**Section 811.319 Groundwater Monitoring Programs**

a) Detection Monitoring Program. Any use of the term maximum allowable predicted concentration in this Section is a reference to Section 811.318(c). The operator must implement a detection monitoring program in accordance with the following requirements:

1) Monitoring Schedule and Frequency

A) The monitoring period must begin as soon as waste is placed into the unit of a new landfill or before September 18, 1991 for an existing landfill. Monitoring must continue for a minimum period of 15 years after closure, or in the case of MSWLF units, a minimum period of 30 years after closure, except as otherwise provided by subsection (a)(1)(C). The operator must sample all monitoring points for all potential sources of contamination on a quarterly basis except as specified in subsection (a)(3), for a period of five years from the date of issuance of the initial permit for significant modification under 35 Ill. Adm. Code 814.104 or a permit for a new unit under 35 Ill. Adm. Code 813.104. After the initial five-year period, the sampling frequency for each monitoring point must be reduced to a semi-annual basis, provided the operator has submitted the certification described in 35 Ill. Adm. Code 813.304(b). Alternatively, after the initial five-year period, the Agency must allow sampling on a semi-annual basis if the operator demonstrates that monitoring effectiveness has not been compromised, that sufficient quarterly data has been collected to characterize groundwater, and that leachate from the monitored unit does not constitute a threat to groundwater. For the purposes of this Section, the source must be considered a threat to groundwater if the results of the monitoring indicate either that the concentrations of any of the constituents monitored within the zone of attenuation is above the maximum allowable predicted concentration for that constituent or, for existing landfills, subject to Subpart D of 35 Ill. Adm. Code 814, that the concentration of any constituent has exceeded the applicable standard at the compliance boundary as defined in 35 Ill. Adm. Code 814.402(b)(3).

B) Beginning 15 years after closure of the unit, or five years after all other potential sources of discharge no longer constitute a threat to groundwater, as defined in subsection (a)(1)(A), the monitoring frequency may change on a well by well basis to an annual schedule if either of the following conditions exist. However, monitoring must return to a quarterly schedule at any well if a statistically significant increase is determined to have occurred in accordance with Section 811.320(e), in the concentration of any constituent with respect to the previous sample.

i) All constituents monitored within the zone of attenuation have returned to a concentration less than or equal to ten percent of the maximum allowable predicted concentration; or

ii) All constituents monitored within the zone of attenuation are less than or equal to their maximum allowable predicted concentration for eight consecutive quarters.

C) Monitoring must be continued for a minimum period of: 30 years after closure at MSWLF units, except as otherwise provided by subsections (a)(1)(D) and (a)(1)(E); five years after closure at landfills, other than MSWLF units, which are used exclusively for disposing waste generated at the site; or 15 years after closure at all other landfills regulated under this Part. Monitoring, beyond the minimum period, may be discontinued under the following conditions:

i) No statistically significant increase is detected in the concentration of any constituent above that measured and recorded during the immediately preceding scheduled sampling for three consecutive years, after changing to an annual monitoring frequency; or

ii) Immediately after contaminated leachate is no longer generated by the unit.

D) The Agency may reduce the groundwater monitoring period at a MSWLF unit upon a demonstration by the owner or operator that the reduced period is sufficient to protect human health and environment.

E) An owner or operator of a MSWLF unit must petition the Board for an adjusted standard in accordance with Section 811.303, if the owner or operator seeks a reduction of the post-closure care monitoring period for all of the following requirements:

i) Inspection and maintenance (Section 811.111);

ii) Leachate collection (Section 811.309);

iii) Gas monitoring (Section 811.310); and

iv) Groundwater monitoring (Section 811.319).

BOARD NOTE: Changes to subsections (a)(1)(A), (a)(1)(C), (a)(1)(D), and (a)(1)(E) are derived from 40 CFR 258.61.

