Report to the Connecticut Department of Energy and Environmental Protection

on

# The Draft Proposed Program Outline for a Transformed Cleanup Program

## Topic: RSRs Evaluation – Groundwater and NAPL

November 20, 2012

Submitted to Support the Transformation of Connecticut's Cleanup Program

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# Introduction

The Department of Energy and Environmental Protection (DEEP) is working to improve Connecticut's cleanup program through an interactive stakeholder process. As part of the transformation of the statutory and regulatory components of the cleanup program, DEEP solicited volunteers for and formed six transformation workgroups. DEEP asked these workgroups to comment on and make recommendations regarding certain aspects of the transformation, as summarized in the Draft Proposed Program Outline for a Transformed Cleanup Program.

Transformation workgroup #6 was asked to provide DEEP with comments and recommendations regarding the groundwater and non-aqueous phase liquid (NAPL) provisions of the current Remediation Standard Regulations (RSRs). Comments and recommendations in this report are the opinions of the workgroup members. Care was taken to identify areas where consensus was not reached among workgroup members.

# Workgroup Membership

Members of the workgroup included individuals from various stakeholder groups: regulatory agencies, attorneys, consultants, and responsible parties. Workgroup participants are noted below.

**WORKGROUP #6 – RSRs Evaluation – Groundwater and NAPL**

| Participant | Representing |
|---|---|
| Mark Lewis (Co-Lead) | Department of Energy and Environmental Protection |
| Gail Batchelder (Co-Lead) | Loureiro Engineering Associates, Inc. |
| Michele Alabiso | Drake/Warren Equities, Inc. |
| Elizabeth Barton | Day Pitney LLP |
| John Carroll | Fuss & O'Neill |
| Ken Feathers | DEEP |
| Rosemary Gatter-Evarts | DEEP |
| Gary Ginsberg | Department of Public Health |
| Sheri Hardman | Sovereign Consulting |
| Sam Haydock | BL Companies |
| Nelson Walter | AMEC |
| Nancy Mendel | Winnick Ruben Hoffnung Peabody & Mendel, LLC |
| Alfred Smith | Murtha Cullina LLP |
| Herb Woike | Groundwater & Environmental Services, Inc. |

# Workgroup Meetings

Workgroup #6 held meetings on six separate occasions during fall 2012: October 10th (kick-off meeting); October 17th, October 24th; October 31st; November 14th; and November 19th. For each of those meetings, a call-in number was provided for those workgroup members who were unable to attend in person.

# Background

The primary objective of Workgroup #6 was to evaluate the groundwater sections of the RSRs with respect to what is working effectively or what needs to be changed, eliminated, or added. It was conveyed to the workgroup that discussion of default numeric criteria in the RSRs was beyond the workgroup's charge. However, the workgroup strongly agreed that revisions to the RSRs would require re-evaluating the current default numeric criteria to be consistent with the current scientific thought process and input criteria for development of such values.

As an initial step, workgroup participants prepared a list of 25 topics to start the discussion of where critical changes to the RSRs should be made. Specifically, such changes should provide reasonably achievable endpoints for closure of sites within a shortened time-frame but remain protective of human health and the environment. The 25 topics were grouped into four loosely defined categories to facilitate discussion. Workgroup members then ranked each of the 25 topics with respect to importance for improving the ability of the RSRs to work more effectively within a general framework similar to that of the existing RSRs.

The 25 topics identified by the workgroup are noted below, grouped by general category.

Category A – Insufficient Process for Risk-based Exits

- Groundwater monitoring requirements based on very low criteria, especially compliance and post-remediation monitoring
- RSR criteria based on out-dated science
- Current tiered approach (GA, GB) is too limiting and not sufficient
- Recalcitrant plumes – no way to get to closure
- Limitations on risk-based analysis and closure, especially when no pathway and receptors
- Monitored Natural Attenuation (MNA) – if it is working, how much monitoring is required?
- Opinion of "No Significant Risk" as option for Licensed Environmental Professionals (LEPs)

Category B – Limited Flexibility for Compliance with the RSRs

- Requirement for full GW assessment and/or compliance/post-remediation monitoring for shallow releases well above the water table
- Pollutant Mobility Criteria (PMC) impact but no GW impact

- Clarification regarding what is “upgradient”, especially if the regulations become more release-based
- Alternative Surface Water Protection Criteria (SWPC) not allowed for stagnant (lakes, ponds) or tidal water
- Release-based investigation and remediation issues, especially co-mingled plumes
- Too rigid and inflexible – create a Response Action Performance Standard or need more exposure scenarios (GW1, GW2, GW3, etc.)

