

Memorandum

Florida Department of Environmental Protection

TO: Bureau of Petroleum Storage Systems Site Managers
Contracted Local Cleanup Program Site Managers
Interested Parties

THROUGH: Michael E. Ashey, Chief
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SUBJECT: Supplement to Milestone Policy – “Time to Switch” Evaluation Procedure

This guidance memorandum is supplemental to the Preapproval Program Milestone Procedures document dated April 19, 1999. That policy specifies requirements for cleanup milestone goals to be established for all active remediation sites in the preapproval program for which remediation is expected to last longer than one year. If annual milestone cleanup objectives are not achieved a detailed explanation of recommendations for corrective action must be included in the annual O&M report.

At some point in the course of many remediation projects the original system as designed reaches diminishing returns of effectiveness and must be modified, enhanced, or replaced with an alternative strategy for completing the site cleanup efficiently. The purpose of the milestone policy is to ensure that such modification or replacement happens at the appropriate time. One of the alternatives that should be considered for such systems is to switch from active remedial action to natural attenuation monitoring. The FDEP has seen inconsistency in the evaluation of switching the remediation strategy to monitoring of natural attenuation as a viable cleanup method for site rehabilitation completion. The purpose of this guidance is to clarify the evaluation procedure to consider discontinuation of active remedial action and initiation of natural attenuation monitoring for situations in which cleanup milestone goals are not achieved.

This memorandum focuses specifically on procedures to evaluate the viability of natural attenuation monitoring as an alternative to continuing to operate an existing system. Other alternatives such as modifying the existing system, replacing the existing system, or performing an excavation of source material are equally important for consideration and this memorandum's focus on natural attenuation is not intended to diminish the importance of considering those other alternatives. However, natural attenuation should be appropriately considered in addition to those other alternatives. The following considerations should be given to the annual report evaluation of natural attenuation when milestones are not achieved.

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- 1.) The Natural Attenuation Default Concentrations (NADCs) in Chapter 62-777, Florida Administrative Code (F.A.C.), should not be used as an exclusive reason to reject natural attenuation monitoring as a possible remediation strategy to complete the cleanup. The NADCs were created as a rule of thumb procedure to simplify the technical evaluation to justify natural attenuation monitoring as a viable strategy at the conclusion of the site assessment. Once a system has been operating at a site, the NADCs alone should not be used to either recommend or dismiss natural attenuation monitoring as a viable strategy to replace active remediation.
- 2.) When a remediation system has reached diminishing returns of effectiveness in achieving cleanup objectives, the existence of localized residual source mass which might be strategically removed by excavation needs to be considered. Supplemental assessment to identify residual source mass and a proposal to remove it should be considered regardless of whether the subsequent recommendation to complete the cleanup will be to continue with active remedial action or to initiate natural attenuation monitoring.
- 3.) Projected natural attenuation monitoring periods should not be limited to five years or less to be considered a reasonable and a viable alternative. Projected monitoring periods of up to 10 years and longer are acceptable if it is demonstrated to be less costly than continuing active remedial action for the projected time it will take to achieve cleanup target levels.
- 4.) When considering a natural attenuation monitoring strategy which will last for more than two years it should be assumed that the frequency of monitoring would be less often than quarterly. There will be slight variations in the monitoring details and costs on a site-specific basis if and when a natural attenuation monitoring program is actually implemented. However, in the interest of simplicity and uniformity of evaluations in the annual O&M report, in considering the viability of natural attenuation monitoring as an alternative strategy to continuing active remedial action to complete the site cleanup the following cost assumptions should be made as to the annual cost of natural attenuation monitoring. These cost estimates are based on preapproval program template rates and assume that three wells will be monitored for BETX+MTBE or BETX+MTBE and PAHs quarterly for the first two years, semiannually for the next three years, and then annually for the next five years:

	Gasoline only	Diesel/mixed
- years one and two	\$8,600/year	\$10,200/year
- years three through five	\$4,600/year	\$5,400/year
- years six through ten (and beyond)	\$2,450/year	\$2,850/year

- 5.) There are more complexities to the consideration of natural attenuation than presented in this memorandum. This memorandum has not gone into those details because they appear in another FDEP publication, BPSS-11, Natural Attenuation Evaluation

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Procedures. A more detailed examination of the viability of natural attenuation in accordance with BPSS-11 may be appropriate before actually beginning natural attenuation as a replacement for active remedial action. However, the procedures of this memorandum may be used to identify a situation in which it appears feasible to switch from active remedial action to natural attenuation monitoring which could be used to justify a separate report with a more detailed evaluation (Level 2 Natural Attenuation Plan) in accordance with BPSS-11 and a specific monitoring recommendation.

- 6.) The timeframe for how long it will take to achieve cleanup target levels by natural attenuation monitoring may be difficult to predict, particularly if there are no previous monitoring data without the remediation system running to use for concentration reduction trend predictions. At best it may be possible to speculate as to a target range of years it might take to achieve cleanup target levels by natural attenuation. If there are no other viable alternatives to continuing operating the existing system or implementing natural attenuation monitoring, the following method may be used to determine the cost-effectiveness of natural attenuation monitoring in lieu of predicting a specific number of years duration of monitoring in the O&M annual report. A cost should be determined for continuing active remedial action based on the predicted number of years to achieve cleanup target levels from trends in monitoring well reductions while the system has been operating and the historical annual cost of O&M work orders. The cost data listed above for the annual cost of natural attenuation monitoring should be used to determine how many years natural attenuation monitoring could be conducted before exceeding the cost of continuing to operate the existing system to achieve cleanup target levels. If the resultant number of years is significantly greater than the target range for which it is speculated that natural attenuation would take to achieve cleanup target levels, natural attenuation should be given further consideration for completing the site cleanup. If this analysis method is used in the annual O&M report to identify natural attenuation monitoring as a possible viable alternative to continuing with system operation, a work order proposal for a Level 2 Natural Attenuation Plan should be submitted to the FDEP to perform a more detailed evaluation of natural attenuation.
- 7.) The remediation system should generally remain on-site and operational for the first year of monitoring of natural attenuation in case unexpected high rebounds in contaminant concentrations in monitoring wells result in a determination that active remedial action should resume.
- 8.) Once active remedial action is performed at a site, natural attenuation monitoring (like post active remediation monitoring) must be performed for a minimum of four quarters, even if applicable cleanup target levels are met for two consecutive quarters.