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KEYS TO INCREASING VOLUNTARY CLEANUPS IN MISSOURI

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I. INTRODUCTION

A prevalent misconception is that enforcement by state and federal agencies drives most of the remediation[2] of environmental contamination. In fact, most remediation of environmental contamination takes place voluntarily in preparation for or in connection with corporate mergers, acquisitions and real property transfers. In many transactions, environmental issues are resolved with or without remediation, without a need to involve state regulators. Some buyers (often foreign investors) and some lenders, however, require a seller to clean up the property and obtain assurance from the State that the remedial effort achieved State cleanup standards to minimize the risk of future cleanup costs to the buyer. In addition, parties motivated by factors other than a property transaction, such as avoiding possible future enforcement, may desire concurrence of the Missouri Department of Natural Resources (MDNR) on remedial work.

At the urging of a wide coalition of interests including business and industry, the Missouri Legislature passed a Voluntary Cleanup Law in 1993.[3] The business community lobbied for the law to increase investment in Missouri by providing an efficient mechanism for achieving closure of a real or perceived environmental problem.

A strong voluntary cleanup law, rationally implemented, that promotes cleanups is necessary to improve the marketability of contaminated properties, particularly if older industrial parcels are to be restored. Facilitating the cleanup and conveyance of contaminated sites will encourage more investment in Missouri, which should contribute to increased economic and job development in the State.

There are two very different audiences evaluating whether to utilize the voluntary cleanup program in Missouri. First, there are parties to a contaminated property transaction for whom time is of the essence and who are typically proposing a "dig and carry" solution. To this audience, the science behind remedy selection is largely irrelevant and efficient procedures for obtaining approval are paramount.

The second audience is motivated to enter the voluntary cleanup program to reduce future liability, reduce or eliminate the likelihood of enforcement under federal or state remediation statutes or to prepare for a possible future transaction. Since time is not critical to this audience, longer term remedies which consider the stabilization and containment of contaminants are of interest. To date, this second audience generally has not come forward in Missouri. Much of the discussion that follows addresses the needs of this audience.

This article will identify the strides made by the State of Missouri in promoting voluntary cleanups, point out current barriers to a more active voluntary remediation program and recommend possible solutions. Specifically, this article: (1) identifies those ingredients critical to reaching a technical consensus between business interests and MDNR on cleanups; (2) discusses the status of four positive regulatory initiatives under way in Missouri; and (3) recommends fine tuning of these initiatives to achieve the goal of more voluntary cleanups and more property transactions in the State.

II. KEY INGREDIENTS TO FORMING A TECHNICAL CONSENSUS ON CLEANUPS

Perhaps nothing has been more elusive for both legal and technical environmental professionals than achieving a consensus on how to clean up contaminants in soil and groundwater and to what level. A classic example of the historic gulf between regulators and industry concerns EPA's future land use assumptions, whereby all contaminated soil, regardless of depth, had to be rendered safe for consumption by children. At all levels of enforcement, this infamous assumption has now been rejected. EPA recently issued a directive titled "Land Use in the CERCLA Remedy Selection Process,"[4] geared to producing site activities consistent with reasonably anticipated future land use.

In Missouri, a lack of consensus remains on the basic ingredients to a technical negotiation. For businesses and landowners to initiate voluntary

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[2] Throughout this article, the terms "cleanup" or "remediation" will serve as shorthand for the process of identifying and quantifying contaminants in soil and/or water, selecting appropriate remedies and cleanup levels, completing the remedy, and verifying achievement of goals.

[3] MO. REV. STAT. §§ 260.565-.575 (Supp. 1996). The new provisions, titled Voluntary Remediation, are subsections of the Missouri Hazardous Waste Management Law.

[4] OSWER Directive No. 9355.7-04.

remediation with MDNR, there must be agreement upon how to reach the technical decisions that determine the cleanup means and ends. In the highly developed and regulated cleanup programs - the Comprehensive Environmental Response, Compensation and Liability Act (known as Superfund) and the Resource Conservation and Recovery Act (RCRA) Corrective Action - there is too much methodology and too many steps.[5] The remedial process in these arenas is very slow since every substantive document submitted during the investigation and cleanup has to be reviewed and approved by regulators. Consequently, cleanup efforts under these programs are cumbersome and paperwork and oversight costs are mounted on top of actual cleanup costs. Yet, for sites not encompassed by these programs, there historically have been no established procedures or standards. Industry had little incentive to voluntarily clean up sites because of uncertainty over what would be required and the high cost of achieving overly protective standards.

To encourage more voluntary efforts, three primary ingredients are necessary. First, industry must insist that money spent on remediation reduce an identifiable risk. Second, there must be an increased recognition by regulators that some remediations are technically impracticable. Third, regulators must realize that in some cases the concerns of a cleanup can be adequately addressed by institutional controls, thus avoiding the need for extensive cleanup.

A. Remediation Commensurate with the Degree of Risk

Not all of the environment is the same. For example, contaminated groundwater that is not used for drinking water poses less risk to human health than does groundwater used for drinking water. Consequently, cleaning up groundwater to stringent drinking water standards unnecessarily wastes resources if no one will ever drink the water.