Category C – LNAPL and Technical Impracticability (TI) Issues

- Definition of NAPL needs to be revisited
- Cost considerations
- Incorporate ITRC science and knowledge of light non-aqueous phase liquid (LNAPL)
- Decouple from federal and define “impracticable”
- NAPL migration issues
- Can existing TI language work with better guidance?
- Cannot close sites with NAPL

Category D – Other

- Secondary pollution caused by primary releases
- Deed restrictions for plumes that stay on-site
- Stringent SWPC for polychlorinated biphenyls (PCBs) and other constituents of concern
- Need for compliance assistance from DEEP
- Consistency with Other Regulations – e.g. ,Water Quality Standards (WQS)

The list above was then prioritized and reduced to an effective ranking of high, medium or low priority to better identify the relative importance of each topic. While some differences were noted based on type of stakeholder group, what was most obvious was the similarity in thinking across stakeholder groups and the degree of agreement exhibited among the workgroup members in terms of the topics of highest priority.

During the course of the discussion by the workgroup, two additional topics were added for discussion.

- The importance of an effective audit program
- The importance of revising the existing numeric criteria

Workgroup members reached general consensus on categories of solutions to current problematic aspects of the RSRs.

# Recommendations

Overall, the workgroup generally came to consensus on most topics, with slight variations in degree of change or specific details. However, the types of changes that are needed and the direction such changes should take were clear.

***Timing***

Recognizing that new legislation associated with transformation would result in additional sites entering a remediation program and that the RSRs would provide pathways for an exit from the new program, the workgroup agreed unanimously that the RSRs must be "fixed" before the legislation is proposed. Such a fix would ensure that stakeholder and public concerns regarding the transformation would be considered in the context of understanding what the "exit" (or closure) options from the program would be. The workgroup also agreed that even without a transformed remediation program, changes to the RSRs would significantly improve the existing program.

***Consistency with Other Laws***

It was agreed during the workgroup meetings that many of the suggested improvements could be implemented by changing the RSRs themselves without making broader changes to the regulatory framework. However, the workgroup agreed that such changes could be even more effective in the context of the pending transformation of DEEP's remediation programs. It was further understood that some of the recommended changes might conflict, and require reconciliation, with other laws. An example of such potential conflict might be with the existing WQS promulgated pursuant to Connecticut General Statutes (CGS) Section 22a-426.

***Conceptual RSR Revisions***

The following is a general summary of the workgroup's recommendations for changes to the existing RSRs as endpoints for closure of sites, either under the current regulatory framework or under a revised regulatory framework resulting from the transformation process.

The workgroup members unanimously agreed that it is necessary to provide additional ways for achieving closure under the RSRs. The group divided these possibilities into three broad categories:

- Complying with default criteria specified in modified RSRs (i.e., meet established default, numeric criteria through prescribed options and scenarios) by:
  - Increasing the number of options/scenarios and default criteria – e.g., increased number of categories of default criteria (GW1, GW2, GW3, etc.).
  - Providing more options for use of ELUR- or Activity Use Limitation (AUL)-type solutions, including those that are self-implementing.

- Making it easier to use existing and additional site-specific options that are either self-implementing, or can be approved by an LEP without the need to obtain approval from DEEP, by:

- Providing the ability to use site-specific options under specified conditions, with LEP approval that site-specific conditions have been met.
- Enhancing or developing elements of site-specific options, including risk characterization and risk assessment with the understanding that use of such tools would require further development of supplemental elements including:
    - an effective audit program to ensure compliance
    - defined decision processes for self-implementing options
    - assurance of long-term validity of the site-specific assumptions, and
    - transferability of long-term rights and obligations (e.g., remediation approvals apply to the land, rather than a party).

- Making it easier to demonstrate that complying with the groundwater portions of the RSRs is technically impracticable, thereby enhancing the use of the Technical Impracticability (TI) variance option by:
    - Identifying criteria for a) demonstrating applicability and protectiveness of a TI variance; b) demonstrating that a TI variance is applicable and appropriate for closure of the release remediation; and c) ensuring that the release subject to a TI variance does not, and will not in the future, adversely impact human health or the environment.

    - Incorporating ideas from the current TI workgroup based on its discussions of options and mechanisms for use of the TI variance for additional situations beyond those for which it has previously been approved. Topics under discussion by the current TI workgroup include: use of Engineered Control Variances for groundwater, TI for volatilization criteria, TI for residual sources, and MNA vs. TI.

