Green & Sustainable Remediation Roundtable

Convened by the Sustainable Remediation Initiative[1]

June 3, 2014
Washington, DC

Roundtable Overview

The Green & Sustainable Remediation Roundtable comprised a dynamic and experienced group of public and private sector leaders in environmental remediation, convening an informed discussion on the current process for implementing Green and Sustainable Remediation (GSR)[2] across the federal and state cleanup programs, and how to begin improving the opportunities for the advancement of GSR concepts.

Recent years have seen growth in the concepts of "green" and "sustainable" remediation. Implementation of such practices for environmental cleanups has demonstrated favorable impacts from a social and economic perspective and led to positive environmental and public health outcomes. Many stakeholders in the remediation world have embraced the concept of GSR as a way to improve their means of doing business. However, some federal and state organizations face challenges, both structural and historical, to fully embrace GSR concepts. As a result, GSR concepts are being implemented in a patchwork fashion across the U.S., and not all communities are experiencing the potential benefits.

The roundtable included a lively discussion on the challenges and opportunities for better GSR implementation, including actions both public and private sectors can take to overcome obstacles and further the understanding of GSR practices. As such, the roundtable provided a unique opportunity for mutual learning, information gathering, and sharing of views among leaders in environmental remediation.

Refer to Appendices I and II regarding Agenda and Participant List

Opening Remarks

Marianne Horinko, President of The Horinko Group, commenced the roundtable with introductory remarks and asked individuals participating in and observing the roundtable to introduce themselves and state what they hoped to get out of the meeting. Common goals included continued collaboration, identifying shared priorities and common ground from which to move forward, pinpointing concrete follow-up steps and actions, and agreeing upon a mutually supportive, consistent message, all with the shared purpose of carrying the momentum of green and sustainable remediation (GSR)[3] forward.

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[1] The Sustainable Remediation Initiative is a collaboration of The Sustainable Remediation Forum, Interstate Regulatory & Technology Council, and API Energy.

[2] For the purposes of this document, the acronym "GSR" will be used to refer to the comprehensive concept of green and sustainable remediation. The acronyms "GR" and "SR" will be used where the distinction between green remediation and sustainable remediation is relevant to the point made during the roundtable.

Keynote Remarks

Mathy Stanislaus, Assistance Administrator, Office of Solid Waste & Emergency Response, U.S. EPA, provided the EPA perspective on GSR. He laid out the distinction between green remediation versus sustainable development, emphasizing that it is essential to move forward with a clear understanding of what GSR is and is not.

Green remediation serves to reduce global impacts like pollution and greenhouse gas emissions as well as localized impacts, for example through the use of lower emitting fuels and implementation of dust control strategies. A focus on green remediation emphasizes meeting core cleanup responsibilities and then optimizing the cleanup.

EPA's first GR guidance document was published in 2009 to establish principles, and since then a number of technical documents, including best management practices (BMPs) and a footprint analysis tool, have been published.[4] The challenge for EPA and other proponents of green remediation is how to implement it systematically. ASTM's recent work is an essential step in the right direction. Mr. Stanislaus requested input on strategies that EPA could contribute to for having the ASTM standard[5] systematically applied across the board.

Mr. Stanislaus noted that in any effort to systematize GR, tradeoff conversations ought to be avoided. GR strategies must not undermine core cleanup requirements including the essential responsibilities of a timely and protective cleanup. In some cases, arguments for long-term natural attenuation have been made in a green remediation context or cleanups have been delayed due to GR conversations. The approach Mr. Stanislaus would like to see is one where National Contingency Plan (NCP) criteria are met, a timely decision for a timely cleanup is made, and cleanups are then optimized on top of that.

Mr. Stanislaus pointed out that there are many opportunities to optimize cleanups, which can often be identified by better connecting the investigation side with the remedy side of the cleanup. Furthermore, EPA sees lots of opportunity to improve efficiency of groundwater cleanups. EPA recently issued its *Groundwater Remedy Completion Strategy*, looking at efficiencies and examining how individual geological circumstances inform cleanup goals and actions.[6]

The sustainable development aspect is a distinct, community-driven process that looks at local land use. EPA has partnered with organizations and other agencies aiming to align resources for sustainable community planning efforts such as the Department of Transportation's (DOT) Transportation Investment Generating Economic Recovery (TIGER) grants and the Department of Housing and Urban Development's (HUD) Office of Sustainable Communities. Sustainability initiatives aim to take a holistic look at contaminated site cleanups in communities, often focus on a wide area, and use a systematic approach. Mr. Stanislaus mentioned that it is important to delink these concepts from green cleanup concepts, as the leaders and drivers are different.