There is a nationwide trend toward making the extent of remediation commensurate with the degree of risk. The trend is illustrated by California's recent move toward replacing active remediation of contamination in low risk groundwater with monitoring in the state's Leaking Underground Fuel Tanks (LUFT) program.[6] A study commissioned by the California Water Resources Control Board found that the impacts to the environment from leaking Underground Storage Tanks (USTs) were not as severe as once thought.[7] The study showed that benzene rarely impacts water supply wells because residual fuel hydrocarbon plumes typically are stable at relatively short distances from the source and LUFT releases typically occur in urban settings where shallow groundwaters are not used.[8] Yet, considerable amounts of money and groundwater resources had been spent for groundwater cleanups affecting a very small proportion (0.0005%) of California's total groundwater resources.[9]

The study concluded that because a meaningful risk-based decision-making framework was not currently being used "[t]ime and money are being misallocated to technically unfeasible groundwater remediation strategies, cleaning up groundwater that may not have a foreseeable economic beneficial use."[10] The study recommended that passive bioremediation[11] should be considered as the primary remediation tool in most cases, once the fuel leak source has been removed.[12] Finally, the report urged that a modified ASTM Risk-Based Corrective Action (RBCA) decisional framework be developed and applied to selection of remedy and cleanup goals.[13] While the LUFT agency responds to the report's recommendations, the agency has directed that active remediation be replaced with monitoring in cases affecting low risk groundwater.[14]

The change in the California LUFT program is just one example of the trend toward risk-based thinking. For a voluntary program to generate support and large scale use, a methodology to assess risk is essential.[15]

B. Recognition of Technical Impracticability

A second key ingredient for technical consensus is recognition that some remedies are technically impracticable. EPA

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5 *See, e.g.*, Hazardous Substance Response (National Contingency Plan), 40 C.F.R. §§ 300.400-330.440 (1994).

6 Memorandum from Benjamin D. Kor, Executive Officer, California Regional Water Quality Control Board, North Coast Region (Dec. 8, 1995).

7 Recommendations to Improve the Cleanup Process for California Leaking Underground Fuel Tanks (LUFTs), Lawrence Livermore National Laboratory, University of California (October 16, 1995) (hereinafter LLNL Report).

8 *Id.* at 15-16.

9 *Id.* at 16.

10 *Id.* at 18.

11 Bioremediation is the microbial degradation of contaminants in soil or groundwater into nonhazardous substances.

12 LLNL Report, at 19.

13 *Id.* at 20.

14 Memorandum from Walt Pettit, Executive Director, California Water Resources Control Board, to all Regional Water Board Chairpersons, Regional Water Board Executive Officers, and LOP Agency Directors (Dec. 8, 1995).

15 This Missouri legislature recently appropriated money to MDNR to fund the Comparative Risk Project. Comparative risk integrates awareness and technical information with public perception by ranking environmental issues according to their priority for corrective action. Fundamental to comparative risk is the concept that the risk to human health and quality of life is given equal weight with the risk to the environment. The comparative risk process is an innovative way to incorporate public perception of perceived environmental risks with technical and scientific information. Comparative risk is used to set environmental priorities for state environmental agencies. Greg Moldafsky, *Editor's Perspective: Environmental Reform is Risky Business*, 3 Mo. Env't. L. & Pol'y. Rev. 61 (1996).

has historically insisted that responsible parties embark on cleanups which everyone knows will never reach desired analytical goals and that once failure has been demonstrated, the analytical goals can be renegotiated. The financial waste and lack of closure under this approach discourages voluntary effort.

EPA now recognizes that attaining required groundwater cleanup levels of certain contaminants, such as non-aqueous phase liquids (NAPLS), is often technically impracticable from an engineering perspective. Accordingly, EPA has developed guidance for RCRA and CERCLA projects that allows a range of alternative cleanup options in such cases, including natural attenuation.[16]

C. Use of Institutional Controls

A third ingredient for achieving technical consensus is the use of institutional controls such as recorded deed notices or restrictions limiting future use of property. Depending upon the location and probable use of property, these controls often suffice to safeguard public health and the environment, making costly cleanups unnecessary. The concept of institutional controls works hand in hand with risk assessment. Where a high volume, low risk soil contamination exists (as often found at old industrial properties), the only exposure "pathway" may occur if the soil is disturbed. A deed restriction which notifies purchasers that excavation in a certain area must be accomplished with appropriate protective measures may be warranted for such sites. There is nothing novel in this approach as deed restrictions and other such exposure controls have been in use for years.[17]

The application of these procedures - risk assessment, technical impracticability demonstrations, and institutional controls - will not defer remediation where it is called for. Where contaminants are not stable and there is a real threat of exposure, aggressive removal actions are appropriate. In many cases, however, where contaminants have been in place for decades, it is very legitimate to ask whether managing the problem is a better investment than attempting to eliminate the problem.

III. Four Initiatives in Missouri Affecting Cleanup Decisions

Several new initiatives in Missouri begin to provide a methodology for making rational cleanup decisions. These include the Voluntary Cleanup Program, the Uniform Cleanup Standards Guidance, Brownfields legislation and an industry proposal for groundwater classification.

