples.

(e) Chain of custody control, including the following:

(i) Standardized field tracking reporting forms to record sample custody in the field prior to and during shipment and receipt at lab.

(ii) Sample labels indicating a unique sample number, date, time, sample type, analytical methods, and any other information necessary for effective sample tracking.

(f) Field and laboratory quality assurance and quality control including the following, the number of which shall be enough to adequately demonstrate the accuracy of the analysis results:

(i) Collection of duplicate samples.

(ii) Submission of field-bias blanks.

(iii) Potential interferences.

*** DRAFT - NOT YET FILED ***

(5) Stability analysis. The following analyses establishing the stability of the sanitary landfill facility and the subsurface. The analyses shall provide sufficient information to allow Ohio EPA to sufficiently characterize the facility geology to allow for the evaluation of the proposed design of the residual waste landfill facility.

(a) The hydrostatic uplift analysis shall include the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(4) of this rule, as it pertains to hydrostatic uplift.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate hydraulic uplift.

(iv) A description of the assessed failure modes and conditions.

(v) A narrative description of the rationale used for the selection of the critical cross section that, at a minimum, shall consider the worst case intersection of the highest phreatic or piezometric surface with the maximum excavation depth.

(vi) A plan drawing showing the greatest temporal high phreatic or piezometric surface (prepared in compliance with paragraph (B)(3)(d) of this rule) and the horizontal and vertical limits of excavation (prepared in compliance with paragraph (B)(4)(a) of this rule).

(vii) A profile view of the critical area that fully depicts the analysis input model including the following:

(a) The material boundaries.

(b) The applicable dimensions including but not limited to the depth of excavation, and depth to the temporal high phreatic and piezometric surfaces.

(c) The material types.

*** DRAFT - NOT YET FILED ***

(d) The in situ unit weights and saturated unit weights.

(viii) The actual calculations and/or computer output.

(b) The bearing capacity analysis for any vertical sump risers on the composite liner system shall include the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(4) of this rule, as it pertains to bearing capacity.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate bearing capacity.

(iv) A description of the assessed failure modes and conditions.

(v) A profile view of the critical cross section that fully depicts the analysis input model including the following:

(a) The material boundaries.

(b) The temporal high piezometric surface.

(c) The material types.

(d) The in situ unit weights and saturated unit weights.

(vi) The plan view of the critical cross section including northings and eastings for the endpoints of the section.

(vii) The actual calculations and/or computer output.

(c) The static stability analysis shall include the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(4) of this rule, and earthen materials testing program as it pertains to static stability.

*** DRAFT - NOT YET FILED ***

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate static stability.

(iv) An assessment of failure modes and conditions that at a minimum should include the following:

(a) Deep-seated translational and rotational failure mechanisms of internal slopes, interim slopes, and final slopes for drained conditions and, as applicable, undrained conditions.

(b) Shallow translational and rotational failure mechanisms of internal slopes and final slopes for saturated conditions and drained conditions.

(v) For each of the failure modes and conditions assessed, provide a narrative description of the rationale used for the selection of the critical cross sections for the internal slopes, interim slopes, and final slopes.

(vi) A profile view of the critical cross sections that fully depicts the analysis input model including the following:

(a) The material boundaries.

(b) The temporal high phreatic and piezometric surfaces.

(c) The material types.

(d) The in situ unit weights and, where applicable, the in situ saturated unit weights.

(e) The material shear strengths.

(vii) The plan view of the critical cross sections that includes the northings and eastings for the endpoints of the sections.

(viii) A summary of the results using two dimensional limit equilibrium methods or other methods acceptable to the director for each of

*** DRAFT - NOT YET FILED ***

the critical cross sections.

(ix) The actual calculations and/or computer output.

(d) The seismic stability analysis demonstrating that the design meets the specifications in paragraph (C)(10) of rule 3745-30-07 of the Administrative Code and shall include the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(4) of this rule, and earthen materials testing program as it pertains to seismic stability.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate the seismic stability.

(iv) An assessment of failure modes and conditions that, at a minimum, should include the following:

(a) Deep-seated translational and rotational failure mechanisms of final slopes for drained conditions.

(b) Deep-seated translational and rotational failure mechanisms of internal and interim slopes for drained conditions, if required by the director.

(c) Shallow translational and rotational failure mechanisms of final slopes for drained conditions.

(d) Liquefaction failure mechanisms of internal slopes, interim slopes, and final slopes.

(v) For each of the failure modes and conditions assessed, provide a narrative description of the rationale used for the selection of the critical cross sections for the internal slopes, interim slopes, and final slopes.

(vi) The profile views of the critical cross sections that fully depict the

*** DRAFT - NOT YET FILED ***

analysis input model including the following:

(a) The material boundaries.

(b) The temporal high phreatic and piezometric surfaces.

(c) The material types.

(d) The in situ unit weights and, where applicable, the in situ saturated unit weights.

(e) The material shear strengths.

(vii) The plan views of the critical cross sections that include the northings and eastings for the endpoints of the sections.

(viii) A summary of the results using two or three dimensional limit equilibrium methods or other methods acceptable to the director for each of the critical cross sections.

(ix) The actual calculations and/or computer output.

(e) The settlement analyses of the liner system, if any, shall include the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(4) of this rule, and earthen materials testing program as it pertains to settlement.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate the settlement.

(iv) A description of the assessed failure modes and conditions.

(v) A summary of the results.

(vi) The actual calculations of settlement and/or computer output.

*** DRAFT - NOT YET FILED ***

(f) If a separatory liner is used and is designed with a slope other than that specified by rule 3745-30-07 of the Administrative Code, the settlement analysis of the separatory liner shall include the following:

(i) A narrative description of the rationale used for the selection of the analysis input parameters.

(ii) A description of the method used to calculate the settlement.

(iii) A description of the assessed failure modes and conditions.

(iv) A summary of the results.

(v) The actual calculations of settlement and/or computer output.

(g) A description, based on publicly available information, of unstable areas within one mile of the limits of solid waste placement. For the purposes of this rule, "publicly available information" means written or published information from public or private sources that is reasonably available to the public, and includes but is not limited to visual surveys from public right-of-ways and public lands of the area surrounding the proposed residual waste landfill facility and/or written or oral surveys of the landowners around the proposed residual waste landfill facility. The description shall include the following:

[Comment: As long as the applicant can document that a reasonable attempt was made to obtain the information, the application will be considered complete even if information is lacking (e.g. the written or oral survey is not responded to).]

(i) Any regional stratigraphic or structural features that are susceptible to bearing capacity failure, static stability failure, seismic stability failure, or settlement.

(ii) Areas susceptible to liquefaction.

(iii) Areas susceptible to mass movement such as landslides, debris slides and falls, and rock falls.

(iv) Areas impacted by natural and human induced activities such as cutting and filling, draw down of ground water, rapid weathering,

*** DRAFT - NOT YET FILED ***

heavy rain, seismic activity and blasting.

(v) Presence of karst terrain.

(vi) Presence of underground mining.

(vii) Areas susceptible to coastal and river erosion.

If the residual solid waste landfill facility is located in any of these areas, provide an analysis using the publicly available information and findings of the subsurface investigation conducted in accordance with paragraph (C)(4) of this rule, that demonstrates that the design meets the specifications in paragraph (C)(10) of rule 3745-30-07 of the Administrative Code.

(6) Calculations. The following design calculations with references to equations used, showing site-specific input and assumptions that demonstrate compliance with the design requirements of rule 3745-30-07 of the Administrative Code:

(a) Calculations showing gross volume of the residual waste landfill facility in cubic yards and anticipated life in years.

(b) Recompacted soil liner thickness calculations, from appendix I of rule 3745-30-07 of the Administrative Code, if any.

(c) Calculations for the leachate head and flow.

(d) If leachate is to be recirculated, calculations for the amount of leachate to be recirculated and the leachate head and flow.

(e) Calculations for sizing any leachate storage tanks based on the volume generated after final closure.

(f) Pump size and pipe size calculations based on paragraphs (C)(6)(c) and (C)(6)(d) of this rule.

(g) Pipe strength and pipe deflection calculations for the leachate collection and management system.

*** DRAFT - NOT YET FILED ***

(h) An itemized written final closure cost estimate, in current dollars, based on the following:

(i) The cost of final closure of a residual waste landfill facility in accordance with rule 3745-27-15 of the Administrative Code.

(ii) A third-party conducting the final closure activities, assuming payment to its employees of not less than the applicable prevailing wage.

(i) An itemized written post-closure care cost estimate, in current dollars, based on the following:

(i) The cost of post-closure care of the phase(s) of the residual waste landfill facility in accordance with rule 3745-27-16 of the Administrative Code.

(ii) A third-party conducting the post-closure care activities, assuming payment to its employees of not less than the applicable prevailing wage.

(j) Soil erosion calculations.

(k) Calculations for sizing surface water control structures and verifying that scouring and crushing is minimized.

(l) Calculations for sizing the sedimentation basin, if any.

(m) Other relevant calculations.

(7) Construction information. Discussion of the following construction information:

(a) Installation of the items specified in rule 3745-30-08 of the Administrative Code.

(b) Demonstration of physical and chemical resistance as required in paragraphs (C) and (D) of rule 3745-30-07 of the Administrative Code.

(c) Compaction equipment slope limitations.

*** DRAFT - NOT YET FILED ***

(8) Operational information. State the following information, which if modified, could require a permit:

(a) Technique of waste receipt, including but not limited to acceptance of baled waste or loose waste.

(b) Type of equipment to be used to construct, operate, and maintain the residual waste landfill facility.

[Comment: A change in equipment that decreases the capability of the owner or operator to handle the waste received, may be considered to endanger human health and may require a permit.]

(c) Authorized maximum daily waste receipt requested for the residual waste landfill facility. This requirement shall not apply to a residual waste landfill facility owned by a generator that exclusively disposes of residual wastes generated at one or more premises owned by the generator.

(9) Plans. The following plans:

(a) Ground water monitoring program as required in rule 3745-30-08 of the Administrative Code.

(b) The explosive gas monitoring plan as detailed in rule 3745-27-12 of the Administrative Code, if the facility disposes of residual waste as identified in paragraph (B)(3) of rule 3745-30-01 of the Administrative Code and is not owned by a generator who disposes exclusively of residual waste generated on one or more premises owned by the generator.

(c) The quality assurance/quality control plan for the engineered components addressing the following:

(i) Surveying.

(ii) Calibration of testing equipment.

(iii) Sampling and testing procedures to be used in the field and in the laboratory, including but not limited to the following:

*** DRAFT - NOT YET FILED ***

(a) Testing required by rule 3745-30-07 of the Administrative Code.

(b) Testing required due to design requirements that must be met.

(c) Voluntary testing.

Procedures shall establish testing frequency, parameters, and sample locations.

(iv) Procedures to be followed if a test fails.

(d) The "final closure/post closure care plan" as detailed in paragraph (A) of rule 3745-30-09 of the Administrative Code.

(10) Notifications and certifications. An application for a new residual waste landfill facility or the expansion of an existing residual waste landfill facility shall include the following:

(a) Letters of intent to establish or modify a residual waste landfill, which include a description of property and facility boundaries, shall be sent via certified mail or any other form of mail accompanied by a receipt to the following entities (copies of these letters of intent with copies of the mail receipts shall be included with the application):

(i) The governments of the general purpose political subdivisions where the residual waste landfill facility is located, i.e., county commissioners, legislative authority of a municipal corporation, or the board of township trustees.

(ii) The single county or joint county solid waste management district.

(iii) The owner or lessee of any easement or right of way bordering or within the proposed facility boundaries that may be affected by the proposed residual waste landfill facility.

(iv) The local zoning authority having jurisdiction, if any.

(v) The airport administrator and the federal aviation administration, if the residual waste proposed for disposal may serve as food for birds and if the placement of residual waste has occurred or will

*** DRAFT - NOT YET FILED ***

occur within ten thousand feet of any airport runway used by turbojet aircraft or within five thousand feet of any airport runway used by only piston-type aircraft. "Airport" is defined in rule 3745-27-01 of the Administrative Code.

(vi) The park system administrator, if any part of the facility is located within or shares the park boundary.

(vii) The conservancy district, if any part of the facility is located within or shares the conservancy district boundary.

(b) If the facility exclusively disposes of solid waste generated by the owner of the facility, a description of efforts at the original source of generation to prevent or reduce the generation of the residual solid waste, and efforts to recycle or reuse the residual solid waste in a manner other than disposal.

[Comment: The applicant can contact the office of pollution prevention at Ohio EPA for information on source reduction and recycling. The applicant can contact waste exchanges to find a user for the residual solid waste.]

(c) A list of the permits, licenses, plan approvals, authorizations or other approvals that have been applied for and the local, state or federal office, or agency where application has been made.

(d) Proof of property ownership or lease agreement to use the property as a residual waste landfill facility.

*** DRAFT - NOT YET FILED ***

3745-30-06 **Additional criteria for approval of residual solid waste landfill facility permit to install applications.**

(A) General criteria. The director shall not approve any permit to install application for a residual waste landfill facility unless the director determines all of the following:

(1) Establishment or modification and operation of the residual waste landfill facility will not violate Chapter 3704., 3734., or 6111. of the Revised Code.

(2) The residual solid waste landfill facility will be capable of being constructed, operated, closed, and maintained during the post-closure care period in accordance with Chapter 3745-30 of the Administrative Code, and with the terms and conditions of the permit.

(3) The applicant and/or the person(s) listed as owner and operator if the owner and operator are not the applicant, who has been or is currently responsible for the management or operation of one or more solid waste facilities, has managed or operated such facility in substantial compliance with applicable provisions of Chapters 3704., 3734., 3714., and 6111. of the Revised Code, and any rules, permits or other authorizations issued thereunder, and has maintained substantive compliance with all applicable orders issued by the director, the environmental review appeals commission, or courts having jurisdiction in accordance with Chapter 3746-13 of the Administrative Code, in the course of such previous or current management or operations. The director may take into consideration whether substantial compliance has been maintained with any applicable order from a board of health maintaining a program on the approved list and any other courts having jurisdiction.

(4) The person listed as operator meets the requirements of division (L) of section 3734.02 of the Revised Code and rules adopted thereunder.

(5) The applicant meets the requirements of sections 3734.42 to 3734.44 of the Revised Code and rules adopted thereunder.

(B) Discretionary criteria. The director may consider, when determining whether or not to approve a permit to install application for the residual solid waste landfill facility, the following:

(1) The impact the proposed residual solid waste landfill facility may have on corrective actions that have been taken, are presently being taken, or are proposed to be taken at the facility or in the immediate area.

(2) The technical ability of the owner or operator to adequately monitor the impact

*** DRAFT - NOT YET FILED ***

of the residual solid waste landfill facility on the environment.

(3) The requirement for a separatory liner system constructed in accordance with rule 3745-30-07 of the Administrative Code for a vertical expansion unless the expansion area(s) are to be constructed over an authorized fill area that is underlain by a composite liner or engineered liner previously approved by the director, and a leachate collection system.

(C) Design criteria. The director shall not approve a permit to install application unless the director determines that the application conforms to the appropriate sections of rule 3745-30-07 of the Administrative Code as follows:

(1) New residual solid waste landfill facilities and lateral expansion areas shall comply with paragraphs (B), (C), and (D) of rule 3745-30-07 of the Administrative Code.

(2) Vertical expansion, as defined in rule 3745-27-01 of the Administrative Code, over the residual solid waste landfill facility shall, at a minimum comply with paragraphs (C)(4) to (C)(12) of rule 3745-30-07 of the Administrative Code. Vertical expansion below the residual solid waste landfill facility shall comply with paragraphs (B), (C), and (D) of rule 3745-30-07 of the Administrative Code.

(3) Applications for the residual solid waste landfill facility submitted in response to divisions (A)(3) and (A)(4) of section 3734.05 of the Revised Code shall comply with paragraphs (B), (C), and (D) of rule 3745-30-07 of the Administrative Code, with the exception that filled areas of the residual solid waste landfill facility shall, at a minimum, meet the requirements in paragraphs (C)(4) to (C)(12) of rule 3745-30-07 of the Administrative Code.

(4) Permit to install applications exclusively requesting a change in technique of waste receipt, or type of waste received, or type of equipment used, need not comply with rule 3745-30-07 of the Administrative Code.

(5) Applications exclusively requesting a change in the authorized maximum daily waste receipt (AMDWR) and submitted pursuant to paragraph (E) of this rule need not comply with rule 3745-30-07 of the Administrative Code.

(6) Other modifications of the residual solid waste landfill facility, as that term is defined in rule 3745-27-02 of the Administrative Code shall comply with the relevant sections of rule 3745-30-07 of the Administrative Code.

*** DRAFT - NOT YET FILED ***

(D) [Reserved.]

(E) Additional criteria for authorized maximum daily waste receipt (AMDWR) applications.

The director shall not approve a permit to install application for a permanent change in the AMDWR for the residual solid waste landfill facility whose annual license fee is established pursuant to division (A)(1) of section 3734.06 of the Revised Code, unless the owner or operator demonstrates that the residual solid waste landfill facility can operate in compliance with all applicable solid waste regulations while receiving the requested maximum daily waste receipt. An adequate demonstration for the residual solid waste landfill facility includes, but is not limited to, the following:

(1) An explanation of the overall facility design including construction time frames and fill sequences for the residual solid waste landfill facility.

(2) Operational criteria such as the residual solid waste landfill facility's equipment availability, cover availability, and manpower.

(3) If applicable, the owner's or operator's previous compliance history throughout the life of the residual solid waste landfill facility and the daily logs for any period that the residual solid waste landfill facility was out of compliance.

[Comment: An application for a temporary increase in the AMDWR must satisfy the criteria specified in rule 3745-37-14 of the Administrative Code.]

(F) [Reserved.]

(G) Applicability of siting criteria.

For the purposes of this rule, an "authorized fill area" is an area within the limits of waste placement of the residual solid waste landfill facility that is authorized, by a permit(s) to install, plan approval, operational report, or other authorizing document(s) to accept residual solid waste as of the date of submittal of the permit to install application for a lateral or vertical expansion.

The director shall not approve the permit to install application for the residual solid waste landfill facility unless the director determines that the application meets the criteria specified in paragraph (H) of this rule, as follows:

(1) Call-in permits. The residual solid waste landfill facility for which a permit to

*** DRAFT - NOT YET FILED ***

install application, including any proposed lateral or vertical expansions, is submitted in response to division (A)(3) or (A)(4) of section 3734.05 of the Revised Code, shall meet all the criteria specified in paragraph (H) of this rule; however, the director may approve the application for one or more noncontiguous areas which meet the criteria specified in paragraph (H) of this rule, even though other areas do not meet the criteria specified in paragraph (H) of this rule.

[Comment: The purpose of a call-in permit is to upgrade a facility to the standards in Chapter 3745-30 of the Administrative Code. The review of a call-in permit should be distinguished from a "voluntary" expansion, or AMDWR permit application. Since the call-in process looks at the entire facility, including any expansions proposed in the call-in application, a voluntary application which may be approvable by itself may not be adequate when viewed in the context of the entire facility. It is the applicant's option to submit voluntary vertical or lateral expansions with the call-in application or to submit a voluntary application before the call-in application.]

(2) Operation changes. A permit to install application that exclusively proposes a substantial change in technique of waste receipt, or type of waste received, or type of equipment used at the residual solid waste landfill facility, need not comply with the criteria specified in paragraph (H) of this rule.

(3) AMDWR increase. A permit to install application which exclusively proposes a change in the AMDWR limit for the residual solid waste landfill facility need not comply with the criteria specified in paragraph (H) of this rule.

(4) Other modification permits. A permit to install application that incorporates a "modification" of the residual solid waste landfill facility, as that term is defined in rule 3745-27-02 of the Administrative Code, and the modification does not incorporate a capacity increase or otherwise change the vertical or horizontal limits of waste placement, need not comply with the criteria specified in paragraph (H) of this rule.

(5) Vertical expansion. For the purposes of this rule, a vertical expansion, as defined in rule 3745-27-01 of the Administrative Code, includes the proposed vertical expansion and all waste within the vertical projection above or below the proposed vertical expansion. When evaluating a proposed vertical expansion, the director shall apply the following criteria:

(a) All of the criteria specified in paragraph (H) of this rule, except for paragraph (H)(4) of this rule (general setbacks).

*** DRAFT - NOT YET FILED ***

[Comment: Paragraph (H)(4) of this rule includes setbacks for natural areas, three hundred feet from facility boundary, one thousand feet from domicile, and two hundred feet from surface waters.]

(b) The criteria specified below apply to all areas of the authorized fill area that are contiguous to the proposed vertical expansion but that are not directly above or below the proposed vertical expansion:

(i) Paragraph (H)(1) of this rule (location in national park, etc.).

(ii) Paragraph (H)(2) of this rule (ground water aquifer system protection).

[Comment: Paragraph (H)(2) of this rule includes protection standards for sand or gravel pits, limestone/sandstone quarries, sole source aquifer system, one hundred gpm aquifer system, and isolation distance.]

[Comment: See diagram No. 1 in appendix I of this rule. Vertical expansion permits seek a voluntary vertical change in waste placement boundaries. A decision for final denial of a voluntary vertical expansion permit application does not alter the current authorizing document(s) for the facility. Filling may continue in the authorized fill area in accordance with the applicable authorizing document(s).]

(6) Proposed new landfill or lateral expansion.

A proposed new landfill or lateral expansion of an existing landfill shall meet all of the criteria specified in paragraph (H) of this rule; however, the director may approve the application for one or more noncontiguous areas proposed in the application which meet the criteria specified in paragraph (H) of this rule, even though other proposed areas do not meet the criteria specified in paragraph (H) of this rule.

(7) "Authorized fill area" that is contiguous or noncontiguous to a proposed lateral expansion.

(a) Noncontiguous authorized fill area. When evaluating a proposed lateral expansion, the criteria specified in paragraph (H) of this rule do not apply to an authorized fill area that is noncontiguous with the lateral expansion proposed in the permit to install application.

[Comment: In this situation, the permit to install application proposes a

*** DRAFT - NOT YET FILED ***

lateral expansion of the facility that is not contiguous to the currently permitted fill area (the "authorized fill area"). All siting criteria apply to the "lateral expansion;" no siting criteria apply to the authorized fill area. See diagram no. 2 in appendix I of this rule.]

(b) Contiguous authorized fill area. When evaluating a permit to install application that includes a proposed contiguous new unit(s) without a vertical expansion above or below some or all of the authorized fill areas, the following apply:

[Comment: In the situation addressed in this paragraph, the permit to install application proposes a lateral expansion of the facility that is contiguous to the currently permitted fill area (the "authorized fill area"). All siting criteria apply to the "lateral expansion;" however, paragraphs (G)(7)(b)(i) and (G)(7)(b)(ii) of this rule specify the criteria that apply to the authorized fill area. A final denial decision on the voluntary proposed lateral expansion application does not alter the approval to fill in the authorized fill area.]

(i) When evaluating a proposed lateral expansion, the following criteria specified in paragraph (H) of this rule do not apply to the authorized fill area contiguous with the lateral expansion proposed in the permit to install application:

(a) Paragraph (H)(3) of this rule (ground water setbacks).

(b) Paragraph (H)(4) of this rule (general setbacks).