2) Criteria for Choosing Constituents to be Monitored

A) The operator must monitor each well for constituents that will provide a means for detecting groundwater contamination. Constituents must be chosen for monitoring if they meet the following requirements:

i) The constituent appears in, or is expected to be in, the leachate; and

ii) Is contained within the following list of constituents:

Ammonia nitrogen (dissolved) (CAS No. 7664-41-7)

Arsenic (dissolved) (CAS No. 7440-38-2)

Boron (dissolved) (CAS No. 7440-42-8)

Cadmium (dissolved) (CAS No. 7440-43-9)

Chloride (dissolved) (CAS No. 16887-00-6)

Chromium (dissolved) (CAS No. 7447-47-3)

Cyanide (total) (CAS No. 57-12-5)

Lead (dissolved) (CAS No. 7439-92-1)

Magnesium (dissolved) (CAS No. 7439-95-4)

Mercury (dissolved) (CAS No. 7439-97-6)

Nitrate (dissolved) (CAS No. 14797-55-8)

Sulfate (dissolved) (CAS No. 14808-79-8)

Total dissolved solids (TDS)

Zinc (dissolved) (CAS No. 7440-66-6)

iii) This is the minimum list for MSWLFs.

iv) Any facility accepting more than 50% by volume non-municipal waste must determine additional indicator parameters based upon leachate characteristic and waste content.

B) One or more indicator constituents, representative of the transport processes of constituents in the leachate, may be chosen for monitoring in place of the constituents it represents. The use of such indicator constituents must be included in an Agency approved permit.

3) Organic Chemicals Monitoring. The operator must monitor each existing well that is being used as a part of the monitoring well network at the facility before September 18, 1991, and monitor each new well within the three months after its establishment. The monitoring required by this subsection (a)(3) must be for a broad range of organic chemical contaminants in accordance with the following procedures:

A) The analysis must be at least as comprehensive and sensitive as the tests for the 51 organic chemicals in drinking water described at 40 CFR 141.40 and appendix I of 40 CFR 258, each incorporated by reference at 35 Ill. Adm. Code 810.104 and:

|  |
| --- |
| Acetone (CAS No. 67-64-1) |
| Acrylonitrile (CAS No. 107-13-1) |
| Benzene (CAS No. 71-43-2) |
| Bromobenzene (CAS No. 108-86-1) |
| Bromochloromethane (CAS No. 74-97-5) |
| Bromodichloromethane (CAS No. 75-27-0) |
| Bromoform; tribromomethane (CAS No. 75-25-2) |
| n-Butylbenzene (CAS No. 104-51-8) |
| sec-Butylbenzene (CAS No. 135-98-8) |
| tert-Butylbenzene (CAS No. 98-06-6) |
| Carbon disulfide (CAS No. 75-15-0) |
| Carbon tetrachloride (CAS No. 56-23-5) |
| Chlorobenzene (CAS No. 108-90-7) |
| Chloroethane (CAS No. 75-00-3) |
| Chloroform; trichloromethane (CAS No. 67-66-3) |
| o-Chlorotoluene (CAS No. 95-49-8) |
| p-Chlorotoluene (CAS No. 106-43-4) |
| Dibromochloromethane (CAS No. 124-48-1) |
| 1,2-Dibromo-3-chloropropane (CAS No. 106-43-4) |
| 1,2-Dibromoethane (CAS No. 106-93-4) |
| 1,2-Dichlorobenzene (CAS No. 95-50-1) |
| 1,3-Dichlorobenzene (CAS No. 541-73-1) |
| 1,4-Dichlorobenzene (CAS No. 106-46-7) |
| trans-1,4-Dichloro-2-butene (CAS No. 110-57-6) |
| Dichlorodifluoromethane (CAS No. 75-71-8) |
| 1,1-Dichloroethane (CAS No. 75-34-3) |
| 1,2-Dichloroethane (CAS No. 107-06-2) |
| 1,1-Dichloroethylene (CAS No. 75-35-4) |
| cis-1,2-Dichloroethylene (CAS No. 156-59-2) |
| trans-1,2-Dicloroethylene (CAS No. 156-60-5) |
| 1,2-Dichloropropane (CAS No. 78-87-5) |
| 1,3-Dichloropropane (CAS No. 142-28-9) |
| 2,2-Dichloropropane (CAS No. 594-20-7) |
| 1,1-Dichloropropene (CAS No. 563-58-6) |
| 1,3-Dichloropropene (CAS No. 542-75-6) |
| cis-1,3-Dichloropropene (CAS No. 10061-01-5) |
| trans-1,3-Dichloropropene (CAS No. 10061-02-6) |
| Ethylbenzene (CAS No. 100-41-4) |
| Hexachlorobutadiene (CAS No. 87-68-3) |
| 2-Hexanone; methyl butyl ketone (CAS No. 591-78-6) |
| Isopropylbenzene (CAS No. 98-82-8) |
| p-Isopropyltoluene (CAS No. 99-87-6) |
| Methyl bromide; bromomethane (CAS No. 74-83-9) |
| Methyl chloride; chloromethane (CAS No. 74-87-3) |
| Methylene bromide; dibromomethane (CAS No. 74-95-3) |
| Dichloromethane (CAS No. 75-09-2) |
| Methyl ethyl ketone (CAS No. 78-93-3) |
| Methyl iodide; iodomethane (CAS No. 74-88-4) |
| 4-Methyl-2-pentanone (CAS No. 108-10-1) |
| Naphthalene (CAS No. 91-20-3) |
| Oil and Grease (hexane soluble) |
| n-Propylbenzene (CAS No. 103-65-1) |
| Styrene (CAS No. 100-42-5) |
| 1,1,1,2-Tetrachloroethane (CAS No. 630-20-6) |
| 1,1,2,2-Tetrachloroethane (CAS No. 79-34-5) |
| Tetrachloroethylene (CAS No. 127-18-4) |
| Tetrahydrofuran (CAS No. 109-99-9) |
| Toluene (CAS No. 108-88-3-23-8) |
| Total Phenolics |
| 1,2,3-Trichlorobenzene |
| 1,2,4-Trichlorobenzene (CAS No. 120-82-1) |
| 1,1,1-Trichloroethane (CAS No. 71-55-6) |
| 1,1,2-Trichloroethane (CAS No. 79-00-5) |
| Trichloroethylene (CAS No. 79-01-6) |
| Trichlorofluoromethane (CAS No. 75-69-4) |
| 1,2,3-Trichloropropane (CAS No. 96-18-4) |
| 1,2,4-Trimethylbenzene (CAS No. 526-73-8) |
| 1,3,5-Trimethylbenzene (CAS No. 108-67-8) |
| Vinyl acetate (CAS No. 108-05-4) |
| Vinyl chloride (CAS No. 75-01-4) |
| Xylenes (CAS No. 1330-20-7) |

