Appropriate Monitoring/Evaluation of Stormwater Runoff from Superfund Sites[1]

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It is my experience, having been involved with a number of federal and state "Superfund" sites at various locations across the country, that, typically, inadequate and sometimes unreliable stormwater runoff water quality monitoring/evaluation is being conducted. Many Superfund/hazardous chemical sites have hazardous and otherwise deleterious chemicals in the surface soils of the site which are subject to offsite transport during stormwater runoff events. This situation can lead to significant adverse impacts to the beneficial uses of the receiving waters for the runoff. This problem typically arises from the fact that the academic and professional expertise of the DOE and/or PRP contractors and the regulatory agency personnel is primarily in geological sciences and civil or chemical engineering. However, the appropriate evaluation of the impacts of constituents in stormwater runoff requires considerable understanding of aquatic chemistry, aquatic toxicology, biology and water quality.

I have experienced situations where DOE contractors for an NPL Superfund site developed stormwater runoff so-called water quality monitoring programs in which the program utilized drinking water MCLs as a basis for determining the critical concentrations in stormwater runoff that would be adverse. The DOE contractors and the regulatory agency personnel were not aware of US EPA water quality criteria, much less the fact that, for many potentially toxic constituents, the critical concentrations for protection of aquatic life are far lower than the drinking water MCL for the constituent. Further, and even more significant is the fact that the DOE contractors and the regulatory agency personnel did not understand that the concentrations of chemicals in stormwater runoff that are potentially adverse to human health through aquatic organism bioaccumulation are often many orders of magnitude lower than the critical concentrations (MCLs) for drinking water, as well as the critical concentrations for toxicity to aquatic life.

This failure to understand these fundamental issues leads to situations where the analytical methods used to monitor stormwater runoff from Superfund sites have grossly inadequate detection limits for potentially toxic/bioaccumulatable chemicals compared to those needed to protect aquatic life-related resources and human health through consumption of fish taken from the receiving waters for the stormwater runoff. Contractor reports list the concentrations of constituents in stormwater runoff as less than the detection limit, where the detection limit is well above critical concentrations for protection of aquatic life and human health. These reports state that there are no

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problems associated with the stormwater runoff-associated constituents, since non-detectable concentrations were found. Such a stormwater runoff monitoring program is obviously unreliable and non-protective of public health and the environment.

Lee and Jones-Lee (1998a,b; 1999) have summarized some of the issues that need to be considered in stormwater runoff monitoring from Superfund and other hazardous chemical sites.

References

(The following references are available from www.gfredlee.com.)

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