A. The Evolution of the Voluntary Cleanup Program

To implement the 1993 Voluntary Cleanup Law, the Hazardous Substance Environmental Remediation regulations were adopted effective August 1994.[18] The Hazardous Substance Environmental Remediation Program (commonly referred to as the Voluntary Cleanup Program (VCP)) was established to provide the MDNR review and oversight mandated by the law for voluntary cleanups. In general, any site which has hazardous substance or hazardous waste contamination is eligible for the VCP. The exceptions are sites constituting an imminent and substantial threat to public health or the environment, sites being considered for listing on the National Priorities List under CERCLA, or sites warranting enforcement action under RCRA, CERCLA or the Missouri Hazardous Waste Management Law.[19]

The basic steps for participation in the VCP are:

- submission of an application with a $200 application fee;
- execution of an Environmental Remediation Oversight Agreement[20] with a deposit of up to $5,000 to cover MDNR oversight costs;
- submittal of a Remedial Action Plan;[21]
- submittal of quarterly progress reports during ongoing remediation projects;
- submittal of a final report; and
- issuance of a "No Further Action" letter by MDNR.[22]

Since its inception in November 1994, the number of sites in the VCP has grown from approximately 6 to 27 as of January 17, 1996.[23] As of that date, remediation was complete at five sites. Remediation at four sites is under way and 18 sites are in the investigation phase.[24] None of the sites where voluntary remediation has been completed or is in progress involve contaminated groundwater, although it appears that

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[16] Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, OSWER Directive 9234.2-25 (Sept. 1993) (hereinafter Guidance for Ground-Water Restoration).

[17] *See, e.g.*, restrictions and recorded notices required by Mo. Rev. Stat. §§ 260.435-.470 (1990), regarding abandoned or uncontrolled hazardous waste sites; *see also* deed notices of residual contamination in proposed correction action regulations under RCRA, 55 Fed. Reg. 30798, 30882 (to be codified at 40 C.F.R. §§ 264-65, 270-71).

[18] *See* Mo. Code Regs. tit. 10, § 25-15.010 (1994).

[19] *Id.* § 25-15.010(3)(D).

[20] The Environmental Remediation Oversight Agreement is a site-specific contract between the remediator and MDNR, setting forth the remediator's responsibilities for submission of plans and reports and MDNR's responsibility for document review and approval and other oversight functions.

[21] The Remedial Action Plan addresses the selected remedial actions, cleanup goals, schedule of activities, sampling and other remedial matters.

[22] Mo. Code Regs. tit. 10, § 25-15.010(3)(B)(4)(6).

[23] *See* MDNR document, "Sites Participating in the Voluntary Cleanup Program as of January 17, 1996."

[24] *Id.* at 6-7, 1-6.

contaminated groundwater will be addressed at some of the sites that are in the investigation phase.[25]

The sites remediated to date have used as soil cleanup goals the numerical chemical standards listed in the new state uniform cleanup standards guidance document.[26] As of January 1996, not a single site had completed a risk assessment, however, some of the sites currently in the investigation phase may proceed with establishing alternate cleanup standards using a risk-based approach.[27]

Illinois has a longer history with voluntary cleanups and a much more extensive voluntary site cleanup program. As of Fall 1995, 350 sites in Illinois were pursuing voluntary cleanup and 130 sites had completed remediation, gaining a "no further remediation" letter from the Illinois Environmental Protection Agency (IEPA).[28] Recently, IEPA began to formalize its risk-based procedures for selecting cleanup objectives.[29] IEPA's new guidance outlines a three-tiered, site-specific approach that allows for considerable flexibility. Cleanup levels are based on risk and are coupled with institutional controls where less stringent cleanup objectives are approved.[30]

B. How Clean is Clean? - Uniform Cleanup Standards

In April 1995 the MDNR Division of Environmental Quality issued its long-awaited guidance, "How Clean is Clean? - Uniform Clean Up Standards For Contaminated Sites in Missouri" (UCS Guidance).[31] The UCS Guidance defines two tiers of remediation goals based on the nature of the contamination and the site. First, the remediator must identify all of the contaminants and contaminated media at the site. This information then is used to determine which tier the contamination fits and helps MDNR identify a target cleanup standard (TCS) for the cleanup.[32]

The Tier 1 uniform cleanup standards are based on the lowest of certain statutory, regulatory, and guidance standards for environmental media: air, soil, surface water, and groundwater. In a Tier 1 cleanup, if a uniform standard for the contaminant can be identified, it becomes the TCS.[33] Meeting this Tier 1 standard constitutes a "walk-away" remediation for the purposes of voluntary cleanup. That is, no further action will be required of the voluntary remediator.[34]

The Tier 1 uniform cleanup standards for soil are the Department of Health Any-Use Soil Levels (proposed and withdrawn in 1992) and levels listed in Table 3 of the Missouri Corrective Action Guidance Document (February 1992).[35] These standards are predicated on the residential use of property. To ensure that the cleanup protects the groundwater after remediation, the UST Guidance requires that representative samples of the soil be subjected to the RCRA Toxicity Characteristic Leaching Procedure (TCLP).[36] Surface water must meet the Missouri Water Quality Standards maximum contaminant levels.[37]

The Tier 1 uniform cleanup standards for contaminated groundwater consists of two very conservative sub-tiers: 1) the background level of the contaminant; or 2) the maximum contaminant levels of the Missouri Water Quality Standards, if achieving background is technically impracticable.[38] In addition, where a Missouri Water Quality Standard or relevant

[25] *Id.* at 7-9, 1-5.