[Comment: Paragraph (H)(3) of this rule includes setbacks for five year time of travel to public water supply well, underground mines, and one thousand feet from water supply well. Paragraph (H)(4) of this rule includes setbacks for natural areas, three hundred feet from facility boundary, one thousand feet from domicile, and two hundred feet from surface waters.]

(ii) When evaluating a proposed lateral expansion, the following criteria always apply to the authorized fill area contiguous to the lateral expansion in the permit to install application:

(a) Paragraph (H)(1) of this rule (location in national park, etc.).

(b) Paragraph (H)(2) of this rule (ground water aquifer system

*** DRAFT - NOT YET FILED ***

protection).

[Comment: Paragraph (H)(2) includes protection standards for sand or gravel pits, limestone/sandstone quarries, sole source aquifer system, one hundred gpm aquifer system, and isolation distance.]

(c) Contiguous lateral expansion, authorized fill area, and vertical expansion. When evaluating a permit to install application that includes a proposed contiguous lateral expansion and also includes a vertical expansion above or below some or all of the authorized fill area, the following apply:

(i) Evaluate the vertical expansion component of the permit to install application in accordance with paragraph (G)(5) of this rule, and, if it meets the criteria specified in paragraph (G)(5) of this rule, then

(ii) Evaluate the proposed lateral expansion component of the permit to install application and the authorized fill area in accordance with paragraph (G)(7)(b) of this rule.

[Comment: See diagram no. 3 in appendix I of this rule. If the vertical expansion component does not meet the criteria specified in paragraph (G)(5) of this rule, then the applicant may consider revising the application to meet the requirements specified in paragraph (G)(7)(b) of this rule. A final denial decision on this voluntary permit does not alter the filling approved in the authorized fill area.]

(H) Siting criteria.

(1) National parks, national recreation areas, and state parks.

The limits of solid waste placement are not located within one thousand feet of or within any of the following areas, in existence on the date of receipt of the permit to install application by Ohio EPA:

(a) National park or recreation area.

(b) Candidate area for potential inclusion in the national park system.

(c) State park or established state park purchase area.

*** DRAFT - NOT YET FILED ***

(d) Any property that lies within the boundaries of a national park or recreation area but that has not been acquired or is not administered by the secretary of the United States department of the interior.

The one-thousand-foot setback from the limits of solid waste placement does not apply if the applicant obtains a written authorization from the owner(s) and the designated authority of the areas designated in paragraph (H)(1) of this rule to locate the limits of solid waste placement within one thousand feet. Such authorizations must be effective prior to the issuance date of the permit.

[Comment: Pursuant to division (M) of section 3734.02 of the Revised Code, the limits of solid waste placement cannot be located within these areas.]

If the residual solid waste landfill facility is located within a park or recreation area and exclusively disposes of wastes generated within the park or recreation area, this paragraph shall not apply.

(2) Ground water aquifer system protection.

(a) Sand or gravel pit.

The residual solid waste landfill facility is not located in a sand or gravel pit where the sand or gravel deposit has not been completely removed.

For the purposes of this paragraph, a sand or gravel pit is an excavation resulting from a mining operation where the removal of sand or gravel is undertaken for use in another location or for commercial sale. This term does not include excavations of sand or gravel resulting from the construction of the residual solid waste landfill facility.

(b) Limestone or sandstone quarry.

The residual solid waste landfill facility is not located in a limestone quarry or sandstone quarry.

For the purposes of this paragraph, a limestone or sandstone quarry is an excavation resulting from a mining operation where limestone or sandstone is the principal material excavated for use in another location or for commercial sale. This term does not include excavations of limestone resulting from the construction of the residual solid waste landfill facility.

*** DRAFT - NOT YET FILED ***

(c) Sole source aquifer.

The residual solid waste landfill facility is not located above an aquifer declared by the federal government under the Safe Drinking Water Act, 42 U.S.C 300f et. seq. (2003), to be a sole source aquifer prior to the date of receipt of the permit to install application by Ohio EPA.

(d) One hundred gallons per minute (gpm) aquifer system.

The residual solid waste landfill facility is not located above an unconsolidated aquifer system capable of sustaining a yield of one hundred gpm for a twenty-four-hour period to an existing or future water supply well located within one thousand feet of the limits of residual solid waste placement.

(e) Isolation distance.

The isolation distance between the uppermost aquifer system and the bottom of the recompacted soil liner shall comply with the following:

(i) For a class III residual solid waste landfill, the distance shall not be less than five feet of in-situ geologic material, or added geologic material constructed in accordance with rule 3745-30-07 of the Administrative Code.

(ii) For a class II residual solid waste landfill, the distance shall not be less than ten feet of in-situ geologic material, or added geologic material constructed in accordance with rule 3745-30-07 of the Administrative Code.

(iii) For a class I residual solid waste landfill, the distance shall not be less than fifteen feet of in-situ geologic material or added geologic material constructed in accordance with rule 3745-30-07 of the Administrative Code.

(3) Ground water setbacks.

(a) Five year time of travel.

The limits of solid waste placement of the residual solid waste landfill facility and any temporary or permanent leachate ponds or lagoons are not located within the surface and subsurface areas of either of the

*** DRAFT - NOT YET FILED ***

following:

(i) Surrounding an existing or proposed public water supply well through which contaminants may move toward and may reach the public water supply well through underground geologic or man-made pathways within a period of five years.

For the purposes of this paragraph, a proposed public water supply well is a well for which plans have been submitted to Ohio EPA for inclusion in a public water supply system on, or before, the date the permit to install application was received by Ohio EPA and for which a final denial has not been issued.

(ii) A wellhead protection area or a drinking water source protection area for a public water system using ground water.

For purposes of this paragraph a wellhead protection area includes areas near or surrounding a public water supply well or well field as delineated by the owner or operator of the public water supply well or well field and endorsed by Ohio EPA.

For purposes of this paragraph, a drinking water source protection area for a public water system using ground water includes areas near or surrounding a public water supply well or well field as delineated by Ohio EPA. For the purposes of this paragraph, the prohibition against siting in a drinking water source protection area for a public water system using ground water shall not be effective until a map of the delineated area is sent by Ohio EPA and received by the owner or operator of the relevant public water supply well or well field.

[Comment: Information on wellhead protection areas and drinking water source protection area for a public water system using ground water may be obtained from Ohio EPA's division of drinking and ground waters.]

(b) Underground mine.

The residual solid waste landfill facility is not located within an area of potential subsidence due to an underground mine or within the angle of draw of an underground mine in existence on the date of receipt of the permit to install application by Ohio EPA unless the potential impact to the facility due to subsidence is minimized.

*** DRAFT - NOT YET FILED ***

[Comment: Removal or filling of the mines is an acceptable method for minimizing the potential for subsidence.]

(c) One thousand feet from water supply well.

The limits of solid waste placement are not located within one thousand feet of a water supply well or a developed spring in existence on the date the permit to install application was received by Ohio EPA, unless one or more of the following conditions are met:

(i) The water supply well or developed spring is controlled by the applicant and provided the following:

(a) The water supply well or developed spring is needed as a source of nonpotable water in order to meet the requirements of an approved permit or as a source of nonpotable water used in a manufacturing process.

(b) No other reasonable alternate water source is available.

(c) The water supply well or developed spring is constructed to prevent contamination of the ground water.

(ii) The water supply well or developed spring is at least five hundred feet hydrogeologically upgradient of the limits of residual solid waste placement and the applicant demonstrates that the potential for migration of landfill gas to that well or developed spring is minimized.

[Comment: If the applicant does not meet the demonstration, then the water supply well or developed spring must be located at least one thousand feet hydrogeologically upgradient of the limits of solid waste placement.]

[Comment: Constructing a landfill with a bottom liner system or an active gas management system is an acceptable means to minimize the potential for gas migration.]

(iii) The water supply well or developed spring is separated from the limits of residual solid waste placement by a hydrogeologic barrier.

*** DRAFT - NOT YET FILED ***

(iv) The water supply well or developed spring was constructed and is used solely for monitoring ground water quality.

For the purposes of this paragraph, a developed spring is any spring that has been permanently modified by the addition of pipes or a collection basin to facilitate the collection and use of the spring water.

(4) General setbacks.

(a) One thousand feet from natural areas.

The limits of solid waste placement are not located within one thousand feet of the following, that are in existence on the date of receipt of the permit to install application by Ohio EPA:

(i) Areas designated by the Ohio department of natural resources as either a state nature preserve, including all lands dedicated under the Ohio natural areas law, a state wildlife area, or a state wild, scenic or recreational river.

(ii) Areas designated, owned, and managed by the Ohio historical society as a nature preserve.

(iii) Areas designated by the United States department of the interior as either a national wildlife refuge or a national wild, scenic or recreational river.

(iv) Areas designated by the United States forest service as either a special interest area or a research natural area in the Wayne national forest.

(v) Stream segments designated by Ohio EPA as either a state resource water, a coldwater habitat, or an exceptional warmwater habitat.

[Comments: Stream segments designated as state resource waters may include some wetlands. Those wetlands that do not meet this designation are addressed in paragraph (H)(4)(d) of this rule.]

(b) Three hundred feet from property line.

The limits of solid waste placement are not located within three hundred feet of the residual solid waste landfill facility's property line.

*** DRAFT - NOT YET FILED ***

(c) One thousand feet from domicile.

For residual solid waste landfills which dispose of residual solid waste as identified in paragraph (B)(3) of rule 3745-30-01 of the Administrative Code but which are not owned by a generator who disposes exclusively of residual solid waste generated on one or more premises owned by the generator, the limits of solid waste placement are not located within one thousand feet of a domicile, whose owner has not consented in writing to the location of the residual solid waste landfill facility, in existence on the date of receipt of the permit to install application by Ohio EPA.

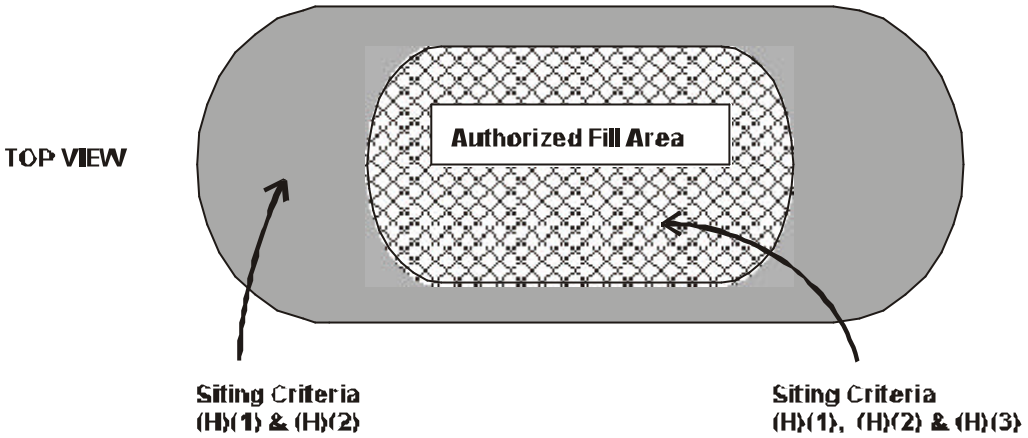
(d) Two hundred feet from surface waters.

The limits of solid waste placement are not located within two hundred feet of areas determined by Ohio EPA or the United States army corps of engineers to be a stream, lake, or wetland.

(5) The residual solid waste landfill facility is not located in a floodway, and the limits of solid waste placement and the leachate management system of the residual solid waste facility are not located in a regulatory flood plain.

[Comment: Pursuant to division (A) or (G) of section 3734.02 of the Revised Code or rule 3745-30-15 of the Administrative Code, an applicant may request an exemption or variance from any of the siting criteria contained in this rule. However, pursuant to division (M) of section 3734.02 of the Revised Code, the director shall not issue a permit, variance or exemption that authorizes a new residual solid waste landfill facility, or an expansion of an existing residual solid waste landfill facility, within the boundaries of the areas indicated in paragraph (H)(1) of this rule.]

APPENDIX I
DIAGRAM 1
VERTICAL EXPANSIONS



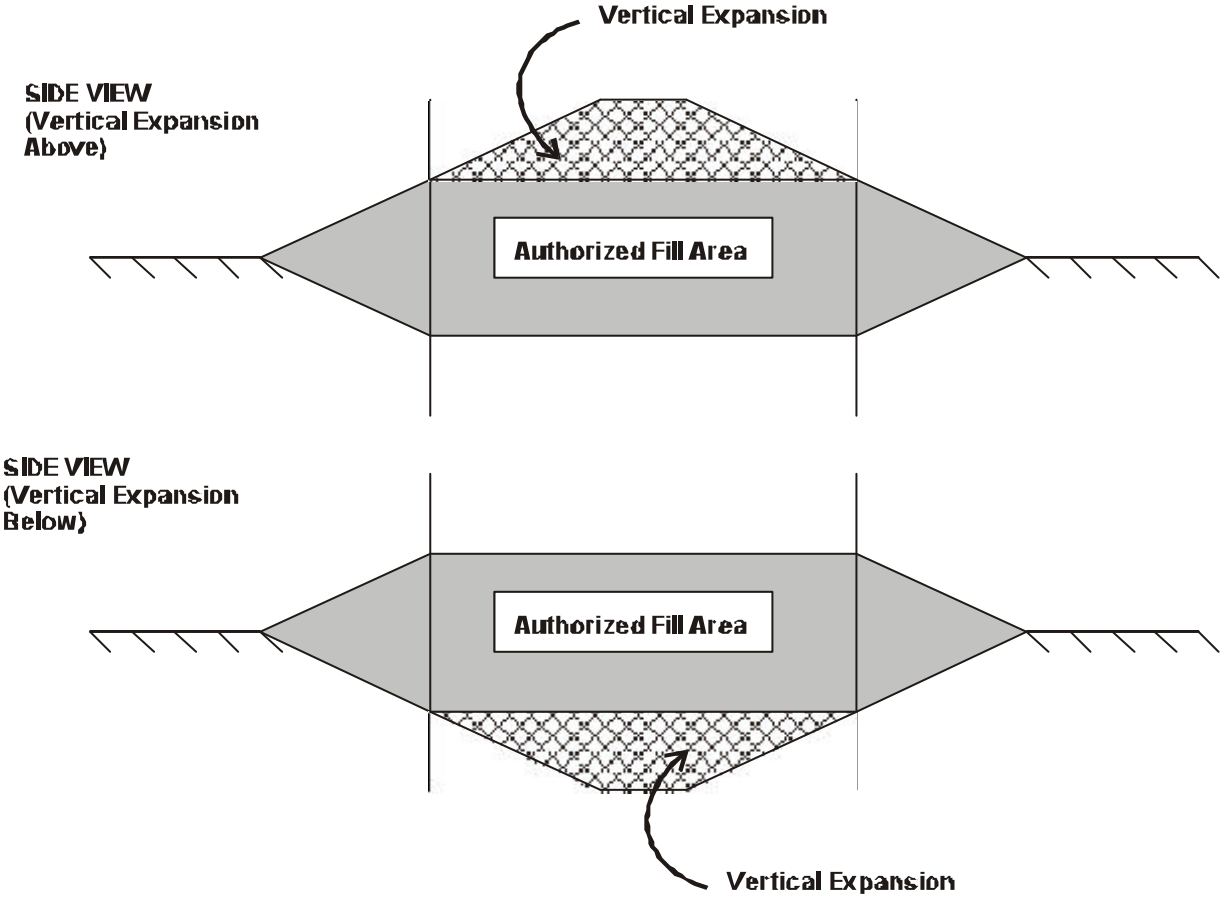
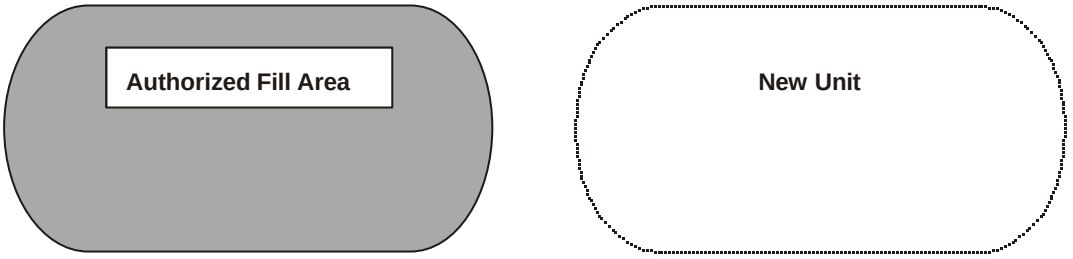


DIAGRAM 2
NONCONTIGUOUS UNITS

TOP VIEW



NO Siting Criteria Apply

ALL Siting Criteria Apply
(H)(1), (H)(2), (H)(3) & (H)(4)

SIDE VIEW

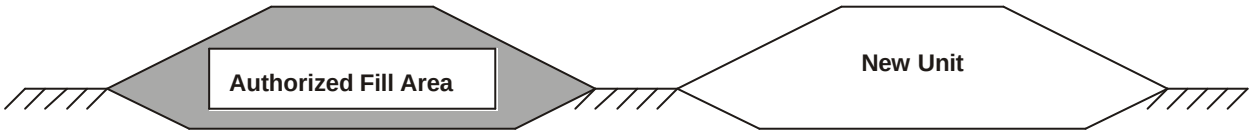
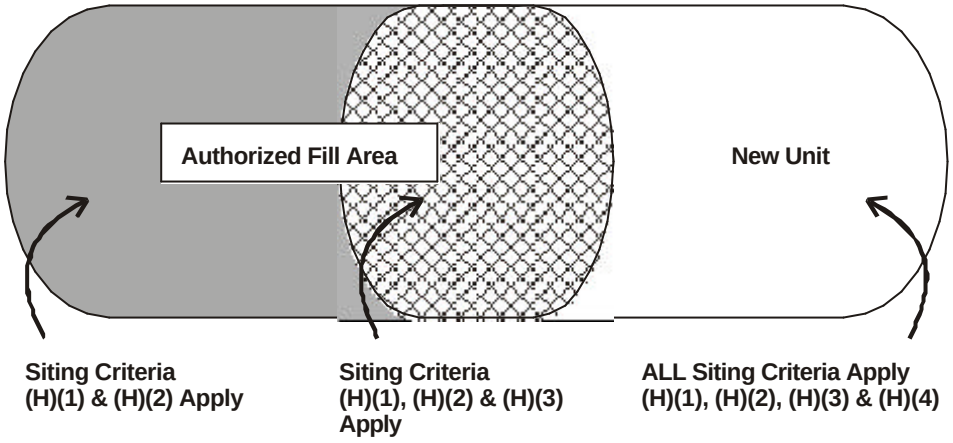
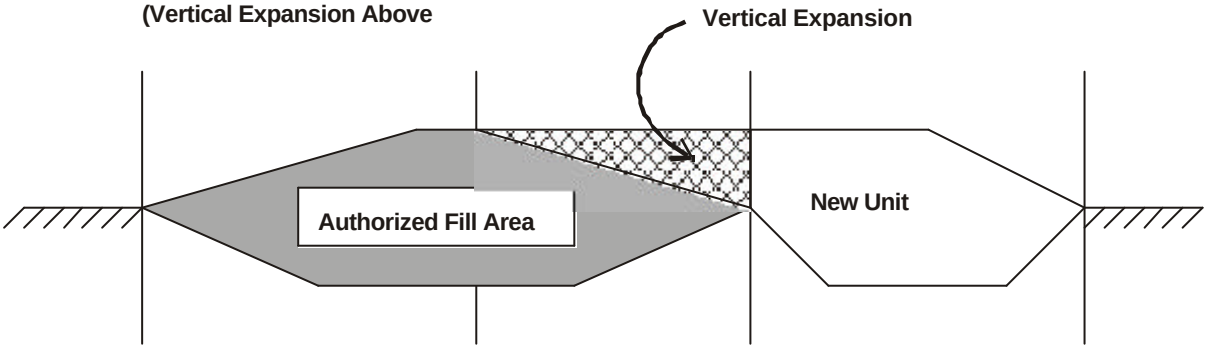


DIAGRAM 3
CONTIGUOUS NEW UNIT WITH VERTICAL EXPANSION

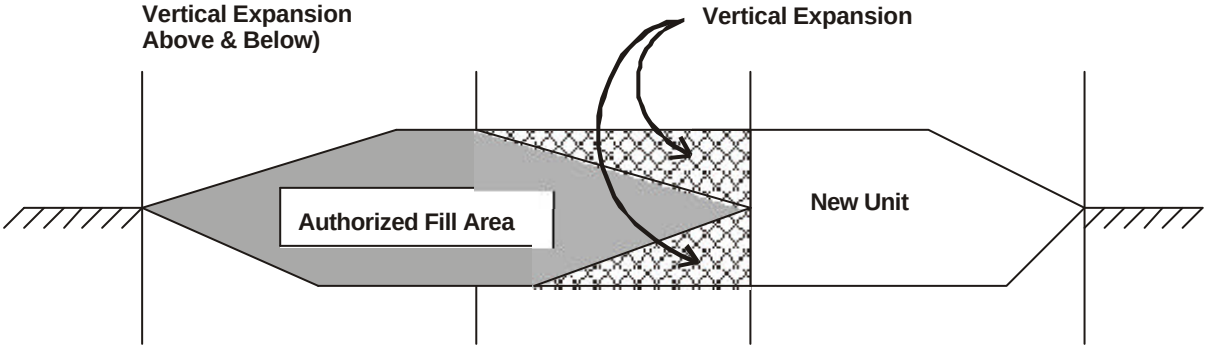
TOP VIEW



SIDE VIEW
(Vertical Expansion Above



SIDE VIEW
Vertical Expansion
Above & Below)



Appendix II

TYPE OF PERMIT		SITING CRITERIA 3745-30-06(H)												
			GW Aquifer Protection					GW Setbacks			General Setbacks			
		nat'l parks (1)	sand gravel (2)(a)	quarry (2)(b)	sole source (2)(c)	100 gpm (2)(d)	15' sep. (2)(e)	5 yr. TOT (3)(a)	mine (3)(b)	1000' well (3)(c)	1000' wildlife (4)(a)	prop. line (4)(b)	1000' house (4)(c)	200' waters (4)(d)
(G)(1)	call-in permit (includes all expansion areas proposed in application)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
(G)(2)	operational changes	no	no	no	no	no	no	no	no	no	no	no	no	no
(G)(3)	AMDWR	no	no	no	no	no	no	no	no	no	no	no	no	no
(G)(4)	other modifications w/o capacity or change to waste boundaries	no	no	no	no	no	no	no	no	no	no	no	no	no
(G)(5)(a)	vertical expansion	yes	yes	yes	yes	yes	yes	yes	yes	yes	no	no	no	no
(G)(5)(b)	AFA not above/below vertical expansion but contiguous to VE	yes	yes	yes	yes	yes	yes	no	no	no	no	no	no	no
(G)(6)	proposed new unit (lateral expansion and new landfill)	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
(G)(7)(a)	noncontiguous AFA	no	no	no	no	no	no	no	no	no	no	no	no	no
(G)(7)(b)	contiguous AFA	yes	yes	yes	yes	yes	yes	no	no	no	no	no	no	no
(G)(7)(c)	combination of proposed new unit and vertical expansion of a contiguous AFA	Evaluate the vertical expansion to determine if it meets the criteria in paragraph (G)(5), then, if the vertical expansion meets the criteria, evaluate the proposed new unit.												