As a general summary of the workgroup's thoughts concerning broad revisions to the RSRs, it was clear that the key issues for success would be increasing the options for closure using default scenarios and associated criteria, increasing the availability of self-implementing options for site-specific scenarios, and increasing the opportunities for using a TI variance to reach closure.

The workgroup also strongly emphasized the need for increased flexibility to achieve closure without DEEP approval. In the workgroup's opinion, any revised program that does not include increased opportunities for self-implementing closure would not be successful in getting sites through the system in a timely and efficient manner and the revised program would effectively suffer from the same problems as the existing program.

***Priority Technical Issues***

In addition to evaluating the broader categories of how enhanced opportunities for closure might be accomplished within the context of revised RSRs, the workgroup developed a condensed list of priorities consisting of specific topics within the RSRs that must be addressed. The workgroup felt that even without a transformed remediation program, changes to the RSRs would significantly improve the existing program.

The workgroup agreed on the following condensed list of topics that required changes to improve the current RSRs, thereby improving the process by which sites could reach closure, and reducing the associated time-frame. The topics considered to be the highest priority for change are:

- The current tiered approach (GA, GB) is too limiting and not sufficient (i.e., more than two risk scenarios can exist that would each have different exposure assumptions).
- Recalcitrant plumes – Currently no method exists to achieve closure within a reasonable time-frame. Such considerations as MNA and very low criteria for monitoring requirements were also considered to be an aspect of this topic.
- Limitations on risk-based analysis and closure, especially when no pathway and receptors are present.
- The requirement for full groundwater assessment and/or compliance/post-remediation monitoring for well-defined shallow impacts to soil that are limited to depths above the water table.
- PMC impact to soil with no corresponding groundwater impact.
- Too rigid and inflexible – create a Response Action Performance Standard that would allow flexibility, yet still provide adequate protection for human health and the environment.
- NAPL issues – definition, mobility, etc.

These topics are presented in no particular order, since some variations in priority were noted among the various workgroup members. More details on these topics are provided below in the "Discussion" section of this report.

In summary, the workgroup's recommendations focused on three main principles – 1) RSR changes should precede transformation legislation; 2) improved flexibility is needed in mechanisms and pathways to achieve closure at sites, which could be accomplished by increasing the number of categories and scenarios for default criteria and increasing self-implementing, site-specific options that do not require DEEP approval; and 3) a mechanism(s) to ensure that whatever changes made to the current approach would be protective of human health and the environment.

# Discussion

The RSRs currently represent an endpoint for reaching closure and would continue to represent an endpoint for closure under a transformed program. The workgroup understood that

efficiency and expediency of remediation and closure must occur within a context in which protection of human health and the environment is of utmost importance. The workgroup also concluded that many, if not most, of its recommended changes could be made independent of significant changes to other aspects of the remediation programs.

Specific technical discussion of the issues identified in the workgroup's condensed list of higher priority RSR changes is provided in the following paragraphs.

- The RSRs currently provide only a few alternatives to the most conservative default criteria. Greater self-implementing flexibility is needed to conduct site-specific closures based on an understanding of how site conditions differ from the assumptions behind these default criteria, for both physical properties and exposure pathways.

- The current two-tiered approach (GA/GB) to groundwater remediation does not consider differently areas that are classified GA, but have had water service extended over the past three decades (since the original classification). These areas often are not in current use as an active water supply, and alternative remedial criteria should be developed to ensure protection for the drinking water exposure pathway along with protection of the resource from degradation. Similarly, the two-tier Residential/Industrial-Commercial volatilization criteria do not provide for a non-residential use such as recreational, where there could be greater flexibility on certain of the long-term restrictions associated with the industrial commercial standard, while still assuring the protection of human health.

- Sites with recalcitrant groundwater conditions, residual source areas, or conditions where MNA will take a long time will need a better mechanism than what is currently available to achieve verification under the RSRs. Closure of a steady state or recalcitrant plume must ensure that there are no complete exposure pathways and that the long-term conditions will remain protective. Closure should be based on the completion of an adequate evaluation of subsurface conditions, contaminants of concern, sensitive receptors and a projection of long-term groundwater conditions and attenuation to demonstrate compliance will be achieved in the future. Alternatively, an LEP should be able to utilize other mechanisms to obtain closure once, as discussed above, conditions are fully assessed. The mechanisms may include an enhanced TI variance, site-specific criteria, or default criteria, depending on the site-specific conditions.

