



Ms. Elizabeth Callahan
Director of Policy & Program Planning
Bureau of Waste Site Cleanup, 6th Floor
One Winter Street
Boston, MA 02108

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RE: NEH Comments on the 2013 Proposed Amendments to the Massachusetts Contingency Plan (MCP)
Submitted via email transmittal

Dear Liz,

Please accept this letter as New Environmental Horizon's (NEH) comments on the public hearing draft of the Proposed Amendments to the MCP, 310 CMR 40.0000. NEH supports the DEP in effective changes to the MCP to streamline the cleanup process and to bring the best science to bear in revising regulations. To this end, we have specific comments on the revisions included in the Risk Assessment and MCP Standards section of the public hearing draft, as follows.

Vanadium

The existing Method 1 soil standard of 600 mg/kg for Vanadium is based on Vanadium Pentoxide toxicity (based on IRIS value). NEH understands that the proposed standard of 30 mg/kg is based on chronic and subchronic toxicity of "vanadium and its soluble inorganic compounds other than vanadium pentoxide," (from April 5, 2013 Method 1 Standards Revisions meeting) and then modified upwards to 30 mg/kg in consideration of background. NEH recommends that either the Method 1 soil standard for Vanadium not change in this revision until further discussion and investigation of the issues presented below, or that DEP re-evaluate soil background levels for Vanadium in MA and set the standard at a more reasonable background level for this metal based on the following.

1. Background Levels of Vanadium in Soil – DEP derived the 30 mg/kg from a small background study from 1995 that included only 30 samples. More current references, including "Chemical Information Review Document for Vanadium and Tetravalent and Pentavalent Forms" (NIH, 2008) and "Toxicological Profile for Vanadium" (US Dept Health & Human Services, ATSDR, 2012), document that Vanadium levels in the US range from <7 to 500 mg/Kg with a 90th percentile at 130 mg/kg and a median of 60 mg/Kg – these levels are significantly higher than the proposed standard. Furthermore, concentrations of Vanadium in Boston Blue Clay are consistently higher than the 30 mg/Kg proposed RCS-1 level (upwards of 50 to 80 mg/Kg). ***Conclusion: The proposed standard of 30 mg/Kg is significantly lower than background levels of Vanadium in soils in MA. Setting such a low standard below background may result in many more sites coming into the MCP due to Vanadium in soil alone (and not be associated with a release).***
2. Forms of Vanadium in the Environment – DEP proposes the more conservative Vanadium standard because they have stated that "there is no basis for assuming that Vanadium is present at sites only in the pentoxide form" (from April 5, 2013 Method 1 Standards Revisions meeting); however,

there is strong evidence to suggest that Vanadium pentoxide is the dominant form of Vanadium in the environment. The NIH 2008 and ATSDR 2012 references cited above indicate that natural releases of Vanadium occur due to weathering of rocks and soil erosion involving the oxidation of V+3 to V+5 (pentavalent) forms and that for anthropogenic sources, ~ 90% of the Vanadium released into the atmosphere (deposition) comes from oil and coal combustion in the form of Vanadium pentoxide (found in fly ash, fuel oils, etc.). Furthermore, the literature suggests that the higher levels of Vanadium found in Northeastern US soils (compared to other parts of the US) is due to anthropogenic sources and that the V+5 oxidation state may be the most prevalent in the environment. **Conclusion: The default assumption that Vanadium in soils in MA is mainly in forms other than Vanadium pentoxide is not supported by the current scientific literature.**

3. Analytical Methods for Vanadium Speciation – Environmental laboratories analyze for Total Vanadium in soils using an acid digestion and then analysis by either ICP-AES (EPA Method 6010) or ICP-MS (EPA Method 6020). Speciation of Vanadium into different forms, including Vanadium pentoxide, requires specialized analyses including: capillary electrophoresis and liquid chromatography (LC), or liquid-liquid extraction or chelation and LC / UV analyses, or X-ray diffraction (XRD), or energy dispersive X-ray fluorescence (EDXRF). None of these methods to analyze specifically for Vanadium pentoxide are commonly performed at environmental laboratories that perform chemical analyses in support of MCP site work. **Conclusion: Speciation of Vanadium to determine if the main form in soil is Vanadium pentoxide is not a currently available analytical method in environmental laboratories that support MCP site work.**