[26] *See infra* text accompanying notes 31-46.

[27] *Id.*

[28] Statistics supplied by Robert O'Hara, Manager, Pre-Notice Site Cleanup Program, Illinois Environmental Protection Agency.

[29] *See* ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, TIERED APPROACH TO CLEANUP OBJECTIVES GUIDANCE DOCUMENT (1996) (hereinafter TIERED APPROACH). To develop its procedures IEPA used as models both the American Society for Testing and Materials (ASTM) standard ES38-94, AMERICAN SOCIETY FOR TESTING AND MATERIALS, EMERGENCY STANDARD GUIDE FOR RISK-BASED CORRECTIVE ACTION APPLIED AT PETROLEUM RELEASE SITES, and the UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (USEPA) DRAFT GUIDANCE FOR SOIL SCREENING LEVELS, BUREAU OF LAND, ILLINOIS ENVIRONMENTAL PROTECTION AGENCY (1996).

[30] TIERED APPROACH, *supra* note 29.

[31] MDNR conducts and oversees environmental cleanups through a number of programs, including leaking underground storage tank (LUST) cleanups, Resource Conservation and Recovery Act (RCRA) corrective actions and closures, removal and remediations under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and state Hazardous Waste Registry cleanups, voluntary cleanups, asbestos and lead removals, and environmental emergency responses. Because different methods for determining cleanup goals exist under these various laws and regulations, MDNR formed an internal Uniform Cleanup Standards Work Group to develop consistent standards across all programs involved in site remediation. The work group was charged with developing cleanup standards and methodologies for soil, air, and water contaminants that will satisfy the concerns of the entireDivision of Environmental Quality. The work group produced the UCS Guidance and recommended that it be used on a trial basis within the Voluntary Cleanup Program for at least one year to allow for improvements HOW CLEAN IS CLEAN?; UNIFORM CLEANUP STANDARDS FOR CONTAMINATED SITES IN MISSOURI, MISSOURI DEPARTMENT OF NATURAL RESOURCES 1 (1995) (hereinafter UCS GUIDANCE).

[32] *Id.* at 9.

[33] *Id.* at 10.

[34] *Id.* at 9.

[35] *Id.* at 10. Both documents are attached as appendices to the UCS GUIDANCE.

[36] *Id.* at 11. An extract from a representative sample of the remediated soil may not contain any of the contaminants listed in the Water Quality Standards for ground water at a concentration equal to or greater than the maximum contaminant level (MCL) given in MO. CODE REGS. tit. 10, § 20.7 (1994).

[37] UCS GUIDANCE, *supra* note 31, at 11. The remediator may be required to obtain a National Pollutant Discharge Elimination system (NPDES) permit or other authorization from MDNR. *Id.*

[38] *Id.* The assessment must be conducted according to the Guidance for Ground-Water Restoration. *See supra* note 16. The UCS GUIDANCE defines "technical impracticability" as

> non-feasibility of a remediation due to 1) engineering infeasibility, in which current engineering methods necessary to construct and maintain a cleanup

MCL does not exist, MDNR has also applied EPA Region III criteria for drinking water. If meeting the maximum contaminant levels is shown to be technically impracticable, the remediator can propose an alternate clean-up standard under Tier 2.[39]

The Tier 2 procedures are used if a uniform standard for the contaminant cannot be found or other conditions render the uniform standard inappropriate. The remediator then must propose an alternative cleanup standard (ACS), supported with a risk assessment, which the agency may approve or deny.[40] A Tier 2 cleanup, however, may require that the site be placed on the state Registry of Confirmed Abandoned or Uncontrolled Hazardous Waste Disposal sites.[41]

The UCS Guidance is undergoing initial application on sites approved for the VCP. For this reason, the UCS Guidance defers to CERCLA requirements for site inspection, risk assessment, and quality assurance/quality control standards.[42] Following a trial period and further modification, the MDNR hopes the UCS Guidance will be used by all of the agency's programs that oversee or conduct site remediation.[43]

The two-tier system is designed to provide some flexibility in establishing cleanup levels. How much leeway will be allowed is unknown at this point, since no Tier 2 voluntary cleanups of contaminated soil or groundwater have occurred. While laudable in theory, the "devil is in the details." A number of the Tier 1 soil cleanup levels mandated by the UCS Guidance are far more stringent than those chosen in past Superfund cleanups in Missouri.[44] The State's drinking water standards applicable to groundwater cleanup are more conservative than EPA's regulations.[45] These and other aspects of the UCS Guidance operate to discourage voluntary cleanups and act as barriers to site specific decision making. These issues will be discussed in more detail in the next section.