B) At least once every two years, the operator must monitor each well in accordance with subsection (a)(3)(A).

C) The operator of a MSWLF unit must monitor each well in accordance with subsection (a)(3)(A) on a semi-annual basis.

BOARD NOTE: Subsection (a)(3)(C) is derived from 40 CFR 258.54(b).

4) Confirmation of Monitored Increase

A) The confirmation procedures of this subsection must be used only if the concentrations of the constituents monitored can be measured at or above the practical quantitation limit (PQL). The PQL is defined as the lowest concentration that can be reliably measured within specified limits of precision and accuracy, under routine laboratory operating conditions. The operator must institute the confirmation procedures of subsection (a)(4)(B) after notifying the Agency in writing, within 10 days, of observed increases:

i) The concentration of any inorganic constituent monitored in accordance with subsections (a)(1) and (a)(2) shows a progressive increase over eight consecutive monitoring events;

ii) The concentration of any constituent exceeds the maximum allowable predicted concentration at an established monitoring point within the zone of attenuation;

iii) The concentration of any constituent monitored in accordance with subsection (a)(3) exceeds the preceding measured concentration at any established monitoring point; and

iv) The concentration of any constituent monitored at or beyond the zone of attenuation exceeds the applicable groundwater quality standards of Section 811.320.

B) The confirmation procedures must include the following:

i) The operator must verify any observed increase by taking additional samples within 90 days after the initial sampling event and ensure that the samples and sampling protocol used will detect any statistically significant increase in the concentration of the suspect constituent in accordance with Section 811.320(e), so as to confirm the observed increase. The operator must notify the Agency of any confirmed increase before the end of the next business day following the confirmation.

ii) The operator must determine the source of any confirmed increase, which may include, but must not be limited to, natural phenomena, sampling or analysis errors, or an offsite source.

iii) The operator must notify the Agency in writing of any confirmed increase. The notification must demonstrate a source other than the facility and provide the rationale used in such a determination. The notification must be submitted to the Agency no later than 180 days after the original sampling event. If the facility is permitted by the Agency, the notification must be filed for review as a significant permit modification under Subpart B of 35 Ill. Adm. Code 813.

iv) If an alternative source demonstration described in subsections (a)(4)(B)(ii) and (a)(4)(B)(iii) cannot be made, assessment monitoring is required in accordance with subsection (b).