"AFA" means authorized fill area
"AMDWR" means authorized maximum daily waste receipt
"VE" means vertical expansion

*** DRAFT - NOT YET FILED ***

3745-30-07 **Residual waste landfill facility construction.**

The permittee shall contact the health department (if on the approved list as specified in rule 3745-37-08 of the Administrative Code) and Ohio EPA prior to commencing construction of each phase of the residual waste landfill facility for the purpose of inspection.

(A) The permittee shall not accept residual waste in any phase of the residual waste landfill facility until construction of that phase has been certified in accordance with paragraph (B) of this rule, inspected by the health commissioner (if on the approved list as specified in rule 3745-37-08 of the Administrative Code) and by the director or their authorized representatives, and written concurrence has been received from the director or his authorized representative that construction is in compliance with the permit to install and the approved permit to install application.

(B) Upon installation of the items in paragraph (H)(2) of this rule in each phase of the residual waste landfill facility, a certification report, prepared by a professional skilled in the appropriate discipline(s), shall be submitted to the Ohio EPA and to the health department (if on the approved list as specified in rule 3745-37-08 of the Administrative Code). The certification report shall include the following:

(1) Results of all testing required by this rule or required by the approved permit to install.

(2) Any deviations from the permit to install or the approved permit to install application.

(3) Record drawings showing the following:

(a) Plan views with test locations.

(b) Cross sections.

(c) Necessary details.

(4) A notarized statement that, to the best of the knowledge of the permittee, the certification report is true, accurate, and contains all information required by paragraph (B) of this rule.

The initial certification report shall also contain copies of permits in fulfillment of requirements in paragraph (K) of rule 3745-30-14 of the Administrative Code.

*** DRAFT - NOT YET FILED ***

(C) The following specifications in design and construction of the residual waste landfill facility shall be used whenever the features in this paragraph are required by paragraph (E) of rule 3745-30-06 of the Administrative Code.

(1) A recompacted soil liner, at a minimum, shall comply with the following:

(a) Be constructed using loose lifts eight inches thick or less to achieve uniform compaction. Each lift shall have a maximum permeability of 1 x 10^{-7} cm/sec.

(b) Be constructed of a soil with a maximum clod size of three inches or half the lift thickness, whichever is less.

(c) Be constructed of a soil as follows:

(i) With one hundred per cent of the particles having a maximum dimension not greater than two inches.

(ii) With not more than ten per cent of the particles, by weight, having a dimension greater than 0.75 inches.

(iii) With not less than fifty per cent of the particles, by weight, passing through the 200-mesh sieve.

(iv) With not less than twenty-five per cent of the particles, by weight, having a maximum dimension not greater than 0.002 millimeters.

(d) Be compacted to at least ninety-five per cent of the maximum "standard proctor density" using ASTM D698-00A or at least ninety per cent of the maximum "modified proctor density" using ASTM D1557-00.

(e) Be compacted at a moisture content at or wet of optimum.

(f) Not be comprised of solid waste.

(g) Be constructed using the number of passes and lift thickness, and the same or similar type and weight of compaction equipment established by testing required in paragraph (F) of this rule.

(h) Be placed on the bottom and exterior excavated sides of the landfill and

*** DRAFT - NOT YET FILED ***

have a minimum bottom slope of two per cent and a maximum slope based on the following:

(i) Compaction equipment limitations.

(ii) Slope stability.

(iii) Maximum friction angle between any soil-geosynthetic interface and between any geosynthetic-geosynthetic interface.

(iv) Resistance of geosynthetic and geosynthetic seams to tensile forces.

(i) Be constructed on a prepared surface that shall comply with the following:

(i) Be free of debris, foreign material, and deleterious material.

(ii) Be able to bear the weight of the landfill and its construction and operations without causing or allowing a failure of the liner to occur through settling.

(iii) Not have any abrupt changes in grade that may result in damage to geosynthetics.

(j) Be designed and constructed to comply with the following:

(i) Be at least one and one half feet thick for a class III residual waste landfill or at least three feet thick if no flexible membrane liner is proposed in accordance with paragraph (C)(2) of this rule.

(ii) Be at least three feet thick for a class II residual waste landfill. The director may approve an alternative thickness to be no less than one and one half feet, based on the result of the calculations outlined in appendix I of this rule.

(iii) Be at least five feet thick for class I residual waste landfill. The director may approve an alternate thickness, to be no less than three feet, based on the result of the calculations outlined in appendix I of this rule.

To allow for alternate technologies, the director may approve an

*** DRAFT - NOT YET FILED ***

alternate thickness based on a design that is no less protective of human health and the environment.

(k) Have a factor of safety for hydrostatic uplift not less than 1.4.

(l) Be adequately protected from damage due to desiccation, freeze/thaw cycles, wet/dry cycles, and the intrusion of objects during construction and operation.

Alternatives for paragraphs (C)(1)(a) to (C)(1)(e) of this rule may be used if it is demonstrated to the satisfaction of the director or his authorized representative that the materials and techniques will result in each lift having a maximum permeability of 1×10^{-7} cm/sec.

(2) A flexible membrane liner, placed on the recompacted soil liner, shall comply with the following:

(a) Be negligibly permeable to fluid migration.

(b) Be physically and chemically resistant to chemical attack by the residual waste, leachate, or other materials which may come in contact with the flexible membrane liner.

(c) Be seamed to allow no more than negligible amounts of leakage; the seaming material shall be physically and chemically resistant to chemical attack by the residual waste, leachate, or other materials that may come in contact with the seams.

(d) Have properties for its installation and use which are acceptable to the director.

(e) Be protected from the drainage layer by a cushion layer as required by the director.

A flexible membrane liner is not required for a class III residual waste landfill which incorporates a recompacted soil liner at least three feet thick in accordance with paragraph (C)(1)(j)(i) of this rule.

To allow for alternate technologies, the director may approve a design which does not incorporate a flexible membrane liner if the design will be no less protective of human health and the environment.

*** DRAFT - NOT YET FILED ***

(3) A leachate management system shall be designed to do the following:

(a) To contain and collect leachate within the boundary of the residual waste landfill flexible membrane liner and/or soil liner.

(b) To limit the level of leachate in areas other than lift stations to a maximum of one foot. Any granular material used as a drainage medium shall have a permeability no less than 1×10^{-3} cm/sec.

(c) To function without clogging. A filter layer may be required by the director.

(d) To prevent crushing of or damage to, any of its components. A protective layer, to protect the leachate management system and the residual waste landfill liner components from the intrusion of objects during construction and operation, which may consist of select residual waste, may be required by the director.

(e) To be chemically resistant to attack by the residual waste, leachate, or any other material it may contact.

(f) To convey and store leachate outside the limits of solid waste placement, such that:

(i) Any leachate conveyance or storage structures located outside the limits of solid waste placement shall be no less protective of the environment than the residual waste landfill, as determined by the director.

(ii) Be monitored if required by the director.

(iii) For storage tanks, be provided with spill containment.

(iv) For leachate pipelines, be double-cased.

(v) For storage structures, have a minimum of one week of storage capacity, calculated using design assumptions which simulate a final cap system completed in accordance with rule 3745-30-09 of the Administrative Code.

*** DRAFT - NOT YET FILED ***

(g) To treat and dispose of leachate in accordance with one of the following:

(i) Leachate is either treated and disposed on site at the residual waste landfill facility.

(ii) Leachate is pretreated on-site and transported or piped off-site for final treatment and disposal.

(iii) Leachate is transported or piped off-site for treatment and disposal.

A contingency plan for the treatment and disposal of leachate shall be developed describing the immediate and long-term steps, to include the identification of available back-up treatment facilities, if applicable, and for new residual waste landfill facilities which propose off-site treatment, to include the identification of on-site land for the construction and operation of an on-site treatment facility in the event that leachate cannot be treated and disposed in accordance with the option proposed in the permit to install application.

If, at any time, leachate is evaluated to be hazardous in accordance with rule 3745-52-11 of the Administrative Code, it shall be managed in accordance with Chapters 3745-50 to 3745-69 of the Administrative Code, and the generator standards for storage shall apply in accordance with Chapter 3745-52 of the Administrative Code.

(4) Surface water control structures.

(a) Any permanent surface water control structures shall be designed to accommodate, by non-mechanical means, the peak flow from the twenty-five-year/twenty-four-hour storm event.

(b) Any temporary surface water control structures shall be designed to accommodate the peak flow from the twenty-five-year/twenty-four-hour storm event.

(c) Surface water control structures shall be designed to minimize silting and scouring.

(d) Any sedimentation ponds shall be designed and constructed in accordance with the following:

*** DRAFT - NOT YET FILED ***

(i) Minimum storage volume shall be provided based on either the calculated runoff volume from a ten-year/twenty-four-hour storm event, or 0.125 acre-feet per year, for each acre of disturbed area within the upstream drainage area, multiplied by the scheduled frequency of pond clean-out (in years), whichever is greater.

(ii) The principal spillway shall safely discharge the flow from a ten-year/twenty-four-hour storm event. The inlet elevation of the emergency spillway shall be designed to provide flood storage, with no flow entering the emergency spillway, for a twenty-five-year/twenty-four-hour storm event, with allowance provided for the flow passed by the principal spillway during the event.

(iii) The combination of principal and emergency spillways shall safely discharge the flow from a one-hundred-year/twenty-four-hour storm event. The embankment design shall provide for no less than one foot net freeboard when flow is at the design depth, after allowance for embankment settlement.

(iv) The sedimentation pond shall be constructed using a recompacted soil liner, a flexible membrane liner, or a combination thereof, based on a design acceptable to the director.

(5) For survey marks: for survey marks: at least three permanent survey marks, with each located on separate sides of the proposed sanitary landfill facility, shall be established prior to any construction and within easy access to the limits of solid waste placement in accordance with the following:

(a) Survey marks shall be referenced horizontally to the 1927 North American Datum, 1983 North American Datum, or State Plane Coordinate System and vertically to the 1929 or 1988 North American Vertical Sea Level Datum as identified on the 7.5 minute series quadrangle sheets published by the United States geological survey.

(b) Survey marks shall be at least as stable as a poured concrete monument ten inches in diameter installed to a depth of forty-two inches below the ground surface. Each constructed survey mark shall include a corrosion resistant metallic disk which indicates horizontal and vertical coordinates of the survey mark and shall contain a magnet or ferromagnetic rod to allow identification through magnetic detection methods.

*** DRAFT - NOT YET FILED ***

(c) Survey control standards for the survey marks shall be in accordance with the following:

(i) For the first facility survey mark established from the known control point, minimum horizontal distance accuracy shall be one foot horizontal to two thousand five hundred feet horizontal.

(ii) For each facility survey mark established from the first facility survey mark, minimum horizontal accuracy shall be one foot horizontal distance to five thousand feet horizontal.

(iii) For the first facility survey mark established from the known control point and for each facility survey mark established from the first facility survey mark, minimum vertical accuracy shall be one inch to five thousand feet horizontal.

(6) Grades of access roads shall not exceed twelve per cent. All access roads shall be designed to allow passage of loaded vehicles during all weather conditions with minimum erosion and dust generation and with adequate drainage.

(7) Any permanent ground water control structures shall adequately control ground water infiltration through the use of non-mechanical means such as impermeable barriers or permeable drainage structures. However, no permanent ground water control structures may be used to dewater an aquifer system, unless the aquifer system exists only under the property owned or leased by the permittee of the residual waste landfill facility, or it can be demonstrated to the satisfaction of the director that no adverse social or economic impact will occur.

(8) Any explosive gas monitoring systems shall be designed and constructed in accordance with paragraph (E) of rule 3745-27-12 of the Administrative Code.

(9) Any explosive gas control structures shall be designed so that explosive gas cannot travel laterally from the residual waste landfill facility or accumulate in occupied structures. Explosive gas control/extraction systems shall be designed in such a manner as to prevent fires within the limits of residual waste placement. Construction of the explosive gas control/extraction systems shall not compromise the integrity of the cap system, the leachate management system, or the recompacted soil liner.

(10) A residual waste landfill facility located within a geologically unstable area,

*** DRAFT - NOT YET FILED ***

other than in an area of potential subsidence resulting from underground mining, shall be designed to resist the earth movement at the site. Geologically unstable areas include any of the following:

(a) Where on-site or local soil conditions result in significant differential settling.

(b) Where the downslope movement of soil or rock due to gravitational influence occurs.

(c) Where the lowering or collapse of the land surface occurs either locally or over broad regional areas.

(11) The design for the stability of all engineered components and the waste mass shall address any configuration throughout the applicable development and post closure periods. Potential failures associated with internal, interim and final slopes as these slopes are defined in rule 3745-30-05 of the Administrative Code, shall be used to define the minimum construction specifications and materials that, at a minimum, will meet the following:

(a) The factor of safety for hydrostatic uplift shall not be less than 1.40 at any location during the construction and operation of the facility.

(b) The factor of safety for bearing capacity of any vertical sump risers on the composite liner system shall not be less than 3.0.

(c) The factor of safety for static slope stability shall not be less than 1.50 using two dimensional limit equilibrium methods or another factor of safety using a method acceptable to the director when assessed for any of the following failure modes and conditions:

(i) Deep-seated translational and deep-seated rotational failure mechanisms of internal slopes, interim slopes, and final slopes for drained conditions and as applicable conditions representing the presence of excess pore water pressure at the onset of loading or unloading. For slopes containing geosynthetic interfaces placed at grades greater than 5.0 percent, residual shear strength conditions shall be used for any soil to geosynthetic or geosynthetic to geosynthetic interfaces.

[Comment: Ohio EPA considers any failure that occurs through a material or along an interface that is loaded with more than 1,440

*** DRAFT - NOT YET FILED ***

pounds per square foot to be a deep seated failure mode.]

(ii) Shallow translational and shallow rotational failure mechanisms of internal slopes and final slopes for unsaturated conditions.

[Comment: Peak shear strengths can be used for most shallow failure modes.]

(d) The factor of safety for seismic slope stability shall not be less than 1.00 using two or three dimensional limit equilibrium methods, or another factor of safety using a method acceptable to the director when assessed for any of the following failure modes and conditions:

(i) Deep-seated translational and deep-seated rotational failure mechanisms of final slopes for drained conditions and as applicable conditions representing the presence of excess pore water pressure at the onset of loading or unloading. For slopes containing geosynthetic interfaces placed at grades greater than 5.0 percent, residual shear strength conditions shall be used for any soil to geosynthetic or geosynthetic to geosynthetic interfaces.

If required by the director, deep-seated translational and deep-seated rotational failure mechanisms of interim and internal slopes for drained conditions and as applicable conditions representing the presence of excess pore water pressure at the onset of loading or unloading. For slopes containing geosynthetic interfaces placed at grades greater than 5.0 percent, residual shear strength conditions shall be used for any soil to geosynthetic or geosynthetic to geosynthetic interfaces.

(ii) Shallow translational and shallow rotational failure mechanisms of final slopes for unsaturated conditions.

(e) The factor of safety against liquifaction shall not be less than 1.00 for internal slopes, interim slopes and final slopes.

(f) The factor of safety for static slope stability shall not be less than 1.10 using two dimensional limit equilibrium methods or other methods acceptable to the director when assessed for any of the following failure modes and conditions:

(i) If required by the director, shallow translational and shallow

*** DRAFT - NOT YET FILED ***

rotational failure mechanisms of internal slopes in which the protective soils over the leachate collection layer have reached field capacity. Calculations shall use the maximum head predicted for the fifty year, one hour design storm.

(ii) Shallow translational and shallow rotational failure mechanisms of final slopes in which the cover soils over the drainage layer have reached field capacity. Calculations shall use the maximum head predicted for the one hundred year, one hour design storm.

[Comment: The number of digits after the decimal point indicates that rounding can only occur to establish the last digit. For example, 1.485 can be rounded to 1.49, but not 1.5 or 1.50.]

(12) Any oil wells and gas wells within the proposed limits of residual waste placement shall be properly plugged and abandoned in accordance with 1509. of the Revised Code.

(D) Prior to being used in construction of the recompacted soil liner required by paragraph (C) of this rule and the recompacted soil barrier layer required by paragraph (F)(3) of rule 3745-30-09 of the Administrative Code, and in any proposed drainage medium, the following characteristics of the earthen materials shall be determined to show that the material is suitable for use in construction of the residual waste landfill facility:

(1) For the soil material, all of the following:

(a) Recompacted permeability at construction specifications.

(b) Moisture content and density using an approved ASTM method.

(c) Grain size distribution using ASTM D422-63 for sieve and hydrometer methods.

(d) Atterberg limits using ASTM D4318-00.

Each of the above tests shall be performed on representative samples at least once for every one thousand five hundred cubic yards of soil, except the test outlined in paragraph (D)(1)(a) of this rule, which shall be performed at least once for every ten thousand cubic yards of soil.

*** DRAFT - NOT YET FILED ***

(2) For any granular drainage material, to be tested at least once for every three thousand cubic yards of material for the following:

(a) Permeability.

(b) Grain size distribution using ASTM D422-63 for the sieve method.

(3) Chemical compatibility testing may be required by the director.

At the request of the health commissioner or the director, or their authorized representatives, results of testing required in this paragraph shall be made available for inspection.

(E) Prior to the installation of the geosynthetics, other synthetic materials, and joint sealing compounds used in the construction of the flexible membrane liner or any other component of the residual waste landfill, they shall comply with the following:

(1) Be shown to be physically and chemically resistant to attack by the residual waste, leachate, or other materials that they may come in contact with using USEPA method 9090 or other documented data.

(2) Be shown to have properties acceptable for installation and use.

(F) The following activities shall be performed to ensure that the appropriate components of the residual waste landfill facility are constructed to meet the specifications of this rule:

(1) The recompacted soil liner and the recompacted soil barrier layer in the cap system shall be modeled by the construction of test pads. Test pads shall comply with the following:

(a) Be designed such that the proposed tests are appropriate and their results are valid.

(b) Be constructed to establish the construction details, or verify or amend the construction details proposed in the approved permit, which are necessary to obtain sufficient compaction to satisfy the permeability requirement. The construction details include such items as the lift thickness, the water content necessary to achieve the desired compaction, and the type, weight, and number of passes of construction

*** DRAFT - NOT YET FILED ***

equipment.

(c) Be constructed prior to the construction of the residual waste landfill component which the test pad will model.

(d) Be constructed whenever there is a significant change in soil material properties.

(e) Have a minimum width three times the width of compaction equipment, and a minimum length two times the length of compaction equipment, including power equipment and any attachments.

(f) Be comprised of at least four lifts.

(g) Be tested for field permeability, following the completion of test pad construction, using methods acceptable to the director. For each lift, a minimum of three tests for moisture content and density shall be performed.

(h) Be reconstructed as many times as necessary to meet the permeability requirement. Any amended construction details shall be noted for future soil liner or soil barrier layer construction.

An alternative to test pads may be used if it is demonstrated to the satisfaction of the director or his authorized representative that the alternative meets the requirements of this paragraph.

(2) If test pad results necessitate amended construction details, as outlined in paragraph (F)(1)(h) of this rule, the amended construction details shall replace the appropriate construction details from the approved permit to install. The residual waste landfill component that the test pad modeled shall be constructed using the amended construction details. These amendments shall be explicitly outlined in the construction certification report required by paragraph (B) of this rule.

(3) Moisture content and density testing of the recompacted soil liner and recompacted soil barrier in the cap system shall be performed at a frequency of no less than five tests per acre per lift.

(a) Any penetrations shall be repaired using methods acceptable to the director.

*** DRAFT - NOT YET FILED ***

(b) For facilities disposing of residual wastes as identified in paragraph (B)(4) of rule 3745-30-01 of the Administrative Code, any significant differences between the results of the tests required by paragraph (F)(3) of this rule and the results of similar tests performed on the approved test pad required by paragraph (F)(1) of this rule shall be justified by the permittee in the construction certification report required by paragraph (B) of this rule. In determining whether reconstruction of the recompacted soil liner or soil barrier layer in the cap system is necessary when a significant difference exists, the director shall consider the magnitude of the difference and the justification provided by the permittee. If a justification for different density test results involving the recompacted soil barrier layer in a cap system cites inferior compactability due to a residual waste subbase, the director shall consider what density values are practically attainable in compaction of soil on that subbase before requiring reconstruction of the soil barrier layer.

(4) Flexible membrane liners shall be tested, using methods acceptable to the director, as follows:

(a) For the purpose of testing every seaming apparatus in use each day, peel and shear tests shall be performed on scrap pieces of flexible membrane liner at the beginning of the seaming period and every four hours thereafter.

(b) Nondestructive testing shall be performed on one hundred per cent of the flexible membrane liner seams.

(c) Destructive testing for peel and shear shall be performed at least once for every five hundred feet of seam length. An alternate means may be used if it is demonstrated to the satisfaction of the director or his authorized representative that the alternate means meets the requirements of this paragraph.

(G) Failed tests. All quality assurance/quality control tests failing to meet the specifications outlined in this rule must be investigated. An area with a verified failure must be reconstructed to meet specifications. Reconstructed areas shall be retested at a frequency acceptable to the director.

(H) Quality assurance/quality control.

(1) A quality assurance/quality control plan for construction shall include the

*** DRAFT - NOT YET FILED ***

following:

(a) Sampling and testing procedures to be used in the field and in the laboratory.

(b) Testing frequency.

(c) Parameters and sample locations.

(d) Procedures to be followed if a test fails.

(e) The management structure and the experience and training of the testing personnel.

(f) Contingency plan for anticipated construction difficulties.

(2) The quality assurance/quality control plan shall certify the design and construction of any of the following items which are incorporated into the residual waste landfill design:

(a) In-situ foundation preparation.

(b) Recompacted soil liner system.

(c) Flexible membrane liner.

(d) Leachate collection and management system.

(e) Cap system.

(f) Permanent ground water control structures.

(g) Explosive gas control, extraction and monitoring systems.

(h) Permanent surface water control structures.

(i) Permanent haul roads.

*** DRAFT - NOT YET FILED ***

(j) Test pad.

(k) Other engineered components required by the approved permit or other authorizing document.

Appendix I

Equation (1) D = N * (6.6×10^{-9}) where:

D = Liner thickness (ft), not to exceed 5 feet for facilities regulated in accordance with paragraph (C)(1)(j)(iii) of this rule and not to exceed 3 feet for facilities regulated in accordance with paragraph (C)(1)(j)(ii) of this rule.

N = time (seconds), calculated in procedure (3)

Equation (2) T = D/AK where:

T = time (seconds)
D = thickness of geologic stratum (cm)
K = hydraulic conductivity of geologic stratum (cm/sec)
A = constant determined by type of geologic stratum where:

A = 2.0 for clay
A = 2.5 for silt
A = 3.5 for sand or gravel
A = 5.0 for fractured bedrock
A = the inverse of the porosity of the non- fractured bedrock material

Procedure:

(1) Calculate T for each geologic stratum that is to be present between the uppermost aquifer system and the base of the recompacted soil liner using equation (2).

(2) The values for T calculated in procedure (1) shall be summed to yield T for the entire section between the uppermost aquifer system and the base of the recompacted soil liner.