C. Brownfields Legislation

Businesses establishing new operations have shunned old facilities in cities because of contamination from years of manufacturing. Because of the liability and costs of cleanup, companies have left these "brownfields" properties for suburban or rural "greenfields." As a result, cities often end up owning many of the unused contaminated properties.

In 1995, the Missouri Legislature passed a new "brownfields" law designed to encourage redevelopment of abandoned inner-city properties.[46] The Regional Commerce and Growth Association of St. Louis was a primary supporter of the legislation. The law authorizes grants, loans, loan guarantees and tax credits for remediating certain "brownfields" properties. These abandoned properties are commercial or industrial properties that have reverted to government ownership through donation, purchase, tax delinquency, foreclosure, default, or settlement and have been vacant for at least three years.[47] Generally, cleanup of contamination at these properties is needed.

The law allows the Missouri Department of Economic Development to lend money, guarantee loans and provide grants for acquisition, establishment, expansion, remodeling, rehabilitation, or modernization of industrial, commercial distribution, or research facilities.[48] The stated purpose of this "brownfields initiative" is to create new jobs or preserve existing jobs and opportunities, attract new businesses to the state or prevent existing businesses from leaving the state. Funds authorized under the program can be used for voluntary cleanups of hazardous substances and hazardous waste.[49]

Tax credits may also be granted to the purchaser and operator of an eligible project facility for the full costs of materials, supplies, equipment, labor, professional engineering, consulting and architectural fees, permitting fees and expenses, and direct utility charges for performing the voluntary remediation activities for the preexisting hazardous substance contamination and releases.[50]

To finance eligible projects, the legislation created the "Property Reuse Fund," which consists of appropriations from the General Assembly and funds received through gifts, contributions, grants or bequests. When funds are appropriated, up to $1.0 million annually may be made available for loans, grants, and guarantees for the program.[51]

Brownfields remediation projects are to be conducted through the VCP, after

level cannot reasonably be implemented; or 2) unreliability, in which the potential for the cleanup level to continue to be protective into the future is low. Cost may be considered, although cost should not be the major factor. UCS GUIDANCE, *supra* note 31, at 17.

39 *Id.* at 12-13.

40 *Id.*

41 *Id.* at 10.

42 *Id.* at 9

43 *Id.* The UCS GUIDANCE states, "[i]t is anticipated that a great deal of discussion will be required before the Guidance can be applied to other types of cleanups." *Id.*

44 For example, the UCS standard for lead in soil is 240 ppm versus the 500 to 1000 ppm levels typically set by EPA in CERCLA cleanups. *Id.*

45 MICHAEL BOLLINGER, REGULATION OF GROUNDWATER IN MISSOURI, CURRENT REQUIREMENTS AND RECOMMENDED CHANGES (1994).

46 MO. REV. STAT. §§ 447.702-.718 (Supp. 1996). The new subsections, titled "Abandoned Property" are also known as the "Brownfields Law."

47 MO. REV. STAT. § 447.700(1) (Supp. 1996).

48 MO. REV. STAT. §§ 447.702, 447.704 (Supp. 1996) and 447.706 (Supp. 1996).

49 MO. REV. STAT. § 447.700(3).

50 MO. REV. STAT. § 447.708 (Supp. 1996).

which MDNR will issue the following purchaser releases:

- A no further action letter if Phase I and Phase II assessments show no remedial action is necessary.[52]
- A no further action letter if the voluntary remediation does not attain levels below regulatory action levels due to use of alternative cleanup goals, institutional controls, including deed restrictions or other alternative actions.[53]
- A covenant not to sue if voluntary remediation attains levels below regulatory action levels and the corrective action plan was subject to public hearing and comment.[54]
- Immunity from third party cost recovery claims upon successful completion of a voluntary remediation action.[55]

Regulations to implement the "Brownfields" legislation are being developed. Implementation also must await appropriation of funds by the General Assembly. Although the Brownfields Law is a promising tool, it affects only a portion of the potential universe of voluntary cleanup sites because it is currently limited to government-owned properties.

D. Groundwater Classification Proposal

An important distinction between the regulation of groundwater versus other water bodies is that there are no comprehensive federal laws or regulations for protection of groundwater. Consequently, the regulation of groundwater varies widely from state to state.

Under Missouri law, groundwater is highly regulated, with restrictions placed on activities which may impact aquifers and established numeric standards for groundwater quality.[56] This control is accomplished in part by the inclusion of groundwater within the definition of "waters of the state."[57]

The State Water Quality Standards provide little flexibility with respect to groundwater. Under the UCS Guidance, the Tier I uniform standard for groundwater contaminants is "background."[58] If remediation to the background level is shown to be technically impracticable, the maximum contaminant levels (MCLs) for drinking water can be used as uniform standards.[59] This "one-size fits all" regulation of groundwater does not balance considerations of technical and economic feasibility with protection of human health, the environment and beneficial water uses. Nor do the stringent standards (in some cases set by excessively conservative risk calculations) take into consideration the diversity of the state's subsurface waters. Both groundwater quality and sustainable flow vary widely throughout the state.

