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Redevelopment of Brownfield Properties: Future Property Owners/Users Proceed With Your Eyes Open

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Considerable attention is being given today to the redevelopment of Hazardous chemical sites (brownfield property) as part of the federal and state Superfund program site remediation. Whitman, in an editorial in the Winter 1996 issue of *Environmental Progress* [6], discussed this issue from a PRP short-term perspective in which the tone of the editorial is minimizing costs and rapid remediation. While it is important to minimize unnecessary costs in site remediation relative to and needed for projected future property use, I have found as the result of being involved in a number of brownfield property remediation projects from a future property user perspective, that the short-term, limited remediation approach that is frequently being advocated today carries with it a number of significant potential problems that should be fully understood by the PRP(s) and future property owners/users.

Whitman [6] states in his editorial:

"The key to the success of voluntary cleanup efforts for Brownfield sites is to tie future use *of the property and its surrounding environs to the environmental condition and remedial approaches designed to protect against the* risks of environmental hazards."

He further states:

"Capping urban sites through construction of an impermeable harrier at the surface provides an engineering control approach that is cost effective, environmentally sound and in concert with the future use of the Brownfield property.

It has been my experience that frequently PRP approaches for remediation of hazardous chemical sites are increasingly directed toward "capping" the waste management units-contaminated area.

Lee and Jones-Lee [5] have recently reviewed the potential problems of capping of waste management areas and contaminated soils as a remediation approach for brownfield properties. They point out that RCRA landfill caps:

- can be effective in preventing moisture from entering the landfill or waste management area for short periods of time, such caps as being implemented today are not necessarily effective in preventing groundwater pollution by waste derived constituents for as long as the wastes represent a threat.

- The key to the efficacy of a RCRA cap in preventing groundwater pollution is the maintenance of the low permeability layer within the cap that prevents moisture from entering the wastes and generating leachate.
- The low permeability layer of the cap is buried below a topsoil and drainage layer and therefore not subject to visual inspection for points of deterioration, holes, cracks or other areas where moisture could enter the waste through the cap.
- The introduction of a low permeability cap on a waste management unit makes monitoring of groundwaters for further pollution by the wastes unreliable. The typical groundwater monitoring approach involving vertical monitoring wells spaced hundreds or more feet apart, each with a zone of capture of about one foot can readily fail to detect the finger plumes of leachate that will be generated as a result of moisture entering the wastes through the cap.
- The post-closure care funding for capped "remediated" waste management units is only assured for 30 years. The waste will be a threat forever in many capped waste management units. There is no assurance that the funds needed to monitor, maintain and remediate groundwater pollution from the capped waste management unit will be available. This makes future brownfield property owners vulnerable to future remediation costs.
- The periodic (five year) review of the adequacy of a remediated brownfield property could readily cause brownfield property owners to have to fund additional remediation as a result of changes in the constituents of concern as well as the critical concentrations for previously identified constituents of concern.

While in-place capping of wastes in contaminated areas is one of the least expensive short-term approaches for hazardous chemical site/brownfield remediation, it carries with it potentially significant long-term issues that should and must be addressed in developing a properly remediated site. This issue has been reviewed in detail in several papers/reports (Lee and Jones-Lee, [3,4,5]) and in an ASCE conference proceedings (Dunn and Singh, [1]).

As discussed by Lee and Jones-Lee [5] it is possible, through alternative approaches, to remediate brownfield properties using caps that recognize the inherent long-term problems of today's landfill caps and prepare for their eventual failure. These approaches include the use of leak detectable low permeability layers in the cap and, most importantly, a dedicated trust fund of sufficient magnitude to monitor, operate and maintain the leak detectable cover for as long as the capped waste will be a threat. The magnitude of funding needed should include addressing all plausible worst case scenario failures including waste exhumation.

Additional information on these issues is available from papers and reports listed and made available as downloadable files from the author's Web site (http://members.aol.com/gfredlee/gfl.htm.).

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