- Current regulatory requirements for an extensive groundwater assessment and monitoring program can require more groundwater investigative effort than scientifically necessary for some release remediation verifications. The RSRs should allow use of alternative, technically appropriate methods to demonstrate that a release is unlikely to have caused impact to groundwater above criteria due to the scale or timing of the release and site conditions such as a deep water table. Similarly, if soils

contain impacts that exceed the pollutant mobility criteria but a groundwater assessment finds that there is no release from this soil to groundwater, further groundwater testing for verification of groundwater RSR compliance should not be required.

- The RSRs require the approval of the Commissioner for many of the existing alternative remedial criteria and approaches. This approval process can often cause delay. The consequence of the delay can be avoidance of these options, and avoidance of self-implementing alternate options, or additional work of limited technical necessity to avoid the potential risk of an adverse audit outcome long after the work is believed to be adequately completed.

- The current practical end result of NAPL definitions and requirements in the RSRs, combined with very conservative criteria for some constituents, creates a perception (some might say a reality) that it is not possible to close sites with NAPL. Revised NAPL and TI sections of the RSRs could provide a more functional means of determining that the NAPL-removal requirement has been met, along with a clearer regulatory path to a practical TI implementation or an alternative groundwater closure, if appropriate.

Throughout discussions of RSR revisions to facilitate closure of sites in a more efficient manner, the workgroup realized that several of its recommendations might conflict with existing statutes and/or regulations. The first step to resolving such issues would be to identify specific statutes and regulations that would need reconciliation with some potential revisions to the RSRs. Subsequent steps would involve finding solutions to the conflicts that were noted, which could include revising other statutes and regulations or revising proposed changes to the RSRs to resolve conflicts.

The group identified and discussed several methods for creating the necessary balance between allowing more opportunities for site closure that do not involve direct DEEP oversight or approval and creating a program that continues to ensure protection of human health and the environment. The following bullets briefly describe four of the most highly ranked possibilities included in the group discussions.

- Creating a “Response Action Performance Standard” which would describe, in regulation, the standard of care for work performed by LEPs, while also allowing LEPs to explain any scientifically defensible deviations from a “standard” approach. This concept, which is a fundamental aspect of the Massachusetts Contingency Plan (MCP), provides the Massachusetts Department of Environmental Protection with overarching authority to hold a licensed environmental professional (Licensed Site Professional [LSP] in Massachusetts) to a standard of care it expects of LSPs during performance of their duties associated with the investigation and remediation of sites. However, language is also included in the MCP that provides support for LSPs, in that an LSP may explain his

or her reasons for a particular approach to the work performed or the techniques used should they have opted to proceed in a manner that was not consistent with prevailing standards and guidelines. The specific language included in the MCP provided in Appendix A is an example for what might be considered.

- Incorporating the concept of "No Significant Risk" into the RSRs or any other regulations that declare the endpoint for closing a site. This concept, which is also fundamental to the MCP, recognizes that the objective of any site closure is to provide assurance that the neither the public nor the environment will be at unacceptable risk once a site is closed. Such closure could be accomplished by demonstrating that no exposure pathways to a receptor exist or would exist in the foreseeable future or that the concentrations to which a receptor might be exposed would be low enough that the risk is within acceptable limits. Focusing on the concept of evaluating and eliminating significant risk to a receptor through a variety of mechanisms, including institutional or engineered controls, as well as risk characterization/risk assessment scenarios, places the objective for investigative and remedial effort within a context that can be understood by all stakeholders.

- Creating and maintaining an effective, consistent and transparent audit program that can also function as an educational tool improving compliance with the regulations on an on-going basis. Members of the workgroup observed that it might be expected that the number of sites at which audits could be expected would decline over time as LEPs, as well as DEEP staff, became more familiar with regulatory changes. The exchange of information between both sides of the audit process would serve as an effective educational tool if the information derived from those audits was publicly presented to the regulated community as a whole and internally to DEEP staff. One mechanism for education of all affected stakeholders involved in investigation and remediation should be the presentation of example case studies that would be provided without disclosing the details of a specific site or identities of the parties involved in a specific investigation or remediation project. Other educational tools should be Question and Answer (Q&A) documents that discuss frequently encountered issues that are identified during the audit process.