The lack of flexibility in Missouri's regulation of groundwater prompted the coalition of businesses known as the Regulatory Environmental Group for Missouri (REGFORM)[60] to submit a proposal, which borrows heavily from other midwestern states, to MDNR for developing a specific groundwater classification system. The central principle embodied in the proposal is that all groundwater resources should not be viewed as being of equal quality. In particular, any regulatory system for groundwater should take into account the strong influence that historic conditions can exert on groundwater quality and useability.

The original proposal sent to MDNR in October 1994 contained three central concepts: 1) the classification of groundwater in Missouri into four separate classes based on potential use; 2) the development of groundwater management zones applicable to releases of groundwater which allow for the management of and/or corrective action for groundwater without concurrent violation of the groundwater standards; and 3) the availability of an alternative concentration limit demonstration to allow risk management and technical impracticability concepts to be included in groundwater management decisions on a case-by-case basis.[61]

On June 30, 1995, in response to comments and concerns raised by MDNR, REGFORM submitted a substantially revised proposal for a specific groundwater classification system that

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51 Mo. Rev. Stat. § 447.710 (Supp. 1996).
52 Mo. Rev. Stat. § 447.714.2(1) (Supp. 1996).
53 Mo. Rev. Stat. § 447.714.2(2).
54 Mo. Rev. Stat. §§ 447.714.2(3)(4).
55 Mo. Rev. Stat. § 447.714.3.
56 *See* Mo. Code Regs. tit. 10, § 20-7.015(7) and Mo. Code Regs. tit. 10, § 20-7.031(5).
57 *See id.* § 20-7.015(1)(a)(6).
58 UCS Guidance, *supra* note 31, at 9.
59 *Id.*
60 REGFORM was formed in December of 1992. It is a not-for-profit corporation dealing solely with environmental regulations. REGFORM allows the business community to speak with a united voice on important regulatory issues. In the past, business was forced into a reactionary mode, responding only to regulations after they were printed in the *Missouri Register*. It is REGFORM's mission to get involved at the front end of the regulatory process. Roger Walker, *The Regulatory Environmental Group for Missouri: White Paper* 1 (1994) (on file at the REGFORM office). REGFORM provides regulators with important, scientific-based data, working knowledge of industry operations, and other vital information in order to streamline the regulatory process and help promulgate regulations which are the most cost effective possible. *Id.*
61 Letter from George von Stamwitz, on behalf of REGFORM, to John Young, MDNR (Oct. 18, 1994).

utilizes groundwater management zones where cleanup is initiated.[62] The submission contained a "Proposed Methodology for Developing Groundwater Standards For Missouri," prepared by an environmental consulting firm.[63] The REGFORM methodology proposes classifying groundwater in Missouri only when necessary.[64] The classification system focuses on setting standards to be applied in the corrective action context. Thus, in most cases, a classification system would set cleanup objectives for groundwater that have been impacted by prior or neighboring use. The use of groundwater management zones would allow site-specific water quality standards and would facilitate the active management of existing local impacts on aquifers. The MDNR Water Quality Standards Work Group has agreed to consider the new proposal in the Fall of 1996.

IV. Recommendations

Two of the four initiatives, the VCP and the UCS Guidance are in operation and the state "Brownfields" initiative is moving toward implementation. These efforts are positive.

The UCS Guidance, which provides the cleanup goals for all sites in the VCP, recognizes to a limited extent the concepts of risk-based remedy selection and technical impracticability and, at least implicitly, the use of institutional controls. Much can be done to improve the UCS Guidance and the regulatory system to provide a user-friendly, efficient and cost-effective voluntary cleanup structure. State regulators, environmental professionals and industry can learn from the more experienced programs of several other states. More specifically, the following problems merit study, dialogue and resolution.

A. Simplified and Site-specific Risk Assessment

From the regulators' perspective, uniform standards save regulatory staff time and legal costs by reducing lengthy negotiations over cleanup goals.[65] But the current lack of flexibility and the cost of achieving cleanup levels that are often overprotective remains in many cases a barrier to voluntary cleanup.[66]

A RBCA approach integrates risk and exposure assessment with site assessment activities and remedial measure selection.[67] The cost and complexity of risk assessments can vary widely. A risk assessment can be as simple as comparing analytical results to published uniform numeric standards or it can be a detailed evaluation of human populations and ecological systems potentially affected by the site. The critical need is for a risk assessment protocol adaptable to the vast array of site conditions.

The criteria used to develop the UCS Guidance, however, are at odds with current trends toward RBCA in EPA and other states. The criteria are:

- encouraging removal of contaminants to natural background or standard cleanup levels, rather than leaving waste in place with long-term monitoring;
- limiting site-specific considerations by allowing risk-based levels only under some conditions;
- discouraging negotiated cleanup levels by specifying when and by what methodology risk assessment may be used; and
- especially protecting groundwater by using public drinking water or Missouri water quality standards.[68]

Although Tier 2 of the UCS Guidance allows for a risk-based determination of less stringent cleanup levels than those provided in Tier 1, as a result of the UCS Guidance criteria, the opportunities for risk assessment are very limited.

