



September 23, 2009

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Bureau of Remediation and Waste Management
Maine Department of Environmental Protection
17 SHS, Augusta, ME 04333-0017

Transmittal via e-mail: david.w.wright@maine.gov

Re: Public comments regarding Maine's 2009 draft risk-based guidance

Dear Mr. Wright:

URS Corporation (URS) would like to provide the following comments from URS' review of the 2009 Maine Department of Environmental Quality (DEP) guidance documents: *Maine Remedial Action Guidelines (MERAGS)*, *Remediation Guidelines for Petroleum Contaminated Site in Maine*, and *Maine DEP Vapor Intrusion Evaluation Guidance*.

Release of three guidance documents across multiple programs - The release of all three documents in the same year and the consistent risk assessment approaches presented within the documents is helpful and promotes consistency across DEP environmental programs.

Use of Maine-specific exposure factors - It appears that DEP has utilized exposure factors more suitable to Maine than those presented in Environmental Protection Agency (EPA) guidance; such as the use of a lower exposure frequency for the outside worker to account for the winter months in Maine when the ground is frozen. This can provide more realistic target levels that are a bit higher than national standards which are, by default, estimated to be protective of areas where the ground is accessible throughout the year. Since this is not the case in Maine, higher target levels are appropriate and protective of Maine residents and workers.

Target levels for volatiles in the construction worker scenario – Although many of the draft target levels are higher than EPA national standards, as would be expected due to the use of Maine-specific exposure factors, some of the target levels are similar or lower than EPA national standards or standards published by other states (see attached table). It appears that, for volatile constituents, DEP used inputs into the Volatilization Factor (VF) equations for volatiles that are more conservative than those used by EPA and other states, which appears to have eliminated or reduced the impact of the Maine-specific exposure factor inputs into the main risk equations for some volatiles.

For example, the use of 0.5 years for (t) (seconds) in the VF equation for the construction worker appears to contribute to the low target values for volatiles in the construction worker scenario. Historically, EPA has used a default of 30 years (9.5×10^8 seconds) or, in some cases, 25 years, assuming a 25-year work history for the construction worker. In practice; EPA does not use exposure-specific "ED"s for "t" in the VF equation. To use 0.5 years appears to



contribute to the lower target levels of volatiles by up to one order of magnitude, with some construction worker levels lower than residential levels.

In implementation of this guidance, these low target levels could impact remedial actions, land values, and the restrictions on properties. It may be warranted to discuss modification of the VF inputs to EPA default values or the removal of built-in uncertainty factors for the construction worker scenario as the draft target levels appear to be overly conservative and, in practice, problematic to remediate to, especially for industrial sites and roads. The standard use of default inputs into the calculation assumes that a construction worker is exposed to volatiles in a confined subsurface environment, which is emitting volatiles consistently, for 8 hours per day, every work day, for a six-month period; therefore, as this is rarely the case, there is enough conservancy without adjustments to the input variables and the use of additional uncertainty factors. The use of established default values in the VF equation would result in target values that both protect the public and reduce the financial and regulatory impacts that the draft target values, as currently published, are likely to cause.

Target levels for arsenic – Due to the uncertainty factors built into the EPA toxicity factors for arsenic, calculated arsenic risk-based target levels tend to be lower than background (which can range up to 20 mg/kg or more in some states). Using calculated values, most land, even parks and pristine areas, would appear to present a risk to humans exposed to those areas. To address this, many states use a background level or range as the target level for arsenic. It is suggested that DEP consider the use of background levels for arsenic in order to avoid unwarranted remediation of arsenic or misperceptions that pristine lands in Maine are impacted and may present a risk to those exposed to those lands, which is certainly not the case.

Target levels for multiple contaminants – It is understood that the “multiple contaminants” target levels assume that five constituents, that all impact the same target organ or present the same adverse effect, are present. This is rarely the case. The majority of sites where similar contaminants (same target organ or adverse effect) would occur are sites impacted with metals or petroleum; however, it would be rare to find five or more constituents at these sites impacting the same target organ or having the same adverse impact.

The other common ‘group’ of contaminants found at sites is polycyclic hydrocarbons (PAHs). For PAHs, the slope factors are based on the more carcinogenic benzo(a)pyrene with other PAHs assigned a ratio of benzo(a)pyrene’s toxicity value, with some PAHs only 1/1,000 of benzo(a)pyrene’s toxicity. With the exception of dibenz(a,h)anthracene, which is rarely present, the total relative potency of the remaining PAHs combined is 40% of benzo(a)pyrene’s toxicity. Therefore, assuming that all of the remaining PAHs were present and impacting the same organs and systems (which they are not), one would need to reduce the target level by 40% instead of the 80% the MERAGS and Petroleum guidance utilize.

To calculate levels that realistically protect for multiple contaminants, the toxicity and endpoints of those contaminants must be considered. It is understood that this is cumbersome for agencies to maintain an up-to-date set of target levels as toxicity information changes over time. This is why most states do not publish target levels for multiple contaminants because to not base them on toxicity would unfairly burden sites with inappropriate target levels, and to base them on toxicity would require frequent changes to the target values. In practice, agencies publish “single contaminant” target values such that an appropriate target level can be derived when multiple contaminants with the same endpoint have been found at a site.