(3) Subtract T from 7.9 x 108 seconds to get N (seconds).

(4) Insert N into equation (1) to determine required liner thickness

*** DRAFT - NOT YET FILED ***

3745-30-08 Ground water monitoring program.

(A) Applicability.

(1) The owner or operator, of any new residual or industrial solid waste landfill facility, of all lateral and vertical expansions of any existing residual or industrial solid waste landfill facility, of any facility where the owner or operator is required to submit a permit to install application in response to division (A)(3) or (A)(4) of section 3734.05 of the Revised Code, and of any landfill facility undergoing closure according to rule 3745-30-09 of the Administrative Code or rule 3745-29-11 of the Administrative Code, shall implement and maintain a ground water monitoring program capable of determining the impact of the landfill facility on the quality of ground water occurring within the uppermost aquifer system and all significant zones of saturation above the uppermost aquifer system underlying the landfill facility. The ground-water monitoring program shall comply with paragraphs (B) to (F) of this rule and shall be protective of human health and safety and the environment. The ground water monitoring program shall be documented as a written ground water monitoring program plan and submitted to the director as part of a landfill facility's permit to install application or closure plan. The ground water monitoring program plan shall describe the owner or operator's program and how the plan complies with this rule. The ground water monitoring program shall be implemented when the director issues final approval of the permit to install application or closure plan. The owner or operator shall use the methods documented in the plan. Changes to an approved plan shall be submitted to Ohio EPA sixty days before implementation of those changes.

(2) The owner or operator of an industrial solid waste landfill facility, permitted and operating under Chapter 3745-29 of the Administrative Code, subject to any operational requirements in rule 3745-29-19 of the Administrative Code, subject to any closure requirements in rule 3745-29-11 of the Administrative Code, or subject to any post-closure requirements in rule 3745-29-14 of the Administrative Code, shall comply with the requirements of this rule and as follows:

(a) A ground water monitoring plan previously submitted as part of an industrial solid waste landfill facility permit to install or closure plan shall be revised to comply with this rule and submitted to Ohio EPA within two hundred seventy days after the effective date of this rule. The previously submitted plan shall remain in effect until sixty days after the revised plan is submitted.

(b) Unless otherwise ordered, an alternate parameter list previously approved by the director or his authorized representative shall remain in effect.

*** DRAFT - NOT YET FILED ***

[Comment: The owner/operator of an industrial solid waste landfill regulated under rule 3745-29-10 of the Administrative Code is only required to revise the portions of their current ground water monitoring plan that do not comply with this rule and are not required to submit a whole new plan. All variance approvals issued per rule 3745-29-10 of the Administrative Code continue in effect.]

(c) A permit applicant acting to comply with paragraph (C)(3)(e) of rule 3745-29-06 of the Administrative Code shall analyze the ground water for all of the parameters in appendix III (H) of this rule.

(d) An owner or operator acting to comply with paragraph (M)(5) of rule 3745-29-19 of the Administrative Code shall analyze the leachate for all of the parameters in appendix III (H) of this rule.

(B) Monitoring system.

(1) The ground water monitoring system shall include a sufficient number of wells, installed at appropriate locations and depths, to yield ground water samples from both the uppermost aquifer system and any significant zones of saturation that exist above the uppermost aquifer system that do the following:

(a) Represent the quality of the ground water that has not been affected by past or present operations at the landfill facility.

(b) Represent the quality of the ground water passing directly downgradient of the limits of solid waste placement.

(c) Based on site-specific situations, surface water monitoring of seeps, springs, or streams in addition to or as a partial alternative to the ground water monitoring may be proposed by the owner or operator or may be required by the director.

[Comment: The director's authorization to conduct surface water monitoring under this rule should include provisions for: sampling procedures; constituents to be analyzed; and analyzing the resulting data.]

(2) Where the uppermost aquifer system exists more than one hundred fifty feet beneath base of the waste or the recompacted clay liner of the landfill facility, the ground water monitoring system shall consist of a sufficient number of wells, installed at appropriate locations and depths, to yield ground water

*** DRAFT - NOT YET FILED ***

samples from an adequate number of significant zones of saturation, in accordance with paragraphs (B)(1)(a) and (B)(1)(b) of this rule, to ensure detection of any contaminant release from the facility.

(3) All monitoring wells, included in the ground water monitoring program shall be designed, installed, and developed in a manner that allows the collection of ground water samples that are representative of ground water quality in the geologic unit being monitored, and in accordance with the following criteria:

(a) Monitoring wells shall be cased in a manner that maintains the integrity of the monitoring well boreholes.

(b) The annular space (i.e., the space between the borehole and the well casing) above the sampling depth shall be sealed to prevent the contamination of the samples and the ground water.

(c) The casing shall be screened or perforated and surrounded by sand or gravel in such a way that allows for the following:

(i) For the minimization of the passage of formation materials into the well.

(ii) For the monitoring of discrete portions of the uppermost aquifer system or any significant zones of saturation above the uppermost aquifer system.

(d) The design, installation, development, maintenance procedures, and abandonment of any monitoring wells, piezometers, and other measurement, sampling, and analytical devices shall be documented in the ground water monitoring program plan.

(e) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices shall be operated and maintained to perform to design specifications throughout the life of the ground water monitoring program.

(f) Monitoring wells constructed or used for the purposes of this rule are not required to comply with Chapter 3745-9 of the Administrative Code.

(4) The number, spacing, and depth of ground water monitoring wells, included in the ground-water monitoring system shall be as follows:

*** DRAFT - NOT YET FILED ***

(a) Based on site-specific hydrogeologic information.

(b) Capable of detecting a release from the landfill facility to the ground water at the closest practicable location to the limits of solid waste placement.

(5) Unless the ground water is monitored to satisfy the requirements of paragraphs (E) and (F) of this rule, the owner or operator shall, at least annually, evaluate the ground water surface elevation data obtained in accordance with paragraph (C)(2) of this rule to determine whether the requirements of paragraph (B) of this rule for locating the monitoring wells continue to be satisfied. The results of this evaluation shall be included in the report required in accordance with rule 3745-30-14 of the Administrative Code. If the evaluation shows that paragraph (B) of this rule is no longer satisfied, the owner or operator shall immediately modify the number, location, and/or depth of the monitoring wells to bring the ground-water monitoring system into compliance with this requirement.

(C) Sampling, analysis, and statistical methods.

(1) The ground water monitoring program shall include consistent sampling and analysis procedures that are protective of human health and safety and the environment and that are designed to ensure monitoring results that provide an accurate representation of ground water quality at the background and downgradient wells installed in accordance with paragraph (B) of this rule. Sampling and analysis procedures employed in the ground water monitoring program shall be documented in a sampling and analysis plan which shall be included in the ground water monitoring program plan required by paragraph (A) of this rule, and which shall also be available for inspection at the landfill facility. The owner or operator shall use the methods documented in the sampling and analysis plan. Changes to the plan shall be submitted to Ohio EPA sixty days before implementation. This plan shall, at a minimum, include a detailed description of the equipment, procedures, and techniques to be used for the following:

(a) Measurement of ground water elevations.

(b) Collection of ground water samples, including the following:

(i) Well evacuation.

(ii) Sample withdrawal.

*** DRAFT - NOT YET FILED ***

(iii) Sample containers and handling.

(iv) Sample preservation.

(c) Performance of field analysis, including the following:

(i) Procedures and forms for recording raw data and the exact location, time, and facility-specific conditions associated with the data acquisition.

(ii) Calibration of field devices.

(d) Decontamination of equipment.

(e) Analysis of ground water samples.

(f) Chain of custody control, including the following:

(i) Standardized field tracking reporting forms to record sample custody in the field prior to and during shipment.

(ii) Sample labels containing all information necessary for effective sample tracking.

(g) Field and laboratory quality assurance and quality control, including the following:

(i) Collection of replicate samples.

(ii) Submission of field-bias blanks.

(iii) Potential interferences.

(2) Ground water elevations shall be measured within a single twenty-four-hour period in all monitoring wells at least semi-annually and in each well prior to purging and sampling. The owner or operator shall determine, for the uppermost aquifer system and for all significant zones of saturation monitored, the direction of ground-water flow at least semi-annually. The ground water elevations and direction(s) of flow shall be shown on a

*** DRAFT - NOT YET FILED ***

potentiometric map(s) submitted with the sampling data.

(3) The owner or operator shall establish background ground water quality, unless the exception in paragraph (C)(4) of this rule applies, by analyzing ground water samples collected from hydraulically upgradient well(s) for each of the monitoring parameters or constituents required in the particular ground water monitoring program that applies to the landfill facility as determined by paragraph (D), (E), or (F) of this rule.

(4) Background ground water quality at existing landfill facilities may be based on sampling of wells that are not hydraulically upgradient where the following occur:

(a) Hydrogeologic conditions do not allow the owner or operator to determine which wells are upgradient.

(b) Sampling of other wells will provide an indication of background ground water quality that is as representative or more representative than that provided by upgradient wells.

(5) The owner or operator shall, within ninety days of obtaining the final sample which completes the initial year of ground water monitoring, specify one of the following statistical methods to be used in evaluating ground water monitoring data. The statistical method chosen shall be conducted separately for each of the parameters required to be statistically evaluated in paragraph (D)(4) of this rule. The statistical method specified shall ensure protection of human health and safety and the environment and shall comply with the performance standards outlined in paragraph (C)(6) of this rule. The statistical method specified shall be selected from the following:

(a) A tolerance or prediction interval procedure in which an interval for each parameter is established from the distribution of the background data, and the level of each parameter in each monitoring well is compared to the upper tolerance or prediction limit.

(b) A control chart approach that gives control limits for each parameter.

(c) A parametric analysis of variance ("ANOVA") followed by multiple comparisons procedures to identify statistically significant evidence of contamination. This shall include estimation and testing of the contrasts between each monitoring well's mean and the background mean levels for each parameter.

*** DRAFT - NOT YET FILED ***

(d) An analysis of variance (ANOVA) based on ranks followed by multiple comparisons procedures to identify statistically significant evidence of contamination. This shall include estimation and testing of the contrasts between each monitoring well's median and the background medial levels for each parameter.

(e) Another statistical test method submitted by the owner or operator and approved by the director or his authorized representative.

(6) Any statistical method chosen in accordance with paragraph (C)(5) of this rule shall comply with the following performance standards as appropriate:

(a) The statistical method used to evaluate ground water monitoring data shall be appropriate for the distribution of chemical parameters or waste-derived constituents. If the distribution of the chemical parameters or waste-derived constituents is shown by the owner or operator to be inappropriate for a normal theory test, then the data should be transformed or a distribution free theory test should be used. If the distributions for the constituents differ, more than one statistical method may be needed.

(b) If an individual well comparison procedure is used to compare an individual monitoring well constituent concentration with background constituent concentrations or a ground water concentration level, the test shall be conducted at a type I error level not less than 0.01 for each testing period. If multiple comparisons procedures are used, the type I experimentwise error rate for each testing period shall be not less than 0.05; however, the type I error rate of not less than 0.01 for individual monitoring well comparisons shall be maintained. This performance standard does not apply for tolerance intervals, prediction intervals, or control charts.

(c) If a control chart approach is used to evaluate ground water monitoring data, the specific type of control chart and its associated parameter values shall be protective of human health and safety and the environment. The parameter values shall be determined after considering the number of samples in the background database, the data distribution, and the range of the concentration values for each parameter.

(d) If a tolerance interval or a prediction interval is used to evaluate ground water monitoring data, then the levels of confidence and the percentage

*** DRAFT - NOT YET FILED ***

of the population contained in any tolerance or prediction interval shall be protective of human health and safety and the environment. These statistical parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

(e) The statistical method shall account for data below the limit of detection with one or more statistical procedures that ensure protection of human health and safety and the environment. Any practical quantitation limit (PQL) used in the statistical method shall be the lowest concentration level that can be reliably achieved within the specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility.

(f) If necessary, the statistical method shall include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

(g) Background data can be added only in blocks of data resulting from the analysis of four or more statistically independent samples after the data have been statistically compared to the current background data and no statistical differences are detected, unless another method is deemed acceptable to the director.

(h) Prior to initially using an intra-well statistical method for the detection monitoring program, the owner or operator shall demonstrate the ground water is not impacted by a release from the landfill facility within the relevant well(s), unless approved otherwise by Ohio EPA.

(7) The owner or operator shall determine whether or not there is a statistically significant increase (or change in the case of pH) from background values for each parameter or constituent required by paragraph (D), (E), or (F) of this rule, as applicable. The owner or operator shall make this statistical determination either semi-annually, if paragraph (D) of this rule applies, or as specified in the ground water quality assessment plan required by paragraph (E) of this rule if that paragraph applies, or as specified by the director in the corrective measure selected in accordance with paragraph (F) of this rule if that paragraph applies. To determine whether a statistically significant increase or decrease has occurred, the owner or operator shall compare the ground water quality of each parameter or constituent at each downgradient ground water monitoring well to the background value of that parameter or constituent according to the statistical procedures specified in paragraphs (C)(5) and (C)(6) of this rule.

*** DRAFT - NOT YET FILED ***

(8) All ground water analysis results, statistical analysis results, and ground-water elevation data generated in accordance with paragraphs (C), (D), (E), and (F) of this rule shall be submitted to Ohio EPA not later than seventy-five days after sampling the well. All ground water data and accompanying text shall be submitted on a form specified by the director.

(D) Detection monitoring.

(1) The owner or operator shall determine the concentration or value of the applicable parameters from the applicable list(s) in appendix III of this rule for the owner or operator's waste(s). The concentration or value shall be determined in accordance with paragraphs (D)(3) to (D)(6) of this rule.

(2) The owner or operator of a residual or industrial waste landfill may propose an alternate list of parameters to meet the requirements of paragraphs (D)(3) to (D)(6) of this rule. The list of alternate parameters shall be submitted by the owner or operator and approved by the director prior to use. The alternate parameter list shall be indicative of the waste stream(s) deposited at the landfill facility and shall be protective of human health and safety and the environment. In proposing the alternate parameter list, the owner or operator shall, at a minimum, specify the following:

(a) The parameters to be analyzed in the ground water samples during the initial year of ground water monitoring in accordance with paragraph (D)(3) of this rule.

(b) The parameters to be analyzed in the ground water samples at least semi-annually in accordance with paragraph (D)(4) of this rule.

(c) The parameters to be analyzed in the ground water samples at least annually after the initial year in accordance with paragraph (D)(5) of this rule.

(d) The parameters specified in paragraph (D)(2)(b) of this rule to have their analytical results statistically evaluated in accordance with paragraph (D)(4) of this rule.

(e) The chemical composition of the solid waste(s) which have been, and are to be, deposited at the landfill facility.

(f) The chemical composition of leachate, if available, from an existing

*** DRAFT - NOT YET FILED ***

landfill facility being used to dispose of a similar waste(s).

(g) Any other relevant information that the director deems necessary.

(3) During the initial year of ground water monitoring, which shall commence prior to waste placement for newly permitted landfill facilities, the initial background concentrations or values shall be established for the background water quality parameters specified either in appendix III of this rule for the owner or operator's waste(s) or in the alternate parameter list approved in accordance with paragraph (D)(2) of this rule. The sampling frequency shall be at least quarterly for the initial year of ground water monitoring. The number and kinds of samples collected to establish background water quality for those background water quality parameters which are also listed as indicator parameters for the owner or operator's waste(s) in appendix III of this rule, shall be consistent with the appropriate statistical procedures employed pursuant to paragraphs (C)(5) and (C)(6) of this rule. The sample size shall be as large as necessary to ensure with reasonable confidence that a contaminant release from the facility will be detected. The sampling frequency shall assure, to the greatest extent technically feasible, that an independent sample is obtained, by reference to the monitored zone of saturation, effective porosity, hydraulic conductivity, hydraulic gradient, and the fate and transport characteristics of the potential contaminants.

(4) After the initial year, all monitoring wells shall be sampled at least semi-annually and the samples analyzed for the indicator parameters specified either in appendix III of this rule for the owner or operator's waste(s) or in the alternate parameter list approved in accordance with paragraph (D)(2) of this rule. The owner or operator shall statistically analyze the results for these required indicator parameters in accordance with paragraph (C)(7) of this rule. The number and kinds of samples collected shall be consistent with the statistical method used to analyze the data and shall be as often as necessary to ensure, with reasonable confidence, that a contaminant release to the ground water from the facility will be detected.

(5) After the initial year, all monitoring wells shall be sampled at least annually and the samples analyzed for the water quality annual parameters specified either in appendix III of this rule for the owner or operator's waste(s) or in the alternate parameter list approved in accordance with paragraph (D)(2) of this rule.

(6) Ground water samples shall be field analyzed for temperature, specific conductance, and pH whenever a sample is withdrawn from a monitoring well.

*** DRAFT - NOT YET FILED ***

(7) An alternative frequency for ground water sampling and/or statistical analysis required by paragraph (D)(5) of this rule may be proposed, in writing, by the owner or operator during the active life (including final closure) of a landfill facility and the post-closure care period. The director or his authorized representative may approve a proposed alternative frequency provided that the alternative sampling frequency and/or analysis frequency is not more than annually. Upon approval by the director or his authorized representative, the owner or operator may use the alternative sampling/analysis frequency. The owner or operator shall, at a minimum, consider the following factors in proposing an alternative sampling and/or analysis frequency:

(a) Lithology of the aquifer system and all stratigraphic units above the uppermost aquifer system.

(b) Hydraulic conductivity of the uppermost aquifer system and all stratigraphic units above the uppermost aquifer system.

(c) Ground water flow rates for the uppermost aquifer system and all zones of saturation above the uppermost aquifer system.

(d) Minimum distance between the upgradient edge of the limits of waste placement of the landfill facility and the downgradient monitoring well system.

(e) Resource value of the uppermost aquifer system.

(8) If at any monitoring well, the owner or operator determines, for two consecutive semi-annual statistical determination periods, that there has been a statistically significant increase (or change in the case of pH) from background values for one or more of the applicable indicator parameters specified in appendix III of this rule according to the statistical method specified by the owner or operator pursuant to paragraphs (C)(5), (C)(6), and (D)(9) of this rule, the owner or operator shall notify Ohio environmental protection agency not later than fifteen days after receiving the second period's statistical or analytical results which indicate a statistically significant change. The notification must indicate which parameters have shown a statistically significant change from background levels.

(9) The owner or operator may demonstrate that a source other than the landfill facility is the cause of the contamination or that the statistically significant increase results from error in the sampling, analysis, or statistical evaluation, or from natural variation in ground water quality.

*** DRAFT - NOT YET FILED ***

(a) When resampling demonstrates the increase to be an error, the resampling results shall be submitted to Ohio EPA in accordance with paragraph (C)(8) of this rule. If the owner or operator demonstrates using a resampling method that the statistically significant increase over background was a false positive, then the owner or operator may return to detection monitoring. The owner or operator shall comply with paragraphs (D)(8) to (D)(12) of this rule until this demonstration is submitted.

(b) When the owner or operator demonstrates that the statistically significant increase to be an error in statistical procedure or from natural variation in ground water quality, a report documenting this demonstration shall be submitted as an addendum to the results and data required in paragraph (C)(8) of this rule for approval by the director or his authorized representative. The owner or operator shall comply with paragraphs (D)(8) to (D)(12) of this rule until the demonstration report is approved.

(10) The owner or operator shall, within fifteen days of notifying Ohio EPA in accordance with paragraph (D)(8) of this rule, sample the leachate and/or the affected well(s) and analyze for constituents as follows:

(a) For facilities with leachate collection systems completely or partially underlying the waste disposal area, comply with one of the following:

(i) For facilities not characterizing their leachate, class I residual waste facilities, and industrial solid waste facilities, the leachate collection system shall be sampled and analyzed for those parameters listed in appendix II of rule 3745-27-10 of the Administrative Code and then within seventy-five days of sampling the leachate collection system, the affected well(s) shall be sampled and analyzed for the waste-derived constituents detected in the sample(s) from the leachate collection system, unless otherwise approved by the director or his authorized representative.

(ii) For class II, III, and IV residual waste facilities with previously characterized leachate in accordance with paragraph (F) of rule 3745-30-03 of the Administrative Code, rule 3745-30-04 of the Administrative Code, or rule 3745-30-14 of the Administrative Code, the affected well(s) shall be sampled and analyzed for all waste-derived constituents that have been detected and reported in the leachate.

*** DRAFT - NOT YET FILED ***

(b) For facilities without leachate collection systems comply with one of the following:

(i) For facilities not characterizing their leachate, class I residual waste facilities, and industrial solid waste facilities, the affected well(s) shall be sampled and analyzed for those parameters listed in appendix II of rule 3745-27-10 of the Administrative Code, unless otherwise approved by the director or his authorized representative.

(ii) For class II, III, and IV residual waste facilities, the affected well(s) shall be sampled and analyzed for those parameters listed in appendix II of this rule, unless otherwise approved by the director or his authorized representative.

(11) The owner or operator shall, within ninety days of sampling the affected well(s) in accordance with paragraph (D)(10) of this rule, sample all background wells for all waste-derived constituents detected in the samples from the affected well(s).

(12) The owner or operator shall, within ninety days of sampling the background wells as required by paragraph (D)(11) of this rule, sample all monitoring wells not sampled in accordance with the provisions of paragraphs (D)(10) and (D)(11) of this rule and those samples shall be analyzed for those waste-derived constituents found to be above background levels in the affected monitoring wells sampled in accordance with paragraph (D)(10) of this rule.

(13) If the owner or operator determines, based on the results of the sampling required by paragraph (D)(10), (D)(11), or (D)(12) of this rule, that there has not been an increase above background levels of waste-derived constituents at any monitoring well downgradient of the facility, then the owner or operator shall request that the director approve reinstatement of the detection monitoring program described in paragraphs (C) and (D)(1) to (D)(8) of this rule. Until the director or his authorized representative approves reinstatement of the detection monitoring program, the owner or operator shall continue to comply with paragraphs (D)(10) to (D)(12) and (E) of this rule.

(14) The director may consider the following information submitted by the owner or operator when evaluating a request made under paragraphs (D)(13), (E)(5), and (E)(7) of this rule:

*** DRAFT - NOT YET FILED ***

(a) The type of constituents and concentrations found in ground water monitoring wells at the facility;

(b) The ground water use and quality in the vicinity of the facility; and

(c) Potential threats to human health or safety and the environment.

(E) Assessment

(1) The owner or operator shall, within one hundred eighty days of conducting the sampling required under paragraph (D)(12) of this rule, submit to Ohio EPA and implement a specific plan for a ground water quality assessment program to determine the concentration and the rate and extent of migration of waste-derived constituents in the ground water at the landfill facility. This plan shall, at a minimum, include:

(a) A summary of the hydrogeologic conditions at the landfill facility; and

(b) A description of the detection monitoring program implemented by the landfill facility, including:

(i) The number, location, depth, and construction of detection monitoring wells with documentation; and

(ii) A summary of detection monitoring ground water analytical data; and

(iii) A summary of statistical analyses applied to the data; and

(c) A detailed description of the investigatory approach to be followed during the assessment, including but not limited to:

(i) The proposed number, location, depth, installation method, and construction of assessment monitoring wells; and

(ii) The proposed method(s) for gathering additional hydrogeologic information; and

(iii) The planned use of supporting methodology (i.e., soil gas or geophysical survey(s)); and

*** DRAFT - NOT YET FILED ***

(d) A detailed description of the techniques, procedures, and analytical equipment to be used for ground water sampling during the assessment, including but not limited to, the items listed in paragraphs (C)(1)(a) to (C)(1)(g) of this rule.

