Clarification of Postclosure Care Terminology (3-26-14)
by Carl E. Burkhead

The purpose of this document is to clarify various terms and their relationship to each other as they relate to postclosure care (PCC) for closed individual units (or phases) or for a closed landfill itself.

Definition of Terms

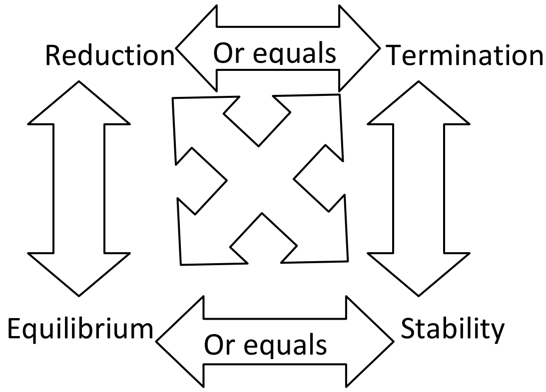
1. **Reduction** – This term has to do with the possibility of **reducing and/or terminating** some of the requirements of State regulations concerning the various activities related to postclosure care (PCC). It recognizes that monitoring data and/or other evidence will serve as the basis for the reduction and/or termination. However, these efforts do not reduce the 30 year PCC requirement for maintenance of the final cover and monitoring requirements for leachate and landfill gas (LFG) collection and disposal, or groundwater monitoring. Accordingly, financial assurance (FA) requirements may be reduced when there is a reduction and/or termination of PCC activities.

2. **Termination** – This term has to do with the end of a PCC activity or the end of PCC with the beginning of custodial care. Custodial care will normally involve minimal monitoring and maintenance activities which are necessary to protect human health, safety or the environment (HHSE) in perpetuity. The landfill owner/operator (O/O) who, or the entity which, is responsible for the site must ensure, with BWM approval, that such protection is provided. FA requirements are for maintenance of these activities and to provide funds for any future corrective action.

3. **Equilibrium** – This is term used to describe the state of MSW which results in relatively uniform amounts of leachate and/or LFG production (This refers to mass flow amounts as opposed to concentration values.) as well as groundwater quality. It is reached by controlling the outside forces affecting the stored MSW such as liquid inputs and final cover design. It does not indicate that the stored MSW is stable; hence, if outside forces are allow to impact the MSW, then the potential for harm to HHSE is greater. However, there is a case where the MSW is stable and equilibrium has been reached; hence, the term equilibrium is synonymous to stability**.**

4. **Stability** – This term refers to the MSW stability in terms of its ability to degrade as a result of outside forces; mainly, moisture, which allows indigenous microbes to process the biodegradable components of the MSW to various end products such as leachate and LFG. Stable MSW results in minimal emissions which are at equilibrium, and which provide a minimal effect on HHSE. In this case stability is synonymous to equilibrium

Combinations – There are six possible combinations of the preceding terms as shown in the following diagram. Their comparisons, which follow, are compared in light of the other two terms (especially when considering the possibility of a trend being established) as follows:



1. **Reduction and Termination** - This combination recognizes that if reduction in activities occurs, then termination could end during PCC for the activities since a trend has been established or after 30 years of PCC because the MSW is at equilibrium and/or stable. The two become equal if the activity is no longer justified by monitoring and/or other evidence.

2. **Reduction and Equilibrium** – This combination recognizes that if equilibrium is reached or a trend is established, then reduction in required activities can occur and termination can also occur for certain activities during PCC or after 30 years even though MSW stability is not achieved. If stability is achieved than reduction and termination are synonymous.

3. **Reduction and Stability** – This combination recognizes that reduction in activities can lead to an equilibrium condition where termination can occur with a stable MSW mass, i.e., the MSW mass is stable and at equilibrium with an established trend. It offers a good recourse for O/O since they can minimize long term HHSE effects and reduce FA requirements.

4. **Termination and Equilibrium** – This combination recognizes that equilibrium can lead to reduction and termination but not without a stable MSW mass. Again, a trend is established.

5. **Termination and Stability** – This combination is the same as No. 4 except the MSW mass is stabilized and offers the best recourse for landfill O/O since they can minimize long term HHSE effects with minimal FA requirements. Again, a trend is established.

6. **Equilibrium and Stability** – This combination recognizes two possibly different MSW states with trends. Equilibrium will allow for reduction of activities and eventually termination even though the waste is not stable. However, the two states can be the same which is the same as Combination 4.

Hypothesized *__Time Effects__* of Combinations for MSW Landfill's Locations, Alternate Final Cover Selections and Liquid Additions - The following table summarizes the ***__expected and relative results__*** for: Kansas landfills located in the arid west versus those in the wet east; the selection of final landfill cover materials (pervious and impervious); and liquid additions. **Note** the importance of landfills taking advantage of liquid additions (e.g., leachate recirculation, the RD&D option and other possibilities) to enhance MSW stability* and the effect of final cover selection to maintain equilibrium.**

Climatic Location of Landfill	Time to Reach Condition Considering: climate, final cover and regular liquid additions. Note the assumptions that a pervious final cover facilitates the addition of intermittent precipitation (less in west versus more in east) and regular liquid additions do not occur when precipitation occurs when the landfill is active.
Arid West (AW)	**Equilibrium** • Fastest with no liquids, impervious cover and no liquid additions.[**] • Slightly slower with pervious cover and no liquid additions. • Even slower with pervious cover and liquid additions.
	Reduction • Same as equilibrium since goal is to reduce an activity.
	Termination • Same as stabilization since goal is to stop an activity.
	Stabilization • Fastest with pervious cover and liquid additions.[*] • Slightly slower with impervious cover and liquid additions. • Absent with impervious cover and no liquid additions.
Wet East	**Equilibrium** • Slower than AW landfill with impervious cover and liquid additions.[**] • Even slower than AW with pervious cover and liquid additions.
	Reduction • Same as AW landfill reduction.
	Termination • Same as AW landfill termination.
	Stabilization • Faster than AW landfill with pervious cover and liquid additions.[*] • Same as AW landfill with impervious cover and liquid additions. • Same as AW landfill with impervious and no liquid additions.