First, MDNR may require a remediator to propose an alternate standard if: 1) a contaminant exceeds background

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[62] Letter from Roger Walker, President of REGFORM, to John Young, MDNR (June 30, 1995).

[63] Burns & McDonnell Waste Consultants, Inc., Proposed Methodology For Developing Groundwater Standards For Missouri (1995). The proposal envisions four classifications for groundwater: Class I, Drinking Water Supply Groundwater, Class II, General Resources Groundwater, Class III, Special Resource Groundwater and Class IV, Other Groundwater. The first three classes provide for varying numerical standards. Class IV would apply only to impacted groundwaters where cleanup to Classes I, II, or III is unnecessary (because of useability), impractical, or technologically infeasible. This class would be applied following a hydrogeologic characterization and/or the establishment of a groundwater management zone. *Id.* at E-1, E-2.

Groundwater management zones are intended for use in Classes I, II, and III. An impacted area would be considered a groundwater management zone as long as it is being managed through corrective action or monitoring, or until it is reclassified. *Id.* at 4.

Class IV groundwater is neither potable nor useful for agricultural or industrial purposes, nor of outstanding quality, either due to limited productivity and/or migration potential, natural contamination, historic releases or proximity to regulated disposal areas. The standard may be the concentration present, based on a technical conclusion that further remediation is impracticable or of no benefit to human health and the environment. *Id.* at 7.

[64] *Id.* at E-3.

[65] UCS Guidance, *supra* note 31, at 1.

[66] Much of the cost of site remediation stems from the common requirement that sites be cleaned to "background" conditions or to specific national or state limits. This approach fails to consider, however, that many tightly-bound contaminants in soil are not available to adversely affect human health or the environment; chemical concentrations alone are not sufficient to determine if there will be adverse effect; and some sites, such as "brownfields" industrial sites do not need cleanup to stringent protective levels. Thus, the need for environmental cleanup is highly influenced by whether the released chemicals in soil and water have the potential to reach human or ecological receptors, now or in the future: no injury can occur without exposure. Raymond C. Loehr, Ph.D., Bioremediation and Relative Risk; Looking Ahead, 1995 ABA Sec. Nat. Resources, Energy and Envtl. Newsletter 27.

[67] ASTM, Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, at 1 (hereinafter RBCA).

[68] UCS Guidance, *supra* note 31, at 6-7.

levels and has an adverse impact; or 2) if synergistic effects are indicated for a mixture of constituents. A remediator *must* propose alternate cleanup standards if: 1) mixtures of contaminants threaten human health or the environment; 2) there is no uniform standard for a contaminant or mixture; or 3) the uniform concentration of a contaminant exceeds background and threatens human safety or health. Finally, a remediator may propose an alternate cleanup level only if it is shown that:

- background concentration or detection limit is greater than the UCS; and
- site remediation to meet the UCS is technically impracticable as assessed utilizing EPA's Technical Impracticability Guidance.

Tier 2 alternate cleanup standards require a risk assessment.[69] The circumscribed use of risk assessment in the UCS Guidance presents obvious problems for voluntary remediation. A properly applied RBCA process would avoid mandating use of baseline numeric Tier 1 standards without allowing free access to Tier 2 alternate standards. In addition, there should be more choices of corrective action goals than source removal and treatment, including the use of exposure reduction options such as engineering and institutional controls.[70]

A Tier 2 remediator must perform a risk assessment using EPA's Superfund Risk Assessment Guidance. This procedure is far too cumbersome, expensive, and unnecessary for all but the most complicated sites. Unlike complex CERCLA risk assessment procedures, a RBCA approach can allocate resources efficiently and streamline the process by collecting only the information necessary to make the risk-based remedy selection.

All interested parties should work toward agreement on a more rational and simplified screening of sites for risk to health and the environment,[71] one that is suitable for the less complicated contamination posed by most voluntary sites. Consideration of the Illinois RBCA approach could be a point of departure. The Illinois RBCA procedures consist of a 3-tier site-specific approach for both soil and groundwater remediation. Tier 1, the most conservative level, requires little data. Tier 2, also embodying conservative cleanup levels, considers site-specific data and conditions. Tier 3 provides for use of a more sophisticated risk assessment to determine potential contaminant movement, availability and exposure routes.[72] Thus, Illinois' modified RBCA approach selects the level of data complexity necessary to assess exposure pathways and risk at the particular site. Another important feature of the Illinois guidance is the provision for numeric baseline soil and groundwater cleanup levels for industrial as well as residential property use.[73] A similar addition to the UCS Guidance would be valuable, particularly for Brownfields sites.

B. Wanted: A Policy for Institutional Controls

"Institutional Controls" are those controls that can be used by responsible parties and regulatory agencies in remedial programs where, as a part of the program, certain concentrations of the chemicals of concern will remain on site in soil and/or groundwater. The variety of techniques encompassed by the term are not new. A number of state and federal programs have used institutional controls for some years to assure that exposure to remaining chemical concentrations is reduced to the extent necessary.[74] Among the types of existing institutional controls are deed restrictions or restrictive covenants, recorded notices, registry act requirements, transfer act requirements and contractual obligations.[75] These can be used in various combinations as warranted by post-remediation circumstances.