(e) A detailed description of the data evaluation procedures to be used, including but not limited to:

(i) Planned use of statistical data evaluation; and

(ii) Planned use of computer models; and

(iii) Planned use of previously gathered information; and

(iv) Criteria which will be utilized to determine if additional assessment activities are warranted; and

(f) A schedule of implementation.

(2) The owner or operator shall implement the ground water quality assessment plan which satisfies the requirements of paragraph (E)(1) of this rule to determine The concentrations and the rate and extent of migration of the waste-derived constituents in the ground water. The owner or operator shall make this determination within the time frame specified in the submitted ground water quality assessment plan. The owner or operator shall submit to Ohio EPA, not later than fifteen days after making this determination, a written report containing an assessment of the ground water quality including all data generated as part of implementation of the ground water quality assessment plan.

(3) All monitoring wells not affected by the ground water quality assessment program required by paragraph (E) of this rule shall be monitored in accordance with paragraphs (C) and (D) of this rule.

(4) The owner or operator shall Analyze on a semiannual basis the applicable indicator parameters in appendix III of this rule and those constituents determined to be released and on an annual basis all the parameters applicable for the facility in appendix III until relieved by the director in accordance with paragraph (D)(9), (E)(5), or (F)(16) of this rule.

(5) If the owner or operator determines, based on the results of the determination

*** DRAFT - NOT YET FILED ***

made according to paragraph (E)(2) of this rule, that no waste-derived constituents from the facility have entered the ground water, then the owner or operator shall request that the director approve reinstatement of the detection monitoring program described in paragraphs (C) and (D) of this rule. Until the director approves reinstatement of the detection monitoring program, the owner or operator shall comply with paragraphs (E)(6) and (F) of this rule.

(6) If the owner or operator determines, based on the determination made according to paragraph (E)(2) of this rule, that waste-derived constituents from the facility have entered the ground water, then the owner or operator shall continue to make the determination required in accordance with paragraph (E)(2) of this rule on a semiannual basis until released from this obligation by the director or unless an alternate time interval is established by the director.

(7) If the owner or operator determines, based on the determination made according to paragraph (E)(2) of this rule, that waste-derived constituents from the facility have entered the ground water, then the owner or operator may, prior to meeting the requirements of paragraph (F) of this rule, request that the director approve a compliance monitoring program at the facility. Any request made under this paragraph shall include a description of the compliance monitoring program including the following:

(a) The monitoring wells to be included in the compliance monitoring program.

(b) The constituents for which ground water samples will be analyzed and the proposed concentration level for each constituent, which shall act as a ground water trigger level. The ground water trigger levels shall be established using the criteria described in paragraph (F)(5) of this rule.

(c) The sampling, at least annually, of all compliance monitoring wells and background wells for all waste-derived constituents.

(d) The techniques, procedures, and analytical equipment to be used for ground water sampling including, but not limited to, the items listed in paragraphs (C)(1)(a) to (C)(1)(g) of this rule.

(e) The sampling of all compliance wells specified under paragraph (E)(7)(a) of this rule at least semi-annually and the analysis of those samples for those constituents specified under paragraph (E)(7)(b) of this rule. The frequency of sampling shall be consistent with the statistical method

*** DRAFT - NOT YET FILED ***

used to analyze the data and shall be determined based on the criteria listed in paragraph (D)(4) of this rule.

(f) A description of the statistical method to be used in evaluating the ground water analytical data generated under paragraph (E)(7)(e) of this rule. The statistical method shall be selected from those statistical methods contained in paragraph (C)(5) of this rule and shall meet all criteria listed in paragraphs (C)(5) and (C)(6) of this rule.

(g) Provisions for determining, at least semi-annually, if there has been a statistically significant increase above the trigger levels for those constituents specified under paragraph (E)(7)(b) of this rule. This determination shall be consistent with the criteria stated in paragraph (C)(7) of this rule.

(h) Provisions for controlling the source(s) of releases in order to reduce or eliminate, to the extent practicable, further releases of waste-derived constituents into the environment.

(i) Provisions for submitting a corrective measures plan in accordance with paragraph (F) of this rule if a statistically significant increase above the trigger levels for those constituents specified under paragraph (E)(7)(b) of this rule is detected and confirmed.

(F) Corrective measures.

(1) Unless excused in accordance with paragraph (E)(5) or (E)(7) of this rule, the owner or operator shall submit a corrective measures study to the director not later than one hundred eighty days after making the determination in accordance with paragraph (E)(2) of this rule, or not later than one hundred eighty days after submitting a request in accordance with paragraph (E)(7) of this rule. This study shall evaluate all practicable remediation procedures which are available for remediating any contamination discovered during the ground water quality assessment. The evaluated remediation procedures shall, at a minimum do the following:

(a) Be protective of human health and safety and the environment.

(b) Attain the proposed ground water concentration levels specified in accordance with paragraph (F) of this rule.

*** DRAFT - NOT YET FILED ***

(c) Control the source(s) of releases to reduce or eliminate, to the extent practicable, further releases of waste-derived constituents into the environment.

(d) Comply with standards for management of wastes as specified in paragraph (F)(13) of this rule.

(2) The owner or operator shall evaluate each proposed remediation procedure within the corrective measures study. This evaluation shall, at a minimum, consider the following:

(a) Any potential remediation procedure, which shall be assessed for the long-term and short-term effectiveness and the protection it affords. This shall include the degree of certainty that the remediation procedure will prove successful. Factors to be considered include the following:

(i) Magnitude of reduction of existing risks.

(ii) Magnitude of residual risks in terms of likelihood of further releases due to waste remaining following implementation of a remediation procedure.

(iii) The type and degree of long-term management required, including monitoring, operation, and maintenance.

(iv) Short-term risks that may affect the community, workers, or the environment during implementation of such a remediation procedure, including potential threats to human health and safety and the environment associated with excavation, transportation, redisposal, or containment.

(v) Potential for human and environmental receptor exposure to remaining wastes, considering the potential threat to human health and safety and the environment associated with excavation, transportation, redisposal, or containment.

(vi) Long-term reliability of the engineering and institutional controls.

(vii) Potential need for replacement of the remediation procedure.

*** DRAFT - NOT YET FILED ***

(b) The effectiveness of the remediation procedure in controlling the source in order to reduce further releases, including the following:

(i) The extent to which containment practices will reduce further releases.

(ii) The extent to which treatment technologies may be used.

(c) The need to coordinate with, and obtain necessary approvals and permits from, other agencies.

(d) The available capacity and location of needed treatment, storage, and disposal services.

(e) The performance, reliability, ease of implementation, and potential impacts of the potential remediation procedures, including safety impacts, cross-media impacts, and control of exposure to any residual contamination.

(f) A schedule for initiating and completing each remediation procedure discussed in the study. In establishing this schedule, the owner or operator shall consider the following:

(i) The extent and nature of any contamination.

(ii) The practical capability of remedial technologies to achieve compliance with ground water concentration levels established in accordance with paragraph (F)(6) of this rule and other objectives of the remediation procedure.

(iii) The availability of treatment or disposal capacity for wastes managed during implementation of the remediation procedure.

(iv) The desirability of utilizing technologies that are not currently available, but which may offer significant advantages over currently available technologies in terms of protection, reliability, safety, or the ability to achieve remedial objectives.

(v) Potential risks to human health and safety and the environment from contaminant exposure prior to completion of the remediation

*** DRAFT - NOT YET FILED ***

procedure.

(vi) Practicable capability of the owner or operator.

(vii) Other relevant factors.

(g) Resource value of the aquifer system, including the following:

(i) Current and future uses.

(ii) Proximity and withdrawal rate of users.

(iii) Ground water quantity and quality.

(iv) The potential damage to wildlife, crops, vegetation, and physical structures resulting from exposure to waste constituents.

(v) The hydrogeologic characteristics of the facility and surrounding area.

(vi) Ground water removal and treatment costs.

(vii) The cost and availability of alternate water supplies.

(3) Unless excused in accordance with paragraph (E)(5) or (E)(7) of this rule, the owner or operator shall make public notice of the existence of the assessment report and the corrective measures study and place those documents in the public library closest to the facility for public inspection not later than one hundred eighty days after making a first determination in accordance with paragraph (E)(2) of this rule.

(4) The director or his authorized representative may require the owner or operator to evaluate, as part of the corrective measures study, one or more specific potential remediation procedure(s).

(5) If, at any time during the assessment described in paragraphs (E) and (F) of this rule, the director determines that the facility threatens human health or safety or the environment, the director may require the owner or operator to implement the following measures:

*** DRAFT - NOT YET FILED ***

(a) Notify all persons, via certified mail or any other form of mail accompanied by a receipt, who own the land or reside on the land that directly overlies or lies adjacent to any part of the plume of contamination.

(b) Take any interim measures deemed necessary by the director to ensure the protection of human health and safety and the environment. Interim measures should, to the extent practicable, be consistent with the objectives of and contribute to the performance of any remediation procedure that may be required pursuant to paragraphs (F)(1), (F)(2), and (F)(6) of this rule. The following factors may be considered by the director in determining whether interim measures are necessary:

(i) The amount of time required to develop and implement a final remediation procedure.

(ii) Actual or potential exposure of nearby populations or environmental receptors to waste-derived constituents.

(iii) Any further degradation of the ground water that may occur if remedial action is not initiated expeditiously.

(iv) Weather conditions that may cause waste-derived constituents to migrate or be released.

(v) Risks of fire, explosion, or potential for exposure to waste-derived constituents as a result of an accident or failure of a container or handling system.

(vi) Other situations that threaten human health and safety and the environment.

(6) The corrective measures study shall propose a concentration level for each waste-derived constituent which has been detected in the ground water at levels above background levels. These shall be established as follows:

(a) The proposed concentration levels in the ground water shall be protective of human health and safety and the environment.

(b) Unless an alternate level is deemed necessary to protect environmental receptors, then the following apply:

*** DRAFT - NOT YET FILED ***

(i) For known or suspected carcinogens, the proposed concentration levels shall be established at concentration levels below those that represent a cumulative excess upper-bound lifetime risk to an individual within the 1×10^{4} to 1×10^{-6} range.

(ii) For noncarcinogens, the proposed concentration levels shall be reduced to levels to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effects during a lifetime.

(c) In establishing the proposed concentration levels that meet the requirements of paragraph (F)(6)(b) of this rule, the owner or operator shall consider the following:

(i) Multiple contaminants in the ground water.

(ii) Exposure threat to sensitive environmental receptors.

(iii) Other site-specific exposure or potential exposure to ground water.

(iv) The reliability, effectiveness, practicability, and other relevant factors of the remediation procedure.

(d) For ground water that is a current or potential source of drinking water, the owner or operator shall evaluate and justify any concentration level that is higher than a federal safe drinking water act maximum contaminant level or a secondary drinking water standard.

(e) The proposed concentration levels shall not be set below background levels unless the director determines the following:

(i) Cleanup to levels below background levels is necessary to protect human health and safety and the environment.

(ii) Such cleanup is in connection with an area-wide remedial action under other authorities.

(7) The director shall select from the corrective measures report, or designate according to paragraph (F)(4) of this rule, the remediation procedure which best meets the criteria listed in paragraphs (F)(1), (F)(2) and (F)(6) of this

*** DRAFT - NOT YET FILED ***

rule. The owner or operator shall implement the remediation procedure designated by the director in accordance with the schedule of implementation selected by the director.

(8) In implementing the remediation procedure approved by the director in accordance with paragraph (F)(7) of this rule, the owner or operator shall achieve the designated concentration levels, as determined by paragraph (F)(6) of this rule, at all points within the plume of contamination that lie beyond the limits or solid waste placement.

(9) Upon completion of the remediation procedure, when the ground water quality meets the designated concentration levels as specified in paragraphs (F)(6) and (F)(8) of this rule, the owner or operator shall demonstrate on a semiannual basis for a period of five years or until the landfill facility's post-closure care period ends, whichever is longer, that the designated concentration levels have not been exceeded as provided in paragraph (F)(8) of this rule before being released from compliance with the ground water monitoring requirements.

(10) If the concentrations of the constituents monitored in accordance with paragraph (F)(9) of this rule exceed the concentration levels determined in accordance with paragraph (F)(6) of this rule, the owner or operator shall reimplement the designated remediation procedure or submit new remediation procedures in accordance with the criteria in paragraphs (F)(1) and (F)(2) of this rule.

(11) The director may determine, based on information developed by the owner or operator after implementation of the remediation procedure has begun, or from other information, that compliance with the requirements(s) for the remediation procedure selected under paragraphs (F)(1) and (F)(2) of this rule is not technically practicable. In making such a determination, the director shall consider the following:

(a) The owner or operator's efforts to achieve compliance with the requirement(s).

(b) Whether other currently available or new methods or techniques could practicably achieve compliance with the requirements.

(12) If the director determines that compliance with a remediation procedure requirement is not technically practicable, then the director may require that the owner or operator do the following:

*** DRAFT - NOT YET FILED ***

(a) Implement alternate measures to control human or environmental receptor exposure to residual contamination, as necessary, to protect human health and safety and the environment.

(b) Implement alternate measures for control of the sources of contamination, or for removal or decontamination of equipment, units, devices, or structures required to implement the remediation procedure(s), that are both of the following:

(i) Technically practicable.

(ii) Consistent with the overall objective of the remediation procedure.

(13) All solid wastes that are managed pursuant to a remediation procedure required under paragraph (F)(8) of this rule, or an interim measure required under paragraph (F)(5) of this rule, shall be managed in the following manner:

(a) That is protective of human health and safety and the environment.

(b) That complies with applicable laws and regulations.

(14) Remediation procedures selected pursuant to paragraphs (F)(1) and (F)(2) of this rule shall be considered complete when compliance with the ground-water concentration levels established under paragraph (F)(6) of this rule have been achieved, and all actions required to complete the remediation procedure have been satisfied.

(15) Upon completion of the remediation procedure, the owner or operator shall submit to the director certification that the remediation procedure has been completed. The certification must be signed by the owner or operator and by an independent professional(s) skilled in the appropriate technical discipline(s).

(16) When, upon receipt of the certification and in consideration of any other relevant information, the director determines that the remediation procedure has been completed in accordance with paragraph (F)(14) of this rule, the director shall release the owner or operator from continuing performance of the approved remediation procedure. This approval shall not exempt the owner or operator from meeting the requirements of paragraphs (F)(9) and (F)(10) of this rule.

*** DRAFT - NOT YET FILED ***

(17) The owner or operator shall submit, upon implementation of the remediation procedure chosen under paragraph (F)(7) of this rule, a report of the activities being conducted at the facility as part of implementation of the chosen remediation procedure. This report shall be submitted semiannually and contain the following:

(a) A narrative description of all remedial activities that have occurred since the previous report.

(b) All data generated as part of the remedial activities at the facility.

Appendix I

Parameter	CAS Registry Number
1) Acetone.	67-64-1
2) Acrylonitrile.	107-13-1
3) Benzene.	71-43-2
4) Bromocholoromethane.	74-97-5
5) Bromodicholoromethane.	75-27-4
6) Bromoform; Tribromomethane	75-25-2
7) Carbon disulfide	75-15-0
8) Carbon tetrachloride	56-23-5
9) Chlorobenzene.	108-90-7
10) Chloroethane; Ethyl chloride.	75-00-3
11) Chloroform; Trichloromethane	67-66-3
12) Dibromochloromethane; Chlorodibromomethane	124-48-1
13) 1,2-Dibromo-3-chloropropane; DBCP.	96-12-8
14) 1,2-Dibromomethane; Ethylene dibromide; EDB.	106-93-4
15) o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
16) p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
17) trans-1,4-Dichloro-2-butene.	110-57-6
18) 1,1-Dichloroethane; Ethylidene chloride.	75-34-3
19) 1,2-Dichloroethane; Ethylidene dichloride.	107-06-2
20) 1,1-Dichloroethylene; 1,1-Dichloroethene; Vinylidene chloride	75-35-4
21) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
22) trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene.	156-60-5
23) 1,2-Dichloropropane; Propylene dichloride.	78-87-5
24) cis-1,3-Dichloropropene.	10061-01-5
25) trans-1,3-Dichloropropene.	10061-02-6
26) Ethylbenzene	100-41-4
27) 2-Hexanone; Methyl butyl ketone.	591-78-6
28) Methyl bromide; Bromomethane	74-83-9
29) Methyl chloride; Chloromethane	74-87-3
30) Methylene bromide; Dibromomethane.	74-95-3
31) Methylene chloride; Dichloromethane.	75-09-2
32) Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
33) Methyl iodide; iodomethane	74-88-4
34) 4-Methyl-2-pentanone; Methyl isobutyl ketone	108-10-1
35) Styrene.	100-42-5
36) 1,1,1,2-Tetrachloroethane.	630-20-6
37) 1,1,2,2-Tetrachloroethane.	79-34-5

38) Tetrachloroethylene; Tetrachloroethene; Perchloroethylene	127-18-4
39) Toluene.	108-88-3
40) 1,1,1-Trichloroethane; Methylchloroform.	71-55-8
41) 1,1,2-Trichloroethane.	79-00-5
42) Trichloroethylene; Trichloroethene	79-01-6
43) Trichloroflouromethane; CFC-11	75-69-4
44) 1,2,3-Trichloropropane	96-18-4
45) Vinyl acetate.	108-05-4
46) Vinyl chloride	75-01-4
47) Xylene (total).	includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

Appendix II

	Compound	CAS RN2
1)	Acenaphthene; 1,2-Dihydroacenaphthylene	83-32-9
2)	Acenaphthylene	208-96-8
3)	Acetone;2-Propanone	67-64-1
4)	Acetonitrile; Methyl cyanide	75-05-8
5)	Acetophenone; 1-Phenylethanone	98-86-2
6)	2-Acetylaminoflourene; 2-AAF; N-9H-flouren-2-yl-acetamide	53-96-3
7)	Acrolein; 2-Propenal	107-02-8
8)	Acrylonitrile; 2-Propenenitrile	107-13-1
9)	Aldrin; 1,2,3,4,10,10-hexachlora-1,4,4a,5,8,8a-hexahydro(1a,4a,4ab,5a,8a,8ab)-1,4:5,8-Dimethanonaphthalene.	309-00-23
10)	Allyl chloride; 3-Chloro-1-propene	107-05-1
11)	4-Aminobiphenyl; [1,1'-Biphenyl]-4-amine	92-67-1
12)	Anthracene	120-12-7
13)	Antimony	See note 4
14)	Arsenic	See note 4
15)	Barium	See note 4
16)	Benzene	71-43-2
17)	Benzo[a]anthracene; Benzanthracene	56-55-3
18)	Benzo[b]flouranthene; Benz[e]acephenanthylene	205-99-2
19)	Benzo[k]flouranthene	207-08-9
20)	Benzo[ghi]perylene	191-24-2
21)	Benzo[a]pyrene	50-32-8
22)	Benzyl alcohol; Benzenemethanol	100-51-6
23)	Beryllium	See note 4
24)	alpha-BHC; 1,2,3,4,5,6-Hexachlorocyclohexane, (1a,2a,3b,4a,5b,6b)	319-84-63
25)	beta-BHC; 1,2,3,4,5,6-Hexachlorocyclohexane, (1a,2b,3a,4b,5a,6b)	319-85-73
26)	delta-BHC; 1,2,3,4,5,6-Hexachlorocyclohexane, (1a,2a,3a,4b,5a,6b).	319-86-83
27)	gamma-BHC; Lindane; 1,2,3,4,5,6-Hexachlorocyclo hexane,(1a,2a,3b,4a,5a,6b).	58-89-93
28)	bis(2-Chloroethoxy)methane; 1,1'-[methylenebis(oxy)] bis[2-chloroethane]	111-91-1
29)	bis(2-Chloroethyl) ether; Dichloroethyl ether; 1,1'-oxybis[2-Chloroethane]	111-44-4
30)	bis-(2-Chloro-1-methylethyl) Ether; 2,2'-Dichloro-diisopropyl ether; DCIP; 2,2'-oxybis[1-Chloropropane]	108-60-15
31)	bis(2-Ethylhexyl) Phthalate; 1,2-Benzenedicarboxylic acid, bis(2-Ethylhexyl) ester.	117-81-7
32)	Bromochloromethane; Chlorobromomethane	74-97-5
33)	Bromodichloromethane; Dibromochloromethane	75-27-4
34)	Bromoform; Tribromomethane	75-25-2
35)	4-Bromophenyl phenyl ether; 1-Bromo-4-phenoxy-benzene	101-55-3
36)	Butyl benzyl phthalate; Benzyl butyl phthalate; 1,2-Benzenedicarboxylic acid, Butyl phenylmethyl ester	85-68-7
37)	Cadmium	See note 4

38) Carbon disulfide 75-15-0
39) Carbon tetrachloride; Tetrachloromethane 56-23-5
40) Chlordane; 1,2,4,5,6,8,8-octochloro-2,3,3a,4,7,7a-
hexahydro-4,7-methano-1H-indene. . . . . See note 6
41) p-Chloroaniline; 4-Chlorobenzenamine 106-47-8
42) Chlorobenzene 108-90-7
43) Chlorobenzilate; 4-Chloro-a-(4-Chlorophenyl)-a-
Hydroxybenzeneacetic acid, Ethyl ester 510-15-6
44) p-Chloro-m-Cresol; 4-Chloro-3-Methylphenol 59-50-7
45) Chloroethane; Ethyl chloride 75-00-3
46) Chloroform; Trichloromethane 67-66-3
47) 2-Chloronaphthalene 91-58-7
48) 2-Chlorophenol 95-57-8
49) 4-Chlorophenyl phenyl ether; 1-Chloro-4-phenoxy benzene...7005-72-3
50) Chloroprene; 2-Chloro-1,3-butadiene 126-99-8
51) Chromium ..... See note 4
52) Chrysene 218-01-9
53) Cobalt ..... See note 4
54) Copper ..... See note 4
55) m-Cresol; 3-Methylphenol 108-39-4
56) o-Cresol; 2-Methylphenol 95-48-7
57) p-Cresol; 4-Methylphenol 106-44-5
58) Cyanide 57-12-5
59) 2,4-D; 2,4-Dichlorophenoxyacetic acid 94-75-7
60) 4,4'-DDD; 1,1'-(2,2-Dichloroethylidene)bis
[4-chlorobenzene] 72-54-8
61) 4,4'-DDE; 1,1'-(2,2-Dichloroethyenylidene)bis
[4-chlorobenzene] 72-55-9
62) 4,4'-DDT; 1,1'-(2,2,2-Trichloroethylidene)bis
[4-chlorobenzene] 50-29-3
63) Diallate; bis(1-Methylethyl)-carbamothoic acid
S-(2,3-Dichloro-2-propenyl) ester 2303-16-4
64) Dibenz[a,h]anthracene 53-70-3
65) Dibenzofuran 132-64-9
66) Dibromocholormethane; Chlorodibromomethane 124-48-1
67) 1,2-Dibromo-3-chloropropane; DBCP 96-12-8
68) 1,2-Dibromoethane; Ethylene dribromide; EDB 106-93-4
69) Di-n-butyl phthalate; 1,2-Benzenedicarboxylic
acid dibutyl ester 84-74-2
70) o-Dichlorobenzene; 1,2-Dichlorobenzene 95-50-1
71) m-Dichlorobenzene; 1,3-Dichlorobenzene 541-73-1
72) p-Dichlorobenzene; 1,4-Dichlorobenzene 106-46-7
73) 3,3'-Dichlorobenzidine; 3,3'-Dichloro-[1,1'-bi
phenyl]-4,4'-diamine 91-94-1
74) trans-1,4-Dichloro-2-butene 110-57-6
75) Dichlorodifluoromethane; CFC 12 75-71-8
76) 1,1-Dichloroethane; Ethylidene chloride 75-34-3
77) 1,2-Dichloroethane; Ethylene dichloride 107-06-2
78) 1,1-Dichloroethylene; 1,1-Dichloroethene;
Vinylidene chloride 75-35-4
79) cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene 156-59-2
80) trans-1,2-Dichloroethylene; trans-1,2-Dichloro ethene 156-60-5