v) If an alternative source demonstration, submitted to the Agency as an application, is denied under 35 Ill. Adm. Code 813.105, the operator must commence sampling for the constituents listed in subsection (b)(5), and submit an assessment monitoring plan as a significant permit modification, both within 30 days after the dated notification of Agency denial. The operator must sample the well or wells that exhibited the confirmed increase.

b) Assessment Monitoring. The operator must begin an assessment monitoring program in order to confirm that the solid waste disposal facility is the source of the contamination and to provide information needed to carry out a groundwater impact assessment in accordance with subsection (c). The assessment monitoring program must be conducted in accordance with the following requirements:

1) The assessment monitoring must be conducted in accordance with this subsection to collect information to assess the nature and extent of groundwater contamination. The owner or operator of a MSWLF unit must comply with the additional requirements prescribed in subsection (b)(5). The assessment monitoring must consist of monitoring of additional constituents that might indicate the source and extent of contamination. In addition, assessment monitoring may include any other investigative techniques that will assist in determining the source, nature and extent of the contamination, which may consist of, but need not be limited to the following:

A) More frequent sampling of the wells in which the observation occurred;

B) More frequent sampling of any surrounding wells; and

C) The placement of additional monitoring wells to determine the source and extent of the contamination.

2) Except as provided for in subsections (a)(4)(B)(iii) and (a)(4)(B)(v), the operator of the facility for which assessment monitoring is required must file the plans for an assessment monitoring program with the Agency. If the facility is permitted by the Agency, then the plans must be filed for review as a significant permit modification under Subpart B of 35 Ill. Adm. Code 813 within 180 days after the original sampling event. The assessment monitoring program must be implemented within 180 days after the original sampling event in accordance with subsection (a)(4) or, in the case of permitted facilities, within 45 days after Agency approval.

3) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents, monitored at or beyond the zone of attenuation is above the applicable groundwater quality standards of Section 811.320 and is attributable to the solid waste disposal facility, then the operator must determine the nature and extent of the groundwater contamination including an assessment of the potential impact on the groundwater should waste continue to be accepted at the facility and must implement the remedial action in accordance with subsection (d).

4) If the analysis of the assessment monitoring data shows that the concentration of one or more constituents is attributable to the solid waste disposal facility and exceeds the maximum allowable predicted concentration within the zone of attenuation, then the operator must conduct a groundwater impact assessment in accordance with the requirements of subsection (c).

5) In addition to the requirements of subsection (b)(1), to collect information to assess the nature and extent of groundwater contamination, the following requirements are applicable to MSWLF units:

A) The monitoring of additional constituents under subsection (b)(1) must include, at a minimum (except as otherwise provided in subsection (b)(5)(E)), the constituents listed in appendix II of 40 CFR 258, incorporated by reference at 35 Ill. Adm. Code 810.104, and constituents from 35 Ill. Adm. Code 620.410.

BOARD NOTE: Subsection (b)(5)(A) is derived from 40 CFR 258.55(b).

B) Within 14 days after obtaining the results of sampling required under subsection (b)(5)(A), the owner or operator must do as follows:

i) The owner or operator must place a notice in the operating record identifying the constituents that have been detected; and

ii) The owner or operator must notify the Agency that such a notice has been placed in the operating record.

BOARD NOTE: Subsection (b)(5)(B) is derived from 40 CFR 258.55(d)(1).

C) The owner or operator must establish background concentrations for any constituents detected under subsection (b)(5)(A) in accordance with Section 811.320(e).

BOARD NOTE: Subsection (b)(5)(C) is derived from 40 CFR 258.55(d)(3).

D) Within 90 days after the initial monitoring in accordance with subsection (b)(5)(A), the owner or operator must monitor for the detected constituents listed in appendix II of 40 CFR 258, incorporated by reference in 35 Ill. Adm. Code 810.104, and 35 Ill. Adm. Code 620.410 on a semiannual basis during the assessment monitoring. The operator must monitor all the constituents listed in appendix II of 40 CFR 258 and 35 Ill. Adm. Code 620.410 on an annual basis during assessment monitoring.

BOARD NOTE: Subsection (b)(5)(D) is derived from 40 CFR 258.55(d)(2).

