**Section 817.415 Groundwater Monitoring Programs**

a) Detection monitoring program:

Any use of the term "maximum allowable predicted concentration" or "MAPC" in this Section is a reference to Section 817.414(c), as defined in Section 811.102. The operator shall implement a detection monitoring program in accordance with the following requirements:

1) Monitoring schedule and frequency:

A) The monitoring period shall begin as soon as waste is placed into the unit of a new landfill or within one year after August 1, 1994 for an existing landfill. Monitoring shall continue for a minimum period of five years after closure or, in the case of landfills, other than those used exclusively for disposing waste generated at the site, a minimum of fifteen years after closure. The operator shall sample all monitoring points for all potential sources of contamination on a quarterly basis except as specified in subsection (a)(3) of this Section or may institute more frequent sampling throughout the time the source constitutes a threat to groundwater. For the purposes of this Section, the source shall be considered a threat to groundwater if the results of the monitoring indicate that the concentrations of any of the constituent monitored within the zone of attenuation are above the MAPC for that constituent.

B) Beginning five 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) of this Section, the monitoring frequency may change on a well by well basis to an annual schedule if either of the conditions listed in subsection (a)(1)(B)(i) or (a)(1)(B)(ii) of this Section exist. However, monitoring shall return to a quarterly schedule at any well where a statistically significant increase is determined to have occurred in accordance with Section 817.416(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 MAPC; or

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

C) Monitoring shall be continued for a minimum period of five years after closure or, in the case of landfills, other than those used exclusively for disposing waste generated at the site, a minimum period of fifteen years after closure. 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.

2) Criteria for choosing constituents to be monitored:

A) The operator shall monitor each well for constituents that will provide a means for detecting groundwater contamination. Constituents shall 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) The Board has established a groundwater quality standard at 35 Ill. Adm. Code 620, or the constituent may otherwise cause or contribute to groundwater contamination.

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:

A) The operator shall monitor each existing well that is being used as part of the monitoring well network at the facility within one year after August 1, 1994, and monitor each new well within three months after its establishment. The monitoring required by this subsection shall be for the organic chemicals listed in Section 817.Appendix A of this Part. The analysis shall be at least as sensitive as the procedures provided at 40 CFR 141.40 (1992), incorporated by reference at 35 Ill. Adm. Code 810.104.

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

4) Confirmation of monitored increase:

A) The confirmation procedures of this Section shall 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 shall institute the confirmation procedures of subsection (a)(4)(B) after notifying the Agency in writing, within 10 days, of the following observed increases:

i) The concentration of any constituent monitored in accordance with subsections (a)(1) and (a)(2) of this Section shows a progressive increase over four consecutive quarters;

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

iii) The concentration of any constituent monitored in accordance with subsection (a)(3) of this Section 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 817.416.

B) The confirmation procedures shall include the following:

i) The operator shall verify any observed increase by taking additional samples within 45 days after the initial observation 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 35 Ill. Adm. Code 811.320(e), so as to confirm the observed increase. The operator shall notify the Agency of any confirmed increase before the end of the next business day following the confirmation. The verification procedure shall be completed within 90 days after the initial sampling event.

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

iii) The operator shall notify the Agency in writing of any confirmed increase and state the source of the confirmed increase and provide the rationale used in such a determination within ten days after the determination.

b) Assessment monitoring. The operator shall begin an assessment monitoring program in order to confirm the source of the contamination and to provide information needed to carry out a groundwater impact assessment in accordance with subsection (c) of this Section. The assessment monitoring program shall be conducted in accordance with the following requirements:

1) The assessment monitoring shall be conducted to collect information to assess the nature and extent of groundwater contamination, which shall consist of, but not be limited to, the following steps:

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

B) More frequent sampling of any surrounding wells;

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

D) Monitoring of additional constituents to determine the source and extent of contamination; and

E) Any other investigative techniques that will assist in determining the nature and extent of the contamination.

2) The operator of the facility for which assessment monitoring is required shall file the plans for an assessment monitoring program with the Agency. If the facility is permitted by the Agency, then the plans shall be filed for review as a significant permit modification pursuant to 35 Ill. Adm. Code 813.Subpart B. The assessment monitoring program shall be implemented within 90 days after confirmation of any monitored increase in accordance with subsection (a)(4) of this Section or, in the case of permitted facilities, within 90 days after the Agency approval. The assessment monitoring program shall be filed with the Agency within 20 days after an observed increase, as defined in Section 817.415(a)(4)(B)(iii).

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 817.416 and is attributable to the solid waste disposal facility, the operator shall determine the nature and extent of the groundwater contamination, including an assessment of the continued impact on the groundwater should additional waste continue to be accepted at the facility, and shall implement remedial action in accordance with subsection (d) of this Section.

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 MAPC within the zone of attenuation, then the operator shall conduct a groundwater impact assessment in accordance with the requirements of subsection (c) of this Section.

c) Assessment of potential groundwater impact. An operator required to conduct a groundwater impact assessment in accordance with subsection (b)(4) of this Section shall assess the potential impacts outside the zone of attenuation that may result from confirmed increases above the MAPC within the zone of attenuation, attributable to the facility, in order to determine if there is need for remedial action.

1) The operator shall utilize any new information developed since the initial assessment and information from the detection and assessment monitoring programs and such information shall be used to develop a groundwater contaminant transport (GCT) model in accordance with 35 Ill. Adm. Code 811.317(c); and

2) The operator shall submit the groundwater impact assessment, GCT modeling and results, and any proposed remedial action plans determined necessary pursuant to subsection (d) to the Agency within 180 days after the start of the assessment monitoring program.

d) Remedial action:

1) The operator shall submit plans for the remedial action to the Agency. Such plans and all supporting information including data collected during the assessment monitoring shall be submitted within 90 days after determination after 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 817.416 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 shall submit this information as an application for significant modification to the permit.

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

A) Completion of the groundwater impact assessment under subsection (c) that requires remedial action;

B) Establishing that a violation of an applicable groundwater quality standard of Section 817.416 is attributable to the solid waste disposal facility in accordance with subsection (b)(3) above; or

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

4) The remedial action program shall consist of one or a combination of the following solutions to meet the requirements of subsection (d)(5) of this Section in a timely and appropriate manner:

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 Agency approved equivalent technique which will prevent further contamination of groundwater.

5) Termination of the remedial action program:

A) The remedial action program shall continue in accordance with the plan until monitoring shows that the concentrations of all monitored constituents are below the MAPC within the zone of attenuation, and below the applicable groundwater quality standards of Section 817.416 at or beyond the zone of attenuation, over a period of 4 consecutive quarters.

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