81) 2,4-Dichlorophenol 120-83-2
82) 2,6-Dichlorophenol 87-65-0
83) 1,2-Dichloropropane; Propylene dichloride 78-87-5
84) 1,3-Dichloropropane; Trimethylene dichloride 142-28-9
85) 2,2-Dichloropropane; Isopropylidene chloride 594-20-7
86) 1,1-Dichloropropene; 1,1-Dichloro-1-propene 563-58-6
87) cis-1,3-Dichloropropene; 10061-01-5
88) trans-1,3-Dichloropropene. 10061-02-6
89) Dieldrin; 3,4,5,6,9,9-Hexachloro-1a,2,2a,3,6,6a,
7,7a-octahydro-2,7:3,6-dimethanonaphthalene
[2,3-b]oxirene, (1aa,2b,2aa,3b,6b,6aa,7b,7aa). 60-57-13
90) Diethyl phthalate; 1,2-Benzenedicarboxylic
acid, Diethyl ester. 84-66-2
91) O,O-Diethyl O-2-Pyrazinyl phosphorothioate; Thionazin. . . 297-97-2
92) Dimethoate; Phosphorodithoic acid O,O-Dimethyl-S-
[2-(methylamino)-2-oxoethyl] ester 60-51-5
93) p-(Dimethylamino)azobenzene; N,N-Dimethyl-4-
(phenylazo)benzenamine 60-11-7
94) 7,12-Dimethylbenz[a]anthracene 57-97-6
95) 3,3'-Dimethylbenzidene; 3,3'-Dimethyl[1,1'bi
phenyl]-4,4'-diamine 119-93-7
96) 2,4-Dimethylphenol; m-Xylenol 105-67-9
97) Dimethyl phthalate; 1,2-Benzenedicarboxylic
acid, dimethyl ester 131-11-3
98) m-Dinitrobenzene 99-65-0
99) 4,6-Dinitro-o-cresol; 4,6-Dinitro-2-methylphenol;
2-Methyl-4,6-dinitrophenol 534-52-1
100) 2,4-Dinitrophenol. 51-28-5
101) 2,4-Dinitrotoluene; 1-Methyl-2,4-dinitrobenzene. 121-14-2
102) 2,6-Dinitrotoluene; 2-Methyl-1,3-dinitrobenzene. 606-20-2
103) Dinoseb; DMBP; 2-sec-Butyl-4,6-dinitrophenol;
2-(1-Methylpropyl)-4,5-dinitrophenol 88-85-7
104) Di-n-octyl phthalate; 1,2-Benzenedicarboxylic
acid, Dioctyl ester. 117-84-0
105) Diphenylamine; N-phenylbenzenamine 122-39-4
106) Disulfoton; Phosphorodithioic acid O,O-diethyl
S-[2-(ethylthio)ethyl] ester 298-04-4
107) Endosulfan I; 6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,
9a-hexahydro-6,9-methano-2,4,3-benzodioxa thiepin,
3-oxide 959-98-8
108) Endosulfan II; 6,7,8,9,10,10-Hexachloro-1,5,5a,6,9,
9a-hexahydro-6,9-methano-2,4,3-benzodioxa
thiepin, 3-oxide (3a,5aa,6b,9b,9aa). 33213-65-93
109) Endosulfan sulfate; 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,
9a-hexahydro-6,9-methano-2,4,3-benzodioxa
thiepin, 3-3-dioxide 1031-07-8
110) Endrin; 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-
octahydro-2,7:3,6-dimethanonaphth[2,3-
b]oxirene, (1aa,2b,2ab,3a,6a,6ab,7b,7aa) 72-20-83
111) Endrin aldehyde; 2,2a,3,3,4,7-hexachlorodecahydro-
1,2,4-methenocyclopenta[cd]pentalene-5-carboxaldehyde,
(1a,2b,2ab,4b,4ab,5b,6ab,6bb,7r*). 7421-93-43

112) Ethylbenzene 100-41-4
113) Ethyl methacrylate; 2-Methyl-2-propenoic acid, ehtyl ester 97-63-2
114) Ethyl methanesulfonate; Methanesulfonic acid, ethyl ester. 62-50-0

115) Famphur; Phosphorothioic acid, O-[4-[(dimethylamino) sulfonyl]phenyl]0,0-dimethyl ester 52-85-7
116) Flouranthene 206-44-0
117) Flourene; 9H-flourene 86-73-7
118) Heptachlor; 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methano-1H-indene 76-44-8
119) Heptachlor epoxide; 2,3,4,5,6,7,7-Heptachloro-1a,1b, 5,5a,6,6a-hexahydro-2,5-methano-2h-indeno [1,2-b]oxirene, (1aa,1bb,2a,5a,5ab,6b,6aa) 1024-57-33
120) Hexachorobenzene 118-74-1
121) Hexachlorobutadiene; 1,1,2,3,4,4-Hexachloro-1,3-butadiene. 87-68-3
122) Hexachlorocyclopentadiene; 1,2,3,4,5,5-Hexachloro-1,3-cyclopentadiene 77-47-4
123) Hexachloroethane 67-72-1
124) Hexachloropropene; 1,1,2,3,3,3-Hexachloro-1-propene. . . 1888-71-7
125) 2-Hexanone; Methyl butyl ketone 591-78-6
126) Indeno(1,2,3-cd)pyrene 193-39-5
127) Isobutyl alcohol;2-Methyl-1-propanol 78-83-1
128) Isodrin; 1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene, (1a,4a,4ab,5b,8b,8ab). 465-73-63
129) Isophorone; 3,5,5-Trimethyl-2-cyclohexen-1-one 78-59-1
130) Isosafrole; 5-(1-Propenyl)-1,3-benzodioxole 120-58-1
131) Kepone; 1,1a,3,3a,4,5,5a,5b,6-decachlorocta hydro-1,3,4-methano-2H-cyclobuta[cd9]pentalen-2-one. . . . 143-50-0
132) Lead . . . . . See note 4
133) Mercury . . . . . See note 4
134) Methacrylonitrile; 2-Methyl-2-propenenitrile 126-98-7
135) Methapyrilene; N,N-dimethyl-N'-2-pyridinyl-N'-(1/2-thienylmethyl)-1,2-ethanediamine. 91-80-5
136) Methoxychlor; 1,1'-(2,2,2-Trichloroethylidene)bis [4-Methoxybenzene] 72-43-5
137) Methyl bromide; Bromomethane 74-83-9
138) Methyl chloride; Chloromethane 74-87-3
139) 3-Methylcholanthrene; 1,2-Dihydro-3-methyl-benze[j]aceanthrylene. 56-49-5
140) Methyl ethyl ketone; MEK; 2-Butanone 78-93-3
141) Methyl iodide; Iodomethane 74-88-4
142) Methyl methacrylate; 2-Methyl-2-propenoic acid, methyl ester 80-62-6
143) Methyl methanesulfonate; Methanesulfonic acid, methyl ester. 66-27-3
144) 2-Methylnaphthalene 91-57-6
145) Methyl parathion; Parathion methyl; Phosphorothioic acid, 0,0-dimethyl 0-(4-nitrophenyl) ester 298-00-0
146) 4-Methyl-2-pentanone; Methyl isobutyl ketone 108-10-1

147) Methylene bromide; Dibromomethane 74-95-3
148) Methylene chloride; Dichloromethane 75-09-2
149) Naphthalene 91-20-3
150) 1,4-Naphthoquinone; 1,4-Naphthalenedione 130-15-4
151) 1-Naphthylamine; 1-Naphthalenamine 134-32-7
152) 2-Naphthylamine; 2-Naphthalenamine 91-59-8
153) Nickel . . . . . See note 4
154) o-Nitroaniline; 2-Nitroaniline; 2-Nitrobenzenamine 88-74-4
155) m-Nitroaniline; 3-Nitroaniline; 3-Nitrobenzenamine 99-09-2
156) p-Nitroaniline; 4-Nitroaniline; 4-Nitrobenzenamine . . . 100-01-6
157) Nitrobenzene 98-95-3
158) o-Nitrophenol; 2-Nitrophenol 88-75-5
159) p-Nitrophenol; 4-Nitrophenol 100-02-7
160) N-Nitrosodi-n-butylamine; N-Butyl-N-Nitroso-1-butanamine. .924-16-3
161) N-Nitrosodiethylamine; N-Ethyl-N-nitroso ethanamine 55-18-5
162) N-Nitrosodimethylamine; N-Methyl-N-nitroso methananmine . 62-75-9
163) N-Nitrosodiphenylamine; N-Nitroso-N-phenyl benzenamine..... 86-30-6
164) N-Nitrosodipropylamine; N-Nitroso-N-dipropylamine;
di-n-propylnitrosamine; N-Nitroso-N-propyl- 1-propanamine..621-64-7
165) N-Nitrosomethylethalamine; N-Methyl-N-nitroso
ethanamine. 10595-95-6
166) N-Nitrsopiperidine; 1-Nitrosopiperidine 100-75-4
167) N-Nitrosopyrrolidine; 1-Nitrosopyrrolidine 930-55-2
168) 5-Nitro-o-toluidine; 2-Methyl-5-nitrobenzenamine 99-55-8
169) Parathion; Phosphorothioic acid, O,O-diethyl O-
(4-nitrophenyl) ester 56-38-2
170) Pentachlorobenzene 608-93-5
171) Pentachloronitrobenzene 82-68-8
172) Pentachlorophenol 87-86-5
173) Phenacetin; N-(4-Ethoxyphenyl)acetamide 62-44-2
174) Phenanthrene 85-01-8
175) Phenol 108-95-2
176) p-Phenylenediamine; 1,4-Benzenediamine 106-50-3
177) Phorate; Phosphorodithioic acid, O,O-Diethyl S-
[(ethylthio]methyl] ester 298-02-2
178) Polychlorinated biphenyls; PCBs; aroclors;
1,1'-Biphenyl, chloro derivatives ..... See note 7
179) Pronamide; 3,5-Dichloro-N-(1,1-dimethyl-2-
propynyl)benzamide 23950-58-5
180) Propionitrile; Ethyl cyanide 107-12-0
181) Pyrene 129-00-0
182) Safrole; 5-(2-Propenyl)-1,3-benzodioxole 94-59-1
183) Selenium ..... See note 4
184) Silver ..... See note 4
185) Silvex; 2,4,5-TP; 2-(2,4,5-Trichlorophenoxy)propanoic
acid 93-72-1
186) Styrene; Ethenylbenzene 100-42-5
187) Sulfide 18496-25-8
188) 2,4,5-T; 2,4,5-Trichlorophenoxyacetic acid 93-76-5
189) 1,2,4,5-Tetrachlorobenzene 95-94-3
190) 1,1,1,2-Tetrachloroethane 630-20-6
191) 1,1,2,2-Tetrachloroethane 79-34-5

192) Tetrachloroethylene; Tetrachloroethene;
Perchloroethylene 127-18-4
193) 2,3,4,6-Tetrachlorophenol 58-90-2
194) Thallium ..... See note 4
195) Tin ..... See note 4
196) Toluene; Methylbenzene 108-88-3
197) o-Toluidine; 2-Methylbenzenamine 95-53-4
198) Toxaphene ..... See note 8
199) 1,2,4-Trichlorobenzene 120-82-1
200) 1,1,1-Trichloroethane; Methylchloroform 71-55-6
201) 1,1,2-Trichloroethane 79-00-5
202) Trichloroethylene; Trichloroethene 79-01-6
203) Trichlorofluoromethane; CFC-11 75-69-4
204) 2,4,5-Trichlorophenol 95-95-4
205) 2,4,6-Trichlorophenol 88-06-2
206) 1,2,3-Trichloropropane 96-18-4
207) o,o,o-Triethyl phosphorothioate; Phosphorothioic acid,
o,o,o-triethyl ester 126-68-1
208) sym-Trinitrobenzene; 1,3,5-Trinitrobenzene 99-35-4
209) Vanadium . . . . . See note 4
210) Vinyl acetate; Acetic acid, ethenyl ester 108-05-4
211) Vinyl chloride; Chloroethene 75-01-4
212) Xylene (total); Dimethylbenzene . . . . . See note 9
213) Zinc . . . . . See note 4

Note 1: Common names are those widely used in government regulation, scientific publications, and commerce; synonyms exist for many chemicals.

Note 2: Chemical Abstract Service registry number. Where "total" is entered, all species in ground water that contain this element are included.

Note 3: When numbers and letters appear in this form at the end of a chemical name, i.E. (1a,4a,4aB,5a,8a,8aB), the following applies: "a" = small case "a"; "a" (italic) = alpha; "b" = small case "b"; and "B" (italic) = beta.

Note 4: Analysis for these compounds shall be representative of the quality background ground water that has not been affected by past or present operations at the sanitary landfill facility and representative of the quality of ground water passing directly downgradient of the limits of solid waste placement.

Note 5: CAS No. 108-60-1. This substance is often called bis(2-Chloroisopropyl) ether, the name Chemical Abstracts Service applies to its commercial isomer, propane, 2,2"-oxybis[2-Chloro-(CAS RN 39638-32-9).

Note 6: Chlordane: This entry includes alpha-chlordane (CAS RN 5103-71-9), beta-Chlordane (CAS RN 5103-74-2), gamma-Chlordane (CAS RN 5566-34-7), and constituents of Chlordane (CAS RN 54-74-9 and CAS RN 12789-03-06).

Note 7: Polychlorinated biphenols (CAS RN 1336-36-3); This category contains congener chemicals, including constituents of Aroclor 1016 (CAS RN 12674-11-2), Aroclor 1221 (CAS RN 11104-28-2),

Aroclor 1232 (CAS RN 11141-16-5), Aroclor 1242 (CAS RN 53469-21-9), Aroclor 1248 (CAS RN 12672-29-6), Aroclor 1254 (CAS RN 11097-69-1), and Aroclor 1260 (CAS RN 11096-82-5).

Note 8: Toxaphene: This entry includes congener chemicals contained in technical toxaphene (CAS RN 8001-35-2, i.e., chlorinated camphene.

Note 9: Xylene (total): This entry includes o-xylene (CAS RN 96-47-6), m-xylene (CAS RN 108-38-3), p-xylene (CAS RN 106-42-3), and unspecified xylenes (dimethylbenzenes) (CAS RN 1330-20-7).

Appendix III
Ground water monitoring parameters

A. Wastes Generated From Fuel Burning Operations Using Primarily Coal as Fuel [OAC 3745-30-01(B)(1)]

1. Annual Monitoring Parameters

Temperature*
Specific conductance*
pH*
Calcium**
Chloride**
Potassium**
Sodium**
Sulfate**
Arsenic
Barium
Cadmium
Chromium
Iron
Lead
Magnesium
Manganese
Selenium
Total Dissolved Solids
Gross Beta
Gross Alpha

2. Background Water Quality Parameters #

Temperature*
Specific Conductance*
pH*
Calcium**
Chloride**
Potassium**
Sodium**
Sulfate**
Arsenic
Barium
Cadmium
Chromium
Iron
Lead
Magnesium
Manganese
Mercury
Selenium
Silver
Total Organic Carbon
Chemical Oxygen Demand
Total Dissolved Solids
Gross Beta
Gross Alpha
Turbidity
Total Alkalinity
Phenols***
Cyanide***
The Volatile Organic Compounds listed in Appendix I of this rule***

Parameters determined at least quarterly for initial year of ground water monitoring
* Parameters determined each time a monitoring well is sampled.
** Indicator parameters to be determined at least semi-annually.
*** Only need to sample for initial quarter unless Director determines otherwise.

B. Waste Generated From Foundry Operations [OAC 3745-30-01(B)(2)]

1. Annual Monitoring Parameters

   Temperature*
   Specific conductance*
   pH*
   Copper**
   Fluoride**
   Iron**
   Lead**
   Phenols** *(including cresols)*
   Sulfate**
   Zinc**
   Total dissolved solids**
   Ammonia
   Arsenic
   Barium
   Cadmium
   Chloride
   Chromium
   Lead
   Manganese
   Magnesium
   Sodium
   Turbidity
   Formaldehyde
   The volatile organic compounds (VOCs) detected in background sampling.

2. Background Water Quality Parameters #

   Temperature*
   Specific conductance*
   pH*
   Copper**
   Fluoride**
   Iron**
   Lead**
   Phenols** *(including cresols)*
   Sulfate**
   Zinc**
   Total dissolved solids**
   Ammonia
   Arsenic
   Barium
   Cadmium
   Chloride
   Chromium
   Lead
   Manganese
   Magnesium
   Sodium
   Turbidity
   Formaldehyde
   The volatile organic compounds (VOCs) listed in appendix I of this rule***

Parameters determined at least quarterly for initial year of ground water monitoring

* Parameters determined each time a monitoring well is sampled.

** Based on waste characterization, the owner or operator shall select four (or more) of the double asterisked parameters as indicator parameters to be determined at least semi-annually. The other double-asterisked parameters remain on the annual list.

*** Only need to sample for initial quarter unless Director determines otherwise.

C. Wastes Generated from Pulp and Papermaking Operations
[OAC 3745-30-01(B)(3)]

1. Annual Monitoring Parameters

Temperature*
Specific conductance*
pH*
Chemical Oxygen Demand**
Total Alkalinity**
Sodium**
Sulfate**
Ammonia
Arsenic
Barium
Cadmium
Calcium
Chloride
Chromium
Iron
Lead
Magnesium
Manganese
Nitrate-nitrite
Potassium
Total Dissolved Solids
Turbidity

2. Background Water Quality Parameters #

Temperature*
Specific conductance*
pH*
Chemical Oxygen Demand**
Total Alkalinity**
Sodium**
Sulfate**
Ammonia
Arsenic
Barium
Cadmium
Calcium
Chloride
Chromium
Iron
Lead
Magnesium
Manganese
Nitrate-nitrite
Potassium
Total Dissolved Solids
Turbidity
Phenols***
Cyanide***
The Volatile Organic Compounds listed in Appendix I of this rule***

Parameters determined at least quarterly for initial year of ground water monitoring
* Parameters determined each time a monitoring well is sampled.
** Indicator parameters to be determined at least semi-annually.
*** Only need to sample for initial quarter unless Director determines otherwise.

D. Wastes Generated from Steelmaking Operations [OAC 3745-30-01(B)(4)]

1. Annual Monitoring Parameters

Temperature*
Specific conductance*
pH*
Total Dissolved Solids**
Iron**
Sodium**
Sulfate**
Ammonia
Antimony
Arsenic
Barium
Cadmium
Calcium
Chloride
Chromium
Copper
Lead
Magnesium
Manganese
Mercury
Nickel
Selenium
Sodium
Sulfate
Zinc
Turbidity
. Total Organic Carbon
Gross Beta
Gross Alpha

2. Background Water Quality Parameters #

Temperature*
Specific conductance*
pH*
Total Dissolved Solids**
Iron**
Sodium**
Sulfate**
Ammonia
Antimony
Arsenic
Barium
Cadmium
Calcium
Chloride
Chromium
Copper
Lead
Magnesium
Manganese
Mercury
Nitrate-Nitrite
Nickel
Selenium
Sodium
Sulfate
Zinc
Turbidity
. Total Organic Carbon
Gross Beta
Gross Alpha
Chemical Oxygen Demand
Total Alkalinity
Phenols***
Cyanide***
The Volatile Organic Compounds listed in Appendix I of this rule***

#	Parameters determined at least quarterly for initial year of ground water monitoring
*	Parameters determined each time a monitoring well is sampled.
**	Indicator parameters to be determined at least semi-annually.
***	Only need to sample for initial quarter unless Director determines otherwise.

E. Wastes Generated from Gypsum Processing Plant Operations
[OAC 3745-30-01(B)(5)]

1. Annual Monitoring Parameters

Temperature*
Specific Conductance* **
pH* **
Calcium**
Sulfate**
Arsenic
Barium
Cadmium
Chromium
Chloride
Iron
Lead
Magnesium
Manganese
Mercury
Selenium
Sodium
Chemical Oxygen Demand
Total Alkalinity
Total Dissolved Solids

2. Background Water Quality Parameters #

Temperature*
Specific Conductance* **
pH* **
Calcium**
Sulfate**
Arsenic
Barium
Cadmium
Chromium
Chloride
Iron
Lead
Magnesium
Manganese
Mercury
Nitrate-Nitrite
Selenium
Sodium
Chemical Oxygen Demand
Total Alkalinity
Total Dissolved Solids
Total Organic Carbon
Turbidity
Phenols***
Cyanide***
The Volatile Organic Compounds listed in Appendix I of this rule***

Parameters determined at least quarterly for initial year of ground water monitoring
* Parameters determined each time a monitoring well is sampled.
** Indicator parameters to be determined at least semi-annually.
*** Only need to sample for initial quarter unless Director determines otherwise.

F. Wastes Generated from Lime Processing Operations
[OAC 3745-30-01(B)(6)]

1. Annual Monitoring Parameters

Temperature*
Specific conductance*
pH* **
Chloride**
Potassium**
Sodium**
Sulfate**
Total Dissolved Solids**
Barium
Iron
Lead
Magnesium
Manganese
Selenium
Turbidity
Chemical Oxygen Demand
Total Alkalinity
Gross Beta
Gross Alpha

2. Background Water Quality Parameters #

Temperature*
Specific conductance*
pH* **
Chloride**
Potassium**
Sodium**
Sulfate**
Total Dissolved Solids**
Arsenic
Barium
Calcium
Iron
Lead
Magnesium
Manganese
Selenium
Turbidity
Chemical Oxygen Demand
Total Alkalinity
Gross Beta
Gross Alpha
Phenols***
Cyanide***
The Volatile Organic Compounds listed in Appendix I of this rule***

Parameters determined at least quarterly for initial year of ground water monitoring
* Parameters determined each time a monitoring well is sampled.
** Indicator parameters to be determined at least semi-annually.
*** Only need to sample for initial quarter unless Director determines otherwise.