Deed restrictions condition the use and conveyance of land. They inform prospective owners or tenants of the environmental status of the property and insure long-term compliance with any controls placed on the property. Use restrictions are usually contained in deed restrictions. An example is requiring cleanup to residential use standards prior to changing a non-residential use to residential. Access control can be accomplished by fencing in property and posting warnings. A notice can be filed with a recorder of deeds regarding remediation and post-remediation status. Some states even require the disclosure of site history to potential buyers.[76]

Tier 2 voluntary or Brownfields cleanups allowing less stringent cleanup levels under the UCS Guidance may require that the site be placed on the state Registry of Confirmed, Abandoned or Uncontrolled Sites.[77] Statutory institutional controls are mandated for these registered sites. Placement on the public Registry, a list of highly contaminated sites in the State, is simply the wrong procedure

[69] *Id.* at 12-13.

[70] RBCA, *supra* note 67, at 6.

[71] MDNR has agreed to participate with both industry and engineering groups in a state-wide work group on the UCS GUIDANCE. The purpose of this work group will be to evaluate alternatives and make recommendations for changes in the guidance document.

[72] TIERED APPROACH, *supra* note 29, at iii.

[73] *Id.* at Tables B and C.

[74] *See* RBCA, *supra* note 67, at Appendix X-4.

[75] *Id.*

[76] *Id.* at 93.

[77] UCS GUIDANCE, *supra* note 31, at 10. For the statutory sections governing abandoned or uncontrolled hazardous waste sites, *see* MO. REV. STAT §§ 260.435-.470.

for sites that have been through a voluntary remediation process. A site that has been remediated to a safe and practicable level should not be labeled "Abandoned" or "Uncontrolled" or subjected to public listing. Rather, where contaminants are allowed to be left in place, various institutional controls can be required such as the recording of a "no further action" letter. Such a letter provides notice to potential purchasers of a land use limitation.

No specific provision in the UCS Guidance is made for institutional controls. The UCS Guidance needs to address use of various institutional controls other than Registry listing that will allow issuance of a "no-further-action" letter under the VCP, even though contaminants above uniform standards are left in place. The success of the Brownfields initiative may depend on such a policy.

C. Use of Passive and Intrinsic Bioremediation

California's move toward allowing passive remediation for low-risk petroleum contamination, in a state famous for stringent protection of the environment, recognizes that allowing the environment to cleanse itself over time is more rational than active measures in appropriate circumstances. The California LUFT study found that where a fuel hydrocarbon source is removed, passive bioremediation processes act to naturally reduce plume mass and to eventually complete the groundwater cleanup.[78] Indigenous subsurface soil microorganisms digest hydrocarbons and remove them from the groundwater plume.[79] Minnesota, likewise, has instituted a new policy in its Leaking Underground Storage Tank Program of relying on natural biodegradation where risks posed by contaminants to receptors are low.[80]

Natural attenuation generally will result in attainment of desired cleanup levels but may take longer to meet them than active remediation.[81] This approach is appropriate where the affected groundwater is not and will not be used as a source of drinking water.[82] Where it can be shown, for example, that a contaminated groundwater plume is stable, contained and reducing in contamination, a monitor-only remedy should be acceptable. Explicit recognition of this possibility would encourage participation in voluntary cleanup.

D. Technical Impracticability and Groundwater Classification

In many cases, active groundwater remediation can contain and reduce constituent contaminants although it can never achieve the maximum allowable contaminant levels under current state regulations. The UCS Guidance allows MDNR to consider alternate standards that are higher than the uniform standards upon a showing of technical impracticability, although no criteria are supplied for making such decisions. Nonetheless, many potential remediators will not even approach the agency for voluntary cleanup because they believe groundwater cleanup goals will be set at levels where the site will never attain closure. Where applicable groundwater standards cannot be met due to technical impracticability, a reasonable response is to prevent further migration of a contaminated plume and prevent exposure to the contaminated groundwater. Consequently, the development of a groundwater classification rule is crucial for encouraging the cleanup of these sites, including Brownfields sites, enhancing their marketability, and enabling their return to productive use.

V. Conclusion

Increasing the number of sites participating in the VCP, a goal sought by both regulators and industry, depends on overcoming current barriers that discourage its use. Development and fine-tuning of the initiatives outlined above can help industry and regulators break down these barriers. Bringing existing concepts from the involuntary world of mandated cleanups into the VCP can move the Program in the right direction. In Missouri, all of these concepts are discussed at different times on a case by case basis; however, they need to be explicitly set forth in regulation and guidance to communicate possible methodologies to voluntary remediators.

The development of risk-based correction action strategies that select technically practicable remedies, scaled to the degree of risk and coupled with institutional controls where appropriate, is the key to promoting large scale use of Missouri's Voluntary Cleanup Program.

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78 LLNL Report, *supra* note 7, at 10.
79 *Id.*
80 Minnesota Environmental Compliance Update (1995).
81 Guidance for Ground-Water Restoration, *supra* note 16, at 20-21.
82 *Id*