- Offering enhanced compliance assistance through communication between the DEEP, LEPs, and responsible parties. In the context of LEP-led sites, compliance assistance should include opportunities for LEPs to discuss particularly problematic aspects of an individual site or clarification on a particular aspect of the regulations and DEEP's interpretation thereof. Compliance assistance through discussions with DEEP personnel could be an important consideration at various points during the investigation and remediation process, particularly for those situations that might be outside the typical scenarios encountered. Compliance assistance could also include publishing Q&A

documents on topics that seem to come up most frequently either through the compliance assistance framework or through the auditing program. The workgroup believes that compliance assistance by the DEEP would improve the potential for successful and predictable outcomes at the verification of compliance with the revised RSRs, thereby improving overall confidence by all stakeholders in the remediation program as a whole. To provide effective compliance assistance and to achieve a level of confidence within the regulated community, it would be necessary for DEEP to establish an internal program of communication and education, so information obtained from DEEP is consistent over time and across personnel, thereby increasing its reliability provided there has been no significant change in the relevant facts.

Overall, the workgroup group feels that it was able accomplish a lot within the very limited time-frame available. While the workgroup recognizes that it was not able to cover the full range of possible topics or discussion of potential solutions, it does believe that this report identified major issues and provided a broad range of possible solutions. The recommendations in this report represent the next step in what the group understands to be an incremental process of transformation.

# *Appendix A*

## *Representative Language Describing a "Response Action Performance Standard"*

The following excerpt was taken from the Massachusetts Contingency Plan (310 CMR 40.000 et seq.) as an example of language that could be incorporated in regulation to described a standard of care for licensed environmental professionals performing investigation and remediation activities.

**40.0191: Response Action Performance Standard (RAPS)**

(1) The Response Action Performance Standard (RAPS) is the level of diligence reasonably necessary to obtain the quantity and quality of information adequate to assess a site and evaluate remedial action alternatives, and to design and implement specific remedial actions at a disposal site to achieve a level of No Significant Risk[1] for any foreseeable period of time and, where feasible, to reduce to the extent possible the level of oil and/or hazardous materials in the environment to background levels.

(2) RAPS shall be employed during the performance of all response actions conducted pursuant to 310 CMR 40.0000, and shall include, without limitation, the following:

(a) consideration of relevant policies and guidelines issued by the Department and EPA;

(b) use of accurate and up-to-date methods, standards and practices, equipment and technologies which are appropriate, available and generally accepted by the professional and trade communities conducting response actions in accordance with M.G.L. c. 21E and 310 CMR 40.0000 under similar circumstances; and

(c) investigative practices which are scientifically defensible, and of a level of precision and accuracy commensurate with the intended use of the results of such investigations.

(3) The application of RAPS shall be protective of health, safety, public welfare and the environment and shall include, without limitation, in the context of meeting the requirements of this Contingency Plan, consideration of the following:

(a) technologies which reuse, recycle, destroy, detoxify or treat oil and/or hazardous materials, where feasible, to minimize the need for long-term management of contamination at or from a disposal site;

[1] No Significant Risk, as defined in the MCP, means a level of control of each identified substance of concern at a site or in the surrounding environment such that no such substance of concern shall present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time.

(b) containment measures as feasible Permanent Solutions only where reuse, recycling, destruction, detoxification and treatment are not feasible;

(c) remedial actions to reduce the overall mass and volume of oil and/or hazardous material at a disposal site to the extent feasible, regardless of whether it is feasible to achieve one or more Temporary Solutions and/or Permanent Solutions or whether it is feasible to achieve background for the entire disposal site and not include the dilution of contaminated media with uncontaminated media; and

(d) response actions to restore groundwater, where feasible, to the applicable standards of quality within a reasonable period of time to protect the existing and potential uses of such resources.

**40.0193: Technical Justification**

(1) A Licensed Site Professional may provide technical justification for forgoing any specific activity required by 310 CMR 40.0000, related to Initial Site Investigation Activities performed in accordance with 310 CMR 40.0405(1), Phase I Initial Site Investigation Activities performed in accordance with 310 CMR 40.0480 through 310 CMR 40.0483, Phase II Comprehensive Site Investigation Activities performed in accordance with 310 CMR 40.0830, and Phase III Identification and Evaluation of Response Action Alternatives performed in accordance with 310 CMR 40.0850 through 310 CMR 40.0860, if in his or her professional judgment any particular requirement is unnecessary or inappropriate based upon the conditions and characteristics of a disposal site. The LSP shall employ RAPS in determining whether any such activity is unnecessary or inappropriate.

(2) When forgoing any particular activity in accordance with 310 CMR 40.0193(1), the LSP shall identify such activity, and shall set forth the basis for such technical justification, in the pertinent submittal.