G. Wastes Generated from Portland Cement Operations [OAC 3745-30-01(B)(7)]

1. Annual Monitoring Parameters

Temperature* Specific conductance* pH* **
Chloride**
Potassium**
Sodium**
Sulfate**
Total Dissolved Solids**
Barium
Chloride
Chromium
Iron
Lead
Magnesium
Manganese
Mercury
Selenium
Turbidity
Chemical Oxygen Demand
Total Alkalinity
Gross Beta
Gross Alpha

2. Background Water Quality Parameters #

Temperature*
Specific Conductance*
pH* **
Chloride**
Potassium**
Sodium**
Sulfate**
Total Dissolved Solids**
Arsenic
Barium
Calcium
Chloride
Chromium
Iron
Lead
Magnesium
Manganese
Mercury
Selenium
Turbidity
Chemical Oxygen Demand
Total Alkalinity
Gross Beta
Gross Alpha
Phenols***
Cyanide***
The Volatile Organic Compounds listed in Appendix I of this rule***

Parameters determined at least quarterly for initial year of ground water monitoring
* Parameters determined each time a monitoring well is sampled.
** Indicator parameters determined at least semi-annually.
*** Only need to sample for initial quarter unless Director determines otherwise.

H. Industrial solid waste facilities permitted and operating under Chapter 3745-29 of the Administrative Code.

1. Annual Monitoring Parameters

Temperature*
Specific conductance*
pH*
Ammonia**
Calcium**
Chloride**
Iron**
Nitrate-nitrite**
Potassium**
Sodium**
Sulfate**
Total alkalinity**
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Copper
Lead
Magnesium
Manganese
Nickel
Selenium
Silver
Thallium
Vanadium
Zinc
Turbidity
Chemical oxygen demand
Total dissolved solids
The volatile organic compounds (VOCS) listed in appendix I of this rule

2. Background Water Quality Parameters #

Background Water Quality Parameters are the same as Annual Monitoring Parameters.

Parameters determined at least quarterly for initial year of ground water monitoring.

Analysis for these parameters shall be representative of the quality background ground water that has not been affected by past or present operations at the landfill facility and representative of the quality of ground water passing directly downgradient of the limits of solid waste placement.

* Parameters field analyzed each time a monitoring well is sampled.

** Indicator parameters determined at least semi-annually.

*** DRAFT - NOT YET FILED ***

3745-30-09 **Final closure of residual waste landfill facilities.**

(A) For all residual waste landfill facilities, a "final closure/post-closure plan" containing the following information shall be submitted to the director for approval as part of a permit to install application for a new residual waste landfill facility or the expansion of an existing residual waste landfill facility, or as part of a permit to install application submitted in response to division (A)(3) or (A)(4) of section 3734.05 of the Revised Code, and not later than one hundred eighty days prior to the anticipated date to cease accepting residual waste.

(1) The name and location of the facility.

(2) Any variances or exemptions from the requirements of this rule or rule 3745-30-10 of the Administrative Code, or any alternate cap material or thickness or cap slope, or any alternative schedule for completing final closure activities.

[Comment: If a variance, exemption, or alternative is identified, the request must be submitted to the director and must receive prior approval; otherwise, the rule requirements are applicable and enforceable.]

(3) Name, address, and telephone number of the person or office to contact regarding the residual waste landfill facility during the final closure and post-closure care periods.

(4) The following information to be presented in the same manner as outlined in rule 3745-30-05 of the Administrative Code:

(a) Plan drawings of the horizontal limits and top elevations of waste and the cap system; and surface water control structures including permanent ditches to control run-on and runoff; and sedimentation ponds including the inlet and outlet.

(b) Establish a grid system with northings and eastings not more than five hundred feet apart.

(c) Detail drawings of the cap system including but not limited to the key trench, any penetrations, cap drainage structures, and surface water drainage structures

(d) Detail drawings of sedimentation pond and discharge structures and surface water run-on and runoff control structures.

*** DRAFT - NOT YET FILED ***

(e) Static and seismic stability analysis.

(f) The ground water detection monitoring plan.

(g) The financial assurance information in accordance with rules 3745-27-15 and 3745-27-16 of the Administrative Code, as applicable.

(5) Description of on-site availability and suitability of cap material.

(6) Quality assurance/quality control plan for cap system construction.

(7) Explosive gas monitoring plan, for residual waste landfill facilities which are required to have an explosive gas monitoring system by paragraph (E) of rule 3745-30-06 of the Administrative Code.

(8) Schedule of installation of any explosive gas control systems.

(9) Description of anticipated measures to control erosion during closure.

(B) It is the responsibility of the owner or operator to complete final closure of the residual waste landfill facility in a manner that minimizes the need for further maintenance and minimizes post-closure formation and release of leachate and explosive gases to air, soil, ground water, or surface water to the extent necessary to protect human health and the environment.

(C) Mandatory closure. The owner or operator shall begin final closure activities in accordance with the final closure/post-closure plan and paragraph (F) of this rule no later than seven days after any of the occurrences specified in this paragraph. Approval of the final closure/post-closure plan does not affect the owner's or operator's obligations to begin and complete final closure activities in accordance with paragraph (F) of this rule. It is mandatory to begin closure activities for a residual solid waste landfill facility upon the occurrences of any of the following:

(1) The owner or operator declares that no more residual waste will be accepted for disposal at the residual waste landfill facility.

(2) A solid waste license issued for the residual waste landfill facility has expired, and another license has not been applied for in the manner prescribed in Chapter 3745-37 of the Administrative Code.

*** DRAFT - NOT YET FILED ***

(3) All approved limits of residual waste placement have been reached.

(4) A solid waste license issued for the residual waste landfill facility has expired, and another license has been applied for and denied as a final action.

(5) A solid waste license issued for the residual waste landfill facility has been revoked as a final action.

(6) A solid waste license issued for the residual waste landfill facility has been suspended as a final action.

(D) Notification of anticipated date to cease acceptance of solid waste.

(1) The owner or operator shall provide notice by certified mail or any other form of mail accompanied by a receipt of the anticipated date on which the residual waste landfill facility will cease to accept solid waste if final closure is to be triggered by an occurrence described in paragraph (C)(1), (C)(2), or (C)(3) of this rule. Such notice shall be provided not less than ninety days prior to the anticipated date on which solid waste will cease to be accepted.

(2) The owner or operator shall send a copy of the notice specified in paragraph (D)(1) of this rule to the following:

(a) The board of health having jurisdiction.

(b) The single county or joint county solid waste planning district in which the facility is located.

(c) The director.

(3) Concurrently with the submission of the notice required by paragraph (D)(1) of this rule, the owner or operator shall commence publishing at three-week intervals, prominent notice of the anticipated date on which solid waste will cease to be accepted at the residual waste landfill facility. Such notice shall be published in the county in which the residual waste landfill facility is located and in any other county which has been a source of at least twenty-five per cent of the solid wastes deposited at the residual waste landfill facility over the previous twelve months of operation. Notice shall be provided to the director and the board of health having jurisdiction that affirms the notices have been published in accordance with this paragraph. The public notice requirement shall not apply to a residual waste landfill facility owned by a

*** DRAFT - NOT YET FILED ***

generator, exclusively disposing of solid wastes generated at the premises owned by the generator.

(4) Not less than thirty days prior to the anticipated date on which the facility will cease to accept solid waste, notice shall be provided by certified mail or any other form of mail accompanied by a receipt to the director of any changes to the information that identifies the facility's final closure contact person.

(E) The owner or operator shall send notification by certified mail or any other form of mail accompanied by a receipt to the director and to the board of health having jurisdiction, as to the actual date that the residual waste landfill facility ceased to accept residual waste. Notification shall be sent to the director and the board of health having jurisdiction not later than seven days after the date specified in the notification.

(F) The owner or operator shall begin final closure activities not later than seven days after the residual waste landfill facility has ceased to accept residual waste. Final closure activities for all residual waste landfill facilities shall include, at a minimum the following:

(1) Blocking, by locked gates, fencing, or other sturdy obstacles, of all entrances and access roads to the residual waste landfill facility to prevent unauthorized access during the final closure and post-closure period.

(2) Posting of signs, in such a manner as to be easily visible from all access roads leading onto the residual waste landfill facility, stating in letters not less than three inches high that the residual waste landfill facility no longer accepts residual waste. Signs shall be maintained in legible condition for not less than two years after final closure activities have been completed. This paragraph shall not apply to residual waste landfill facilities owned and operated by a generator of residual wastes if the residual waste landfill facility exclusively disposes of residual wastes generated at one or more premises owned by the generator.

(3) Construction of a cap system in all areas of residual waste placement, other than those which have been capped in accordance with paragraph (V)(3)(b) of rule 3745-30-14 of the Administrative Code, which shall minimize infiltration and shall, at a minimum, consist of the following:

(a) First, a recompacted soil barrier layer, a minimum of two feet thick, constructed in accordance with the specifications in rule 3745-30-07 of the Administrative Code and modeled by the construction of a test pad

*** DRAFT - NOT YET FILED ***

in accordance with rule 3745-30-07 of the Administrative Code.

(b) A vegetative layer, consisting of soil and vegetation, placed on top of the soil barrier layer. The soil shall be of sufficient thickness and fertility to support its vegetation and to protect the soil barrier layer from damage due to root penetration, and for facilities with disposed waste generally having a permeability greater than 1×10^{-5} cm/sec, the soil shall be of a thickness such that the top of the recompacted soil barrier layer lies below the local frost depth.

Comparable materials and/or thicknesses for the soil barrier layer and soil vegetative layer may be used if approved by the director.

The cap system shall have a minimum slope of two per cent and a maximum slope of twenty-five per cent, or some alternate slope based on stability analyses. The cap system shall have a maximum projected erosion rate of five tons per acre per year.

Any penetrations into the cap system shall be sealed so that the integrity of the soil barrier layer is maintained.

(4) The owner or operator shall install the required surface water control structures including permanent ditches to control run-on and runoff and sedimentation pond(s), as shown in the final closure/post-closure plan, and as necessary, grade all land surfaces to prevent ponding of water where residual waste has been placed and institute measures to control erosion.

[Comment: The minimum slope standard in rule 3745-30-07 of the Administrative Code is a design standard. For closure certification, it is not necessary to regrade the site if there is not a ponding problem, even if the slope no longer meets the design in the closure/post-closure plan.]

(5) Design, installation, and maintenance of a ground-water monitoring system in accordance with rule 3745-30-08 of the Administrative Code, if not in place.

(6) The owner or operator shall record on the plat and deed to the residual waste landfill facility property, or on some other instrument which is normally examined during title search, that will in perpetuity notify any potential purchaser of the property, a notation describing the impacted acreage, exact location, depth, volume, and nature of the residual waste deposited in the residual waste landfill facility.

(7) Continue to comply with rule 3745-30-14 of the Administrative Code and all

*** DRAFT - NOT YET FILED ***

monitoring and reporting activities required during the operating life of the residual solid waste landfill facility until the closure certification is submitted and the post-closure care period begins.

(G) Final closure activities shall be completed not later than one year after final receipt of residual waste in the residual waste landfill facility unless an alternate schedule has been approved by the director.

(H) Final closure certification. Not later than ninety days after the completion of final closure activities, the owner or operator shall submit to the director, and to the board of health having jurisdiction, a written certification report. The final closure certification shall include verification that the residual waste landfill facility has been closed in accordance with this rule and the "final closure/post-closure plan". The final closure certification shall at a minimum include the following:

(1) A list of the construction certification reports for construction of the cap system with the date of submittal and a topographic map of the entire residual waste landfill facility showing the areas certified by each report. The map shall also show the horizontal limits of waste placement and the surface water control structures including permanent ditches to control run-on and runoff, and the following if present: the sedimentation pond(s) including the inlet and outlet, the outlet of any permanent ground water control structures, and the explosive gas control system.

(2) A demonstration that the ground water monitoring system meets the requirements of rule 3745-30-08 of the Administrative Code.

(3) A copy of the plat and deed or other instrument which is normally examined during a title search, showing the notation required by paragraph (F)(6) of this rule and bearing the mark of recordation of the office of the county recorder for the county in which the property is located.

(4) A demonstration that all entrances and access roads have been blocked as required by paragraph (F)(1) of this rule, and the sign required by paragraph (F)(2) has been posted.

(I) The health commissioner and the director, or their authorized representatives, upon proper identification, may enter any residual waste landfill facility at any time during the final closure period for the purpose of determining compliance with this rule.

*** DRAFT - NOT YET FILED ***

3745-30-10 **Post-closure care of residual waste landfill facilities.**

(A) Following completion of final closure activities in accordance with rule 3745-30-09 of the Administrative Code the owner, operator, or permittee shall conduct post-closure care activities at the residual waste landfill facility for the following applicable time period:

(1) Thirty years if the facility is a class I residual waste landfill.

(2) Twenty years if the facility is a class II residual waste landfill.

(3) Fifteen years if the facility is a class III residual waste landfill.

The post-closure care period begins when the certification required by paragraph (H) of rule 3745-30-09 of the Administrative Code has been submitted for the residual waste landfill facility.

(B) Any time during the post-closure period, based on such factors as the inspection or monitoring results required by paragraphs (C)(4) and (C)(5) of this rule and whether human health or safety or the environment is or will be protected, or whether a nuisance is or will be created, the director may do either of the following:

(1) Shorten the post-closure care period required by paragraph (A) of this rule, if a variance has been requested pursuant to rule 3745-30-15 of the Administrative Code and the director finds that the reduced period is sufficient to protect human health and the environment, based on such factors as the inspection and monitoring results required by paragraphs (C)(4) and (C)(5) of this rule.

(2) Extend the post-closure care period required by paragraph (A) of this rule, if the director finds that the extended period is necessary to protect human health and the environment, based on such factors as the inspection and monitoring results required by paragraphs (C)(4) and (C)(5) of this rule.

[Comment: If the landfill shows an improvement to leachate quality, the quantity of leachate generated will not cause an outbreak or slope failure, that ground water monitoring is no longer needed, that it is not generating explosive gas which has the potential to migrate underground, and that the cap system will maintain its integrity and stability if post-closure care activities cease, the director may release the owner, operator, or permittee from continuing post-closure care activities.]

(C) Post-closure care activities for all residual waste landfill facilities shall include, but are not limited to the following:

*** DRAFT - NOT YET FILED ***

(1) Continuing operation and maintenance of the leachate management system, the surface water management system, any explosive gas extraction and/or control system, any explosive gas monitoring system, and the ground water monitoring system.

(2) Maintaining the integrity and effectiveness of the cap system, including making repairs to the cap system as necessary to correct the effects of settling, dead vegetation, subsidence, ponding, erosion, or other events, and preventing run-on and runoff from eroding or otherwise damaging the cap system.

(3) Repairing any leachate outbreaks detected at the residual waste landfill facility by doing the following:

(a) Contain and properly manage the leachate at the residual waste landfill facility.

(b) If necessary, collect, treat, and dispose of the leachate, including, if necessary, following the contingency plan for leachate storage and disposal prepared pursuant to rule 3745-30-14 of the Administrative Code.

(c) Take action to minimize, control, or eliminate the conditions which contribute to the production of leachate.

(4) Quarterly inspection of the residual waste landfill facility during each year of the post-closure care period and submittal of a written summary to the appropriate Ohio EPA district office not later than fifteen days after the inspection date detailing the results of the inspection and a schedule of any actions to be taken to maintain compliance with paragraphs (C)(1), (C)(2), and (C)(3) of this rule. The director may either increase the frequency of inspections, or, upon the request of the permittee, decrease the frequency of inspections if the results of past inspections justify either action.

(5) Fulfilling all monitoring and reporting requirements in accordance with rule 3745-30-08 of the Administrative Code for ground water, and, if necessary, with rule 3745-27-12 of the Administrative Code for explosive gas, and with any monitoring required by any orders or authorizing documents. The post-closure care period may be shortened for explosive gas monitoring, as outlined in paragraph (L) of rule 3745-27-12 of the Administrative Code.

(6) Submitting a report to the appropriate Ohio EPA district office and approved health department not later than the first day of April of each year, which

*** DRAFT - NOT YET FILED ***

contains the following:

(a) A summary of the quantity of leachate collected for treatment and disposal on a monthly basis during the year, and the location of leachate treatment and/or disposal.

(b) Results of analytical testing of an annual grab sample of leachate for the parameters specified in paragraph (A) of rule 3745-30-03 of the Administrative Code. The grab sample shall be obtained from the leachate management system.

(c) The most recent updated post-closure cost estimate adjusted for inflation and for any change in the post-closure cost estimate required by rule 3745-27-16 of the Administrative Code.

(7) Records and reports generated by paragraphs (C)(4) to (C)(6) of this rule are to be kept for the duration of the post-closure care period at a location where the records and reports are available for inspection by Ohio EPA or the approved health department during normal working hours.

(D) Upon completion of the post-closure care period, the owner, operator, or permittee shall submit to the director written certification that the residual waste landfill facility has completed post-closure activities in accordance with this rule and the "final closure/post-closure plan." This certification shall be accompanied by documentation which demonstrates that all post-closure care activities have been completed. The certification shall be signed and sealed by a professional engineer registered in Ohio.

(E) The health commissioner and the director, or their authorized representatives, upon proper identification, may enter any closed residual waste landfill facility at any time during the post-closure care period for the purpose of determining compliance with this rule.

*** DRAFT - NOT YET FILED ***

3745-30-14 **Operation of residual waste landfill facilities.**

(A) Applicability.

The owner or operator of a residual solid waste landfill facility shall comply with the requirements and operational criteria specified in this rule until the final closure certification required by rule 3745-30-09 of the Administrative Code is submitted and the post-closure care period begins.

(B) Compliance.

(1) The owner or operator shall conduct all operations at a residual solid waste landfill facility in strict compliance with the terms and conditions of the solid waste disposal license issued for the facility in accordance with Chapter 3745-37 of the Administrative Code.

(2) The owner or operator shall conduct all construction and operation at a residual solid waste landfill facility in strict compliance with the applicable authorizing document(s), including permit(s) to install, a plan approval, an operational report, an approved final closure plan, or an alteration(s) concurred with in writing by Ohio EPA, except as follows:

(a) For a residual solid waste landfill facility with a plan approval issued by the Ohio department of health, an operational report submitted in accordance with paragraph (J) or (K) of rule 3745-27-09 of the Administrative Code, as effective July 29, 1976, or a permit to install approved prior to January 1, 1980, the owner or operator shall conduct operations in strict compliance with the plan approval, operational report, or a permit to install, whichever document is applicable, unless either of the following have subsequently occurred:

(i) The owner or operator of a residual solid waste landfill facility has obtained a permit to install pursuant to the conditions and schedule outlined in division (A)(3) or (A)(4) of section 3734.05 of the Revised Code.

(ii) The owner or operator has obtained written concurrence from Ohio EPA for the alteration of the residual solid waste landfill facility or the owner or operator has obtained a permit to install prior to modifying the residual solid waste landfill facility.

[Comment: "Alteration" is defined in rule 3745-27-01 of the Administrative Code; "modification" is defined in rule 3745-27-02 of the Administrative Code.]

*** DRAFT - NOT YET FILED ***

(3) The owner or operator shall operate the facility in such a manner that noise, dust, and odors are strictly controlled so as not to cause a nuisance or a health hazard.

(4) The owner or operator of a residual solid waste facility as defined in paragraph (B)(3) of rule 3745-30-01 of the Administrative Code shall operate the facility in such a manner that the attraction, breeding, and emergence of insects, rodents, and other vectors are strictly controlled so as not to cause a nuisance or a health hazard. The owner or operator shall initiate effective supplemental vector control measures as deemed necessary by the health commissioner or the director.

(5) The owner or operator shall operate the facility in such a manner that the operation does not cause water pollution pursuant to Chapter 6111. of the Revised Code, and does not violate any regulation adopted by the director pursuant to Chapter 3704. of the Revised Code.

(6) The owner or operator shall comply with all of the following:

(a) The applicable design, construction and testing specifications in rule 3745-30-07 of the Administrative Code.

(b) The ground water monitoring, assessment, and corrective measures requirements of rule 3745-30-08 of the Administrative Code.

(c) The final closure, post-closure care, and financial assurance requirements of rules 3745-27-15, 3745-27-16, 3745-30-09, and 3745-30-10 of the Administrative Code.

(C) Construction certification, approval, and compliance.

(1) Construction certification and approval. After the installation of any of the engineered components specified in rule 3745-30-07 of the Administrative Code, other than the cap system, in any phase of a residual solid waste landfill facility, the owner or operator shall not accept waste in the phase until all of the following occur:

(a) A certification report for that phase, prepared in accordance with rule 3745-30-07 of the Administrative Code, has been submitted to Ohio EPA and the approved health department.

*** DRAFT - NOT YET FILED ***

(b) The owner or operator has received written concurrence from the appropriate Ohio EPA district office for the specific components of that phase specified in rule 3745-30-07 of the Administrative Code and any applicable authorizing document(s).

(2) Construction compliance. Upon discovery by the owner or operator, or upon notification by Ohio EPA, that a failed test or alternation has occurred in construction of any engineered component or portion of a residual solid waste landfill facility, the owner or operator shall comply with the procedures outlined in this paragraph.

(a) Failed test. For the purposes of this rule, a "failed test" occurs when a test performed on a component of the residual solid waste landfill facility yields a result that does not meet the specifications outlined in the applicable authorizing document(s) specified in paragraph (B) of this rule or other requirements of these rules. If, prior to submission of the construction certification report for the component or portion of the residual solid waste landfill facility, the owner or operator determines that there is a "failed test," the owner or operator shall do the following:

(i) Assess the component or portion of the facility to determine if construction is in compliance with the applicable authorizing document(s) or other requirements of these rules.

(ii) Implement measures to attain compliance with the applicable authorizing document or other requirements of these rules. An area with a verified failure must be reconstructed. Reconstructed areas must be retested at a frequency sufficient to demonstrate to the director that compliance has been achieved.

(b) Alteration.

If, prior to submission of the construction certification report for the component or portion of the residual solid waste landfill facility, the owner or operator determines that there is an alteration, the owner or operator shall do all of the following:

(i) Include the applicable testing results and an explanation of the alteration(s) in the certification report "alterations" section required by rule 3745-30-07 of the Administrative Code.

(ii) Provide a demonstration in the certification report that the

*** DRAFT - NOT YET FILED ***

alteration(s) is at least equivalent to the requirement in the applicable authorizing document(s) or other requirements of these rules.

(iii) Submit the certification report to Ohio EPA and the approved health department.

(iv) Continue to comply with paragraph (C)(1) of this rule.

[Comment: Paragraph (C)(2)(b) of this rule applies only to a change that qualifies as an alteration as that term is defined in rule 3745-27-01 of the Administrative Code. Rule 3745-27-02 and paragraph (A) of rule 3745-30-05 of the Administrative Code require an owner or operator to obtain a permit to install prior to the establishment of a new, or modification of an existing residual solid waste landfill facility. Obtaining concurrence for an alteration in accordance with the procedures outlined in paragraph (C)(2) of this rule does not relieve the owner or operator from liability for failure to obtain a permit to install to modify the facility if the change being addressed constitutes a modification.]

(c) Detection after submission of certification report. If the owner or operator determines that the certification report is in error because a "failed test" or an alteration was detected after submission of the construction certification report to Ohio EPA, the owner or operator shall do the following:

(i) Notify, within twenty-four hours after discovery by phone and within seven days after discovery in writing, the appropriate Ohio EPA district office and the approved health department of the noncompliance.