It is suggested that the “multiple contaminants” target levels not be included in the final guidance documents. The use of “single contaminant” target levels, with their built-in uncertainty factors, is sufficient to protect the public, even from multiple contaminants.

Options for multiple contaminants – It is understood that a risk assessment can be conducted when multiple contaminants are present (2-4 constituents present, constituents impacting different target organs, etc.). As risk assessments can be costly and time-consuming, if the use of “multiple contaminants” target levels is retained, then consideration should be given to supplementing the screening process for those cases where less than five constituents with similar toxicity characteristics are present. DEP could accomplish this by allowing the adjustment of the published “single contaminant” target levels when site investigations indicate the presence of less than five carcinogenic constituents and/or less than five noncarcinogenic constituents, as indicated in DEP guidance. The “multiple contaminants” target levels could be adjusted to protect for constituents with similar end points. For example, if sampling indicates two carcinogenic constituents that target the liver, the “single contaminant” level could be reduced by half to be protective. If this were allowed by DEP, remediation of impacted properties and the protection of the public would be expedited. Simple steps to accomplish this could be added to the guidance or published separately to provide a consistent approach to screen those properties with multiple constituents.

We appreciate the Department’s consideration of these comments and welcome the opportunity to discuss this issue if needed.

Sincerely,

A handwritten signature in black ink, appearing to read "Pamela Holley".

Pamela Holley

Senior Project Manager
URS Corporation

Attachment

Comparison of Maine MERAGS Target Levels to Federal and State Levels

Chemical	MERAGS Soil Screening Levels, July 20009								Petroleum Guidance, August 2009						EPA RSL		Massachusetts Contingency Plan, Feb 2008						CT DEP		MO RBCA
	Resident		Commercial		Park User		Construction		Tier 1 Cumulative				App B		Res Soil	Industrial Soil	Method 1			Method 2			DEC		Tier 1 DTLs
	Single	Multiple	Single	Multiple	Single	Multiple	Single	Multiple	Res	Comm	Park User	Const Wkr	S&G	Till			S-1	S-2	S-3	S-1	S-2	S-3	Res	Ind-Comm	
Arsenic	1.4	0.14	4.2	0.42	2.3	0.23	42	4.2							3.9	1.6	20	20	20	20	20	20	10	10	10-14*
Benzene	85	17	745	74	141	28	82	16	17	74	28	16	0.51	14	1.1	5.6	2-30	2-200	2-900	30	200	900	21	200	0.056
Benzo(a)pyrene	0.26	0.026	3.5	0.35	0.4	0.04	43	4.3							0.015	0.21	2	4	30	2	4	30	1	1	0.62
Ethylbenzene	1,163	120	3,157	316	1,939	194	3,610	361	120	320	195	360	2.3	0.81	5.7	29	40-500	40-1000	40-3000	500	1,000	3,000	500	1,000	39.9
Methyl ethyl ketone	100,000	20,000	870,000	170,000	170,000	34,000	38,000	7,500							28,000	190,000	4-400	4-400	4-400	500	1,000	3,000			7.3
Naphthalene	1,100	100	1,100	110	1,800	180	54	11	110	110	180	11	1.9	1.7	4	20	4-500	4-1000	401,859	500	1,000	3,000	1,000	2,500	0.325
Tetrachloroethene	26	2.6	87	9	43.6	4.4	528	53							0.57	2.7	1-30	1-200	1-1000	30	200	1,000	12	110	0.14
Toluene	13,597	2,719	132,795	26,559	22,662	4,532	30,024	6,005	27,000	27,000	4,500	6,000	24	8.1	5,000	46,000	30-500	30-1000	30-3000	500	1,000	3,000	500	1,000	29.8
1,2,4-Trichlorobenzene	1,300	260	3,700	740	2,200	440	44	8.8							87	400	2-500	2-900	2-900	500	900	900	680	2,500	18.7
Trichloroethene	1,015	101.5	2,928	293	1,692	169	3,942	404							2.8	14	0.3-90	0.3-700	0.3-2000	90	700	2,000	56	520	0.14
Xylenes	26,849	5,370	80,330	16,066	44,748	8,950	2,067	413	4,500	16,000	8,900	410	58	26	600	2,600	300-500	400-1000	400-3000	500	1,000	3,000	500	1,000	24.7

Units are mg/kg
 grey shading - Level not available
 green shading - MDEP level is lower than comparable EPA level
 bold - MDEP construction worker level is less than MDEP residential level
 App - Appendix
 Comm - Commercial Land Use (For Petroleum Guidance, it is an outdoor worker)
 Const Wker - Construction Worker
 CT DEP - Connecticut Department of Environmental Protection
 DEC - Connecticut's Direct Exposure Criteria, September 2008 excel sheet
 DTLs - Default Target Levels
 EPA - Environmental Protection Agency
 Ind - Industrial Land Use
 MERAGS - Maine Remedial Action Guidelines
 MO RBCA - Missouri Risk-based Corrective Action
 Multiple - "Multiple Contaminants" Level
 Resident, Res - Residential land use
 RSL - Risk-base Screening Level, April 2009
 S&G - Sand and gravel aquifer
 Single - "Single Contaminant" Level
 Till - Till aquifer
 * MO RBCA allows background level of arsenic to be considered.