E) The owner or operator may request the Agency to delete any of the 40 CFR 258 and 35 Ill. Adm. Code 620.410 constituents by demonstrating to the Agency that the deleted constituents are not reasonably expected to be in or derived from the waste contained in the leachate.

BOARD NOTE: Subsection (b)(5)(E) is derived from 40 CFR 258.55(b).

F) Within 14 days after finding an exceedance above the applicable groundwater quality standards in accordance with subsection (b)(3), the owner or operator must do as follows:

i) The owner or operator must place a notice in the operating record that identifies the constituents monitored under subsection (b)(1)(D) that have exceeded the groundwater quality standard;

ii) The owner or operator must notify the Agency and the appropriate officials of the local municipality or county within whose boundaries the site is located that such a notice has been placed in the operating record; and

iii) The owner or operator must notify all persons who own land or reside on land that directly overlies any part of the plume of contamination if contaminants have migrated off-site.

BOARD NOTE: Subsection (b)(5)(F) is derived from 40 CFR 258.55(g)(1)(i) through (g)(1)(iii).

G) If the concentrations of all constituents in appendix II of 40 CFR 258, incorporated by reference in 35 Ill. Adm. Code 810.104, and 35 Ill. Adm. Code 620.410 are shown to be at or below background values, using the statistical procedures in Section 811.320(e), for two consecutive sampling events, the owner or operator must notify the Agency of this finding and may stop monitoring the appendix II of 40 CFR 258 and 35 Ill. Adm. Code 620.410 constituents.

BOARD NOTE: Subsection (b)(5)(G) is derived from 40 CFR 258.55(e).

c) Assessment of Potential Groundwater Impact. An operator required to conduct a groundwater impact assessment in accordance with subsection (b)(4) must assess the potential impacts outside the zone of attenuation that may result from confirmed increases above the maximum allowable predicted concentration within the zone of attenuation, attributable to the facility, in order to determine if there is need for remedial action. In addition to the requirements of Section 811.317, the following requirements apply:

1) The operator must utilize any new information developed since the initial assessment and information from the detection and assessment monitoring programs and such information may be used for the recalibration of the GCT model; and

2) The operator must submit the groundwater impact assessment and any proposed remedial action plans determined necessary under subsection (d) to the Agency within 180 days after the start of the assessment monitoring program.

d) Remedial Action. The owner or operator of a MSWLF unit must conduct corrective action in accordance with Sections 811.324, 811.325, and 811.326. The owner or operator of a landfill facility, other than a MSWLF unit, must conduct remedial action in accordance with this subsection (d).

1) The operator must submit plans for the remedial action to the Agency. Such plans and all supporting information including data collected during the assessment monitoring must be submitted within 90 days after determination of either of the following:

A) The groundwater impact assessment, performed in accordance with subsection (c), indicates that remedial action is needed; or

B) Any confirmed increase above the applicable groundwater quality standards of Section 811.320 is determined to be attributable to the solid waste disposal facility in accordance with subsection (b).

2) If the facility has been issued a permit by the Agency, then the operator must submit this information as an application for significant modification to the permit;

3) The operator must implement the plan for remedial action program within 90 days after the following:

A) Completion of the groundwater impact assessment that requires remedial action;

B) Establishing that a violation of an applicable groundwater quality standard of Section 811.320 is attributable to the solid waste disposal facility in accordance with subsection (b)(3); or

C) Agency approval of the remedial action plan, if the facility has been permitted by the Agency.

4) The remedial action program must consist of one or a combination of one of more of the following solutions:

A) Retrofit additional groundwater protective measures within the unit;

B) Construct an additional hydraulic barrier, such as a cutoff wall or slurry wall system;

C) Pump and treat the contaminated groundwater; or

D) Any other equivalent technique that will prevent further contamination of groundwater.

5) Termination of the Remedial Action Program

A) The remedial action program must continue in accordance with the plan until monitoring shows that the concentrations of all monitored constituents are below the maximum allowable predicted concentration within the zone of attenuation, below the applicable groundwater quality standards of Section 811.320 at or beyond the zone of attenuation, over a period of four consecutive quarters no longer exist.

B) The operator must submit to the Agency all information collected under subsection (d)(5)(A). If the facility is permitted, then the operator must submit this information as a significant modification of the permit.

(Source: Amended at 44 Ill. Reg. 15577, effective September 3, 2020)