Lead

DEP has proposed two Method 1 standards for lead. The two standards reflect 1) a standard for unconditional site use, which is equal to background (a revised value of 200 mg/Kg) and 2) a higher standard (300 mg/Kg), allowing closure with “conditions.” NEH is concerned that this approach can be confusing to the public and recommends a single standard for unconditional site use of 200 mg/Kg (representing background) be set. We recommend elimination of the dual standard approach for the following reasons.

1. Basis for Dual Standard – Based on the April 5, 2013 public meeting, it appears to us that the 300 mg/Kg standard does not have a scientific basis other than that it is equal to the older standard and that many soils may fall between 200 and 300 mg/Kg.
2. Gardening and BMPs – Specifically for gardening, where the higher 300 mg/Kg standard would require a permanent solution with “conditions,” we understand that Best Management Practices (BMPs) would be recommended. BMPs have not been defined by DEP and though some BMPs are straight-forward recommendations to gardeners, BMPs can vary from source-to-source in the public domain. For example, the UMass Extension Agriculture and Landscape program considers 100 mg/Kg as the soil lead limit, which can be confusing to the general public compared to the Method 1 standards.
3. Communication of “Conditions” – NEH is concerned that the communication to owners of property that has “conditions” may not be easily accessible or adequate to protect public health from potential lead exposure from the gardening pathway.

Hardness-based Criteria for Metals GW-3 Standards

The current public review draft includes proposed GW-3 standards (freshwater criteria) for six metals (cadmium, chromium+3, lead, nickel, silver, and zinc) based on Hardness of 20 mg/L. DEP indicated during the April 5, 2013 meeting that it will be revising the calculation of GW-3 Standards to reflect a Hardness of 25 mg/L. NEH agrees that the impact of these metals on aquatic ecosystems is dependent on

Hardness of the water body; however, we recommend that these GW-3 standards be revised using Hardness of 100 mg/L (consistent with current EPA criteria, see below), with an allowance for site-specific calculations, and that clarification be added that it is the Hardness of the receiving water that will affect the toxicity of the metals. The following points support this recommendation.

1. Current Standards – The current National Recommended Water Quality Criteria values (USEPA, 2013) used for assessment of ecological risk (impact to aquatic environments) for dissolved metals are based on a Hardness of 100 mg/L, but allow for site-specific criteria values to be calculated using different Hardness values. DEP's proposed use of 25 mg/L for Hardness is inconsistent with this EPA guidance (which is supposed to be followed in evaluations of ecological risk).
2. Hardness in Surface Water in MA – For example, the Town of Concord reports water Hardness between 15-90 mg/L while the USGS Map and reference source at: <http://water.usgs.gov/owq/hardness-alkalinity.html#briggs>, shows significantly higher Hardness levels in western MA (~60-120 mg/l) than in eastern MA (~ 0-60 mg/L). The DEP default Hardness of 25 mg/L is low and not necessarily representative of the various surface water bodies across the state.
3. Applicability of the Hardness Value – It is the groundwater discharge to surface water that impacts aquatic environments in the GW-3 scenario of these dissolved metals. Therefore, it is the Hardness of the surface water (receiving water body) that will affect the availability of the dissolved metals. It is important to clarify that Hardness should be measured in the receiving water body for site-specific calculations.

Respectfully submitted,

Susan

Susan D. Chapnick
President & Principal Scientist
New Environmental Horizons, Inc.
2 Farmers Circle
Arlington, MA 02474
Phone: 781-643-4294
Email: s.chapnick@comcast.net