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[4] EPA's Principles for Greener Cleanups document, published August 2009, can be found at: http://www.epa.gov/oswer/greenercleanups/pdfs/oswer_greencleanup_principles.pdf. Many of EPA's other resources can be accessed at: http://www.clu-in.org/greenremediation/ (GR Technical Primer, Superfund Green Remediation Strategy, Regional Policies, Site Profiles, BMPs, Footprint Analysis Tool, etc.).

[5] ASTM Standard Guide for Greener Cleanups E2893–13□1

[6] U.S. EPA, OSWER, Groundwater Remedy Completion Strategy: Moving Forward with the End in Mind, May 2014, http://www.epa.gov/superfund/health/conmedia/gwdocs/pdfs/EPA_Groundwater_Remedy_Completion.pdf

Mr. Stanislaus' closing remarks highlighted two major EPA initiatives. EPA has undertaken major steps to ensure that local communities partake in cleanup, recovery, and end use of the site. For instance, the job-training program now in place, which began in response to criticism about the number of jobs during a site cleanup that went to outside contractors, is now working to bring more of these jobs to community members. EPA has also sought opportunities to use renewable energy during cleanups or to site renewable energy projects on recovered land through its RE-powering America's Land Initiative in collaboration with the Department of Energy (DOE). Contaminated sites are often uniquely suited to renewable energy projects as they have large capacities for grid transportation, resulting from the grid infrastructure established for the former operation at the site.

Nick Garson, President, Sustainable Remediation Forum (SURF), provided an overview of SURF and its vision for the future of GSR.[7] SURF is an organization, established in 2006, with over 100 members consisting of large site owners, consultants, contractors, government representatives, academics (including four student chapters), and others. SURF aims to advance the science and application of sustainable remediation, develop and share best practices, exchange knowledge, and provide education and outreach.

SURF's value proposition is that, in alignment with organizational sustainability goals, GSR can reduce environmental footprint through timely and protective cleanups that comply with regulations, increase social responsibility and public outreach, and reduce remediation costs and long-term liabilities.

SURF defines sustainable remediation as protecting human health and the environment while maximizing environmental, social, and economic benefits throughout the entire lifecycle of a cleanup. In the past, the focus has been on optimization, but going forward SURF would like to collaborate with other organizations to find ways to consider GSR throughout the entire process of a site cleanup, from facility assessment, through investigation, closure and redevelopment.

SURF started out as a grassroots initiative within the U.S., but it has taken off globally. Numerous tools and guidance documents have been developed to assist users with implementing the concepts. The Interstate Technology & Regulatory Council (ITRC), ASTM, and others have been integral to this process. EPA independent efforts to advance green remediation, including technical bulletins, case studies, guidance documents, fact sheets, webinars, etc. have been tremendous. The tools, guidance, and policy exist; implementation within that context is the next needed step.

Memos of support from EPA headquarters, such as that signed by Mathy Stanislaus in December 2013[8] are instrumental in helping site owners, state regulators, and other parties involved.

Though the success of GSR has been encouraging, domestically and internationally, a number of challenges remain. These include: 1) the need for more case studies; 2) the need for more

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[7] For full presentation, visit: http://www.thehorinkogroup.org/wp-content/uploads/2014/06/Garson-Presentation.pptx

[8] Mathy Stanislaus Memo to Regional Administrators et. al, "Encouraging Greener Cleanup Practices through Use of ASTM International's Standard Guide for Greener Cleanups," U.S. EPA, 23 Dec 2013, http://www.epa.gov/oswer/greenercleanups/pdfs/oswer-aa-gc-memo_december-2013.pdf

training, education, and awareness; 3) perceptions that GSR means doing less cleanup; 4) the need for improved and expanded metrics particularly on the social and economic side; 5) misconceptions about increased cost; and, 6) insularity of government cleanup programs.