(ii) Within fourteen days of submitting the written notification required by paragraph (C)(2)(c)(i) of this rule, do either of the following:

(a) Implement compliance with the applicable steps outlined in paragraph (C)(2)(a) of this rule and amend and resubmit the construction certification report to explain the circumstances and how compliance was achieved.

(b) Submit the information required by paragraph (C)(2)(b) of this rule.

*** DRAFT - NOT YET FILED ***

[Comment: Compliance with paragraph (C)(2)(c) of this rule does not relieve the owner or operator from liability for failure to construct or operate the sanitary landfill facility in strict compliance with the applicable authorizing document(s), other requirements of these rules, or failure to submit a certification report that is true, accurate, and complete as required by the construction certification requirements of rule 3745-30-07 of the Administrative Code.]

(D) [Reserved.]

(E) General operational criteria.

(1) Construction.

(a) The owner or operator shall clear naturally occurring vegetation to the extent necessary for proper operation of the facility.

(b) Any oil wells and gas wells within the proposed limits of residual waste placement shall be properly plugged and abandoned in accordance with Chapter 1509. of the Revised Code.

(c) The owner or operator shall maintain the integrity of the engineered components of the residual solid waste landfill facility and repair any damage to or failure of the components. "Engineered components" include the components described in rule 3745-30-07 of the Administrative Code and components of the monitoring system(s) installed in accordance with rule 3745-30-08 of the Administrative Code. Failed or damaged engineered components shall be investigated and reconstructed in strict compliance with the existing applicable authorizing documents. If a redesign is necessary, prior approval of an alteration or a modification shall be obtained.

(d) The owner or operator shall perform chemical compatibility testing if the director determines that such testing is necessary to demonstrate that the residual solid waste to be received at the residual solid waste landfill facility will not compromise the integrity of any material used to construct the residual solid waste landfill facility.

(e) The stability of the residual waste fill shall be sufficient to support the equipment necessary for daily operations, including waste deposition at

*** DRAFT - NOT YET FILED ***

the working face, for the spreading of waste in layers, and if appropriate, for waste compaction. The stability of the residual waste fill shall also be sufficient to facilitate the application of intermediate cover and the construction of the final cap system as required by paragraph (H) of this rule. Residual waste shall be deposited at the working face except as otherwise provided by paragraphs (E)(7)(a) and (E)(7)(d) of this rule.

(f) One or more residual wastes that meet the requirements in paragraph (B) of rule 3745-30-03 of the Administrative Code may be mixed to improve fill stability and/or to comply with this rule. The resultant mixture of wastes shall be deposited in a residual waste landfill constructed in accordance with the specifications for the most environmentally protective residual waste landfill class required by the components of the mixture.

(2) Access.

(a) The owner or operator shall construct and maintain all-weather access roads within the facility boundary in such a manner as to withstand the anticipated degree of use and allow passage of the loaded refuse vehicles at all times, with a minimum of erosion and dust generation.

(b) The owner or operator shall limit access to the facility by non-employees except during operating hours when operating personnel are present. The owner or operator shall, at all times, limit access to the facility as necessary to prevent scavenging and salvaging operations not conducted in accordance with paragraph (E)(4) of this rule. This paragraph shall not apply to the health commissioner or the director who, upon proper identification, may enter the facility at any time to determine compliance with Chapter 3745-30 of the Administrative Code.

(c) The owner or operator shall exclude live domestic and farm animals from the operating areas of the facility, except for animals used for security purposes.

(3) Equipment.

(a) If the residual waste disposed of at the facility poses a threat of fire, the owner or operator shall have adequate equipment, material, and services available at or near the facility to control fire. The owner or operator

*** DRAFT - NOT YET FILED ***

shall act immediately to control or extinguish any fire.

(b) The owner or operator shall ensure that operable equipment of adequate size and quantity for the operations of the facility are available at all times, or that an appropriate contingency plan is prepared to properly handle and dispose of waste materials in the event of equipment failure.

(4) Scavenging and salvaging.

The owner or operator may only conduct salvaging in a manner approved by the director. Scavenging is prohibited.

(5) Personnel.

The owner or operator shall ensure that any individual meeting the definition of operator specified in rule 3745-27-01 of the Administrative Code shall be thoroughly familiar with the proper operational procedures, license, permits, and other authorizations pertaining to the facility.

(6) Inclement weather.

The owner or operator shall ensure preparations have been made such that, during inclement weather, the residual solid waste landfill facility is able to receive, compact, and cover incoming residual solid waste. The preparations shall include, but need not be limited to, designation and preparation of areas where residual solid waste will be deposited, compacted, and covered during inclement weather, construction and maintenance of all-weather access roads leading from the point(s) where loaded vehicles enter the site to the inclement weather areas, and stockpiling of cover material.

(7) Waste acceptance and placement.

(a) Prior to accepting residual solid waste at a unit(s) of a new residual solid waste landfill facility, or in any unit(s) of a lateral expansion area, or in a vertical expansion approved on or after March 1, 1990, the owner or operator shall comply with all applicable requirements for leachate treatment and/or disposal, discharges to surface waters, management of surface water runoff, and air emissions.

(b) The owner or operator shall not begin filling in a new phase, without completing the previous phase, except to the extent necessary for the proper operation of the residual solid waste landfill facility.

*** DRAFT - NOT YET FILED ***

(c) The owner or operator shall confine unloading of waste materials to the smallest practical area(s). The owner or operator shall ensure that each unloading area is supervised by a person or persons knowledgeable regarding operations at the working face.

(d) The owner or operator shall not deposit waste that is burning or is at a temperature likely to cause fire at the working face. Prior to placing the waste at the working face, the owner or operator shall deposit such material in a separate location which is at a sufficient distance from the working face to prevent fires from spreading to the working face and shall immediately extinguish the fire or lower the temperature of the waste.

(e) The owner or operator shall employ all necessary means to ensure that dusty materials are handled, compacted, and covered in such a manner as to minimize the amount of dust that is generated by those materials.

(f) The owner or operator shall exclusively accept for disposal residual waste as defined in paragraph (B) of rule 3745-30-01 of the Administrative Code and may also accept for disposal nontoxic fly ash, nontoxic bottom ash, or nontoxic spent foundry sand.

(8) Disposal restrictions.

The owner or operator shall not accept for disposal or dispose of any of the following materials at a residual solid waste landfill facility:

(a) Asbestos or asbestos-containing waste material that is subject to the provisions of NESHAP, 40 CFR Part 61, subpart M, July 1, 2003.

(b) Containerized bulk liquids or non-containerized liquids without authorization from the director.

(c) Materials that are defined as hazardous wastes pursuant to rule 3745-51-03 of the Administrative Code.

(d) Polychlorinated biphenyls (PCB) wastes.

(e) Low-level radioactive wastes as specified in section 3734.027 of the Revised Code.

*** DRAFT - NOT YET FILED ***

(f) Semi-solid material containing free liquids, as determined by results obtained from conducting method 9095 (1996)(paint filter liquids test) in SW-846, third edition: "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," on the semi-solid material, unless the owner or operator has obtained prior written authorization from Ohio EPA to dispose of that semi-solid material in the facility.

(9) Daily log of operations.

(a) The owner or operator shall keep a daily log of operations of the facility that contains all the information specified on forms prescribed by the director. All entries required by the log form shall be completed. The owner or operator of the facility may use alternate forms, either in paper or electronic formats, for the daily log of operations, provided that all of the information requested on the prescribed forms is present.

(b) A copy of the log shall be available for inspection by the health commissioner or the director during normal operating hours.

(c) When required by Ohio EPA, the owner or operator shall submit log forms or summaries of daily logs to the health commissioner or the director on either paper or electronic versions of forms prescribed by the director. The owner or operator may use alternate forms, either in paper or electronic formats, for the log forms or summary of daily logs, provided that all of the information requested on the prescribed forms is present.

(d) The owner or operator shall make the completed daily logs available for inspection at the facility for a minimum of three years. The records retention period may be extended during the course of any unresolved litigation or when so requested by Ohio EPA. The three-year period for retention of records shall begin on the date the daily log form is completed.

(10) Inspection.

(a) The owner or operator shall inspect the residual waste landfill facility at least daily for ponding, erosion, and leachate outbreaks. Written results of the inspections, including any corrective actions employed, should be made available to the health commissioner or the director upon request.

(b) The owner or operator shall inspect sedimentation ponds and

*** DRAFT - NOT YET FILED ***

sedimentation pond discharge structures, including pipes, ditches, and culverts, at least weekly for erosion, clogging, or failure, and take prompt corrective action, if necessary. A log including inspection results, any corrective actions, and the date and weather conditions for any water quality samples, shall be maintained and provided to Ohio EPA or the authorized local health department upon request.

(11) Approved permit to install, detail plans and specifications.

The owner or operator shall ensure that a copy of the approved permit to install, detail plans, specifications and information is maintained at the residual solid waste landfill facility and is available and may be inspected by the health commissioner or the director upon request during normal operating hours.

(12) The owner or operator of a facility shall not admit waste materials to any area of the facility until all site preparations for that area have been completed, all necessary equipment has been brought to the facility, the facility has been adequately prepared for operation, and the prepared site has been inspected by the health commissioner or Ohio EPA.

(13) Sedimentation ponds shall be cleaned out completely, to ensure the proper operation of the ponds, when the volume of settled particles necessitates cleaning based either on inspection results or on the sediment pond design calculations required by paragraph (C)(5)(n) of rule 3745-30-05 of the Administrative Code.

(14) Financial assurance.

(a) The owner or operator shall annually review, analyze, adjust, and submit the final closure cost estimate and post-closure care cost estimate in accordance with paragraph (D) of rule 3745-27-15 and paragraph (D) of rule 3745-27-16 of the Administrative Code.

(b) The owner or operator shall revise and submit the financial assurance instrument in accordance with paragraph (D) of rule 3745-27-15 and paragraph (D) of rule 3745-27-16 of the Administrative Code.

(F) Daily cover.

(1) Daily cover is not required for residual waste landfills which exclusively accept for disposal residual waste as defined in paragraphs (B)(1), (B)(2), (B)(4),

*** DRAFT - NOT YET FILED ***

(B)(5), (B)(6), and (B)(7) of rule 3745-30-01 of the Administrative Code. Residual waste facilities as defined in paragraphs (B)(1), (B)(2), (B)(4), (B)(5), (B)(6), and (B)(7) of rule 3745-30-01 of the Administrative Code may also accept for disposal nontoxic fly ash, nontoxic bottom ash, or nontoxic spent foundry sand.

(2) The daily cover requirement for residual waste landfills which dispose of residual waste as defined in paragraph (B)(3) of rule 3745-30-01 of the Administrative Code will be determined by the director on a site specific basis in evaluating either a permit to install application or a residual waste landfill license designation as described in paragraph (C) of rule 3745-30-02 of the Administrative Code.

(3) Daily cover shall be applied to all exposed residual solid waste by the end of the working day to control fire hazards, blowing litter, odors, insects, vectors, and rodents. In no event shall residual solid wastes be exposed for more than twenty-four hours after unloading. Daily cover material shall be nonputrescible, shall not contain large objects in such quantities as may interfere with its application and intended purpose, and shall not be residual solid waste, unless the owner or operator has received prior, written authorization in accordance with paragraph (F)(4)(b) of this rule.

(4) Alternate daily cover.

(a) The director may approve residual solid waste to be used as alternative material for daily cover if the residual solid waste is nonputrescible and the owner or operator can demonstrate to the satisfaction of the director that the proposed residual solid waste provides protection that is comparable to six inches of soil and is protective of human health and the environment. The owner or operator must obtain written approval to use residual solid waste for daily cover prior to utilizing the residual solid waste.

(b) The director may approve other materials and/or thicknesses for daily cover if the owner or operator can demonstrate to the satisfaction of Ohio EPA that the proposed alternative material and/or thickness provides protection that is comparable to six inches of soil and is protective of human health and the environment. The owner or operator must obtain written approval to use an alternative material and/or thickness for daily cover prior to utilizing the alternative material and/or thickness.

*** DRAFT - NOT YET FILED ***

(G) Intermediate cover.

(1) To minimize infiltration, intermediate cover shall be applied to all filled areas of a residual solid waste landfill facility where additional residual solid waste is not to be deposited for at least one hundred eighty days. The director may approve the use of some alternate time period, if the owner or operator can demonstrate to the satisfaction of the director that, by use of the alternate time period, infiltration will not be increased.

(2) Intermediate cover material shall be nonputrescible and have low permeability to water, good compactability, cohesiveness, and relatively uniform texture, and shall not contain large objects in such quantities as may interfere with its application and intended purpose. A twelve inch thick layer of soil, consisting of well-compacted loan, silt loam, clay loam, silty clay loam, silty clay or some combination thereof, shall be used. The owner or operator may use other materials and/or thicknesses for intermediate cover if the owner or operator can demonstrate to the satisfaction of the director that the proposed intermediate cover material and/or thickness provides comparable and adequate protection.

(3) Intermediate cover in an area shall be removed or otherwise prepared as necessary prior to the placement of the next layer of residual solid waste in that area so as not to impede the flow of leachate to the leachate management system within the limits of residual solid waste placement.

(4) The owner or operator shall perform measures to protect the intermediate cover from erosion.

(H) Final cover.

Within seven days of reaching the approved final elevations of solid waste placement in a phase, the owner or operator shall begin constructing the final cap system in accordance with rule 3745-30-09 of the Administrative Code.

(I) Scales.

The owner or operator of a residual solid waste landfill facility, with an authorized maximum daily waste receipt greater than two hundred tons per day, shall use scales as the sole means of determining gate receipts. All scales shall be inspected, tested, and approved by the county auditor or city sealer having jurisdiction where the scale is located and shall meet the specifications, tolerances, and regulatory requirements of section 1327.49 of the Revised Code. This paragraph shall not

*** DRAFT - NOT YET FILED ***

apply to a residual solid waste landfill facility owned by the generator that exclusively disposes of residual solid wastes generated at one or more premises owned by the generator.

(J) Surface water management.

(1) The owner or operator shall ensure that surface water at a residual solid waste landfill facility is diverted from areas where residual solid waste is being, or has been, deposited. The owner or operator shall ensure that a residual solid waste landfill facility is designed, constructed, maintained, and provided with surface water control structures that control run-on and runoff of surface water. These surface water control structures shall ensure minimal erosion and infiltration of water through the cover material and cap system. These surface water control structures shall be designed in accordance with rule 3745-30-07 of the Administrative Code.

(2) If ponding or erosion occurs on areas of the residual solid waste landfill facility where residual solid waste is being, or has been, deposited, the owner or operator shall undertake actions as necessary to correct the conditions causing the ponding or erosion.

(3) If a substantial threat of surface water pollution exists, the health commissioner or the director upon request may require the owner or operator to monitor the surface water.

(K) Leachate management.

(1) If a leachate outbreak(s) occurs at the residual solid waste landfill facility, the owner or operator shall repair the outbreak(s) and do the following:

(a) Contain and properly manage the leachate at the residual solid waste landfill facility.

(b) If necessary, collect and dispose of the leachate in accordance with paragraphs (K)(5) and (K)(6) of this rule.

(c) Take action to minimize, control, or eliminate the conditions which contribute to the production of leachate.

(2) If the owner or operator utilizes pumps for leachate, the owner or operator shall maintain at least one lift station back-up pump at the residual solid waste

*** DRAFT - NOT YET FILED ***

landfill facility at all times.

(3) The owner or operator shall inspect the collection pipe network of the leachate management system after placement of the initial lift of residual solid waste to ensure that crushing of the collection pipe network has not occurred and shall inspect the collection pipe network annually thereafter to ensure that clogging of the collection pipe network has not occurred.

(4) If authorized in accordance with rule 3745-30-15 of the Administrative Code, the owner or operator may temporarily store leachate within the limits of waste placement until the leachate can be treated and disposed as outlined in the leachate contingency plan as required in paragraph (K)(6) of this rule.

(5) The owner or operator shall treat and dispose of collected leachate in accordance with one of the following:

(a) Treat and dispose of collected leachate on site at the residual solid waste landfill facility.

(b) Pretreat collected leachate on-site and dispose of collected leachate off-site of the residual solid waste landfill facility.

(c) Treat and dispose of collected leachate off-site of the residual solid waste landfill facility.

(6) The owner or operator shall prepare a contingency plan for the storage and disposal of leachate. The plan shall describe the immediate and long term steps, including the setting aside of land for the construction and operation of an on-site treatment facility, to be taken for leachate management in the event that collected leachate cannot be managed in accordance with the management option selected in paragraph (K)(5) of this rule.

(7) If a substantial threat of water pollution exists from the leachate entering surface waters, the health commissioner or the director may require the owner or operator to monitor the surface water.

(L) [Reserved.]

(M) Annual operational report.

The owner or operator of a residual solid waste landfill facility shall submit an

*** DRAFT - NOT YET FILED ***

"annual operational report" to the appropriate Ohio EPA district office and approved health department not later than the first day of April of each year. The "annual operational report" shall include, at a minimum, the following information summarizing the previous calendar year's operations:

(1) A topographic map of the residual solid waste landfill facility, certified by a professional skilled in the appropriate discipline(s), with updated contour lines on the plan drawing containing information specified in rule 3745-30-05 of the Administrative Code. The scale and contour interval shall be consistent with the approved plans. At a minimum, the owner or operator shall identify the following:

(a) The calendar year which the submittal represents.

(b) The areal extent of each phase of construction.

(c) The areal extent of closed areas that have a final cap system.

(d) Areas that have intermediate cover.

(e) The current working phase.

(f) The projected phase(s) for filling in the coming year.

(g) Access roads and buildings.

(h) On-site borrow areas and cover material stockpiles.

(i) A comparison of the actual vertical and horizontal limits of emplaced waste to the vertical and horizontal limits of waste placement authorized in the applicable authorizing document(s), including an approved permit(s) to install, plan approval, or operational report. If emplaced waste exceeds the limits of vertical and horizontal waste placement authorized in the applicable authorizing document(s), this comparison shall include a topographic map which delineates the areal extent of emplaced waste that exceeds approved limits specified in such authorizing documents. In addition, the topographic map shall contain notes that indicate the following information for waste exceeding authorized limits of waste placement: the maximum estimated volume, the maximum depth, and the average depth.

*** DRAFT - NOT YET FILED ***

[Comment: The submittal of this information does not relieve an owner or operator from complying with applicable authorizing documents or correcting violations.]

(2) An estimate of the remaining residual solid waste landfill facility life, in years, and in terms of the remaining volume of the residual solid waste landfill facility to be filled, in cubic yards.

(3) A summary of the quantity of leachate collected for treatment and disposal on a monthly basis during the year, location of leachate treatment and/or disposal, and verification that the leachate management system is operating in accordance with this rule.

(4) Results from analytical testing for a minimum of one leachate grab sample for the parameters specified in rule 3745-30-03 and in appendix III of rule 3745-30-08 of the Administrative Code. The grab sample shall be obtained from the leachate management system according to the test methods specified in rule 3745-30-03 of the Administrative Code. Based on these results, the director may require additional leachate sampling and testing in accordance with rule 3745-30-03 of the Administrative Code to re-evaluate the landfill classification.

(5) A report detailing the results of tests required by rule 3745-30-03 of the Administrative Code.

(6) The most recent final closure cost estimate and post-closure care cost estimate which have been revised in accordance with paragraph (E)(14)(a) of this rule.

(7) A summary of any maintenance performed on the leachate management system, ground water monitoring system, explosive gas monitoring system, if required, and any other monitoring and control system installed at the residual waste landfill facility or performed in response to paragraphs (J) and (K) of this rule.

(8) The results of the annual evaluation of ground water surface elevation data in accordance with rule 3745-30-08 of the Administrative Code.

(9) A notarized statement that, to the best of the knowledge of the owner or operator, the information contained in the annual report is true and accurate.

(N) Ten-year design demonstration.

*** DRAFT - NOT YET FILED ***

Upon every tenth anniversary of the effective date of the initial permit to install issued to the owner or operator of the residual solid waste landfill facility pursuant to Chapter 3734. of the Revised Code and each tenth anniversary thereafter, the owner or operator shall submit to Ohio EPA an analysis demonstrating that the unconstructed portions of the residual solid waste landfill facility continue to be consistent with the design standards established in the current version of rule 3745-30-07 of the Administrative Code. If the director determines that the design is no longer consistent with the standards established in the current version of rule 3745-30-07 of the Administrative Code, then the director may require the owner or operator to make the necessary changes to the residual solid waste landfill facility to bring the facility into compliance with the design standards in the current version of rule 3745-30-07 of the Administrative Code. Since these changes will represent deviations from what is contained in the current authorizing document(s), the owner or operator shall obtain the appropriate authorization from the director prior to making the changes. If a permit to install application is required, the director shall not apply the siting criteria outlined in paragraph (B) of rule 3745-30-06 of the Administrative Code, when considering the permit to install application.

[Comment: A deviation may be an alteration, a modification, or an other change depending upon the significance of the deviation. If the deviation represents an alteration, then the owner or operator is required to obtain written concurrence from Ohio EPA prior to making any change to the facility. If the deviation represents a modification, then the owner or operator is required to obtain a permit to install for the modification from Ohio EPA prior to making any change to the facility.]

[Comment: To determine when Ohio EPA does and does not apply siting criteria to the review of an application for a permit to install to modify the facility, see rule 3745-30-06 of the Administrative Code.]

*** DRAFT - NOT YET FILED ***

3745-30-15 **Variances.**

(A) Any person may request, in writing to the director, a variance of any provision of rules 3745-27-15, 3745-27-16, 3745-27-17, 3745-27-18, 3745-30-01, 3745-30-02, 3745-30-03, 3745-30-04, 3745-30-05, 3745-30-06, 3745-30-07, 3745-30-08, 3745-30-09, 3745-30-10, and 3745-30-14 of the Administrative Code. A request for a variance shall identify the provision(s) of the regulations for which the variance is requested and shall contain information regarding the reason and justification for the variance, and any other pertinent data regarding the request as the director may require for the demonstration specified in paragraph (D) of this rule.

(B) If the director or his authorized representative determines that a request for a variance is incomplete, the applicant shall be notified, within sixty days, of the nature of any deficiency and of the director's refusal to consider the request until the deficiency is rectified and the request completed.

(C) The director shall grant a variance only if the applicant demonstrates to the director's satisfaction that construction and/or operation and/or closure activities and/or post-closure activities of the residual waste facility in the manner approved by the variance and any terms or conditions imposed as part of the variance will not create a nuisance or a health hazard and is unlikely to result in a violation of any regulation adopted by the director pursuant to Chapters 3704. and 6111. of the Revised Code.

(D) In granting a variance, the director shall identify the provision(s) of the regulations for which the variance is granted, and shall also state any terms and conditions imposed upon the applicant, and may also, if appropriate, specify the time period for which the variance is granted.

(E) If a variance is requested as part of a permit to install application, the director shall issue a final or proposed action to grant or deny the variance concurrent to the final or proposed action to approve or deny the permit to install application. If a variance is requested, but not as part of a permit to install application, the director shall issue a final or proposed action to grant or deny the variance within ninety days of the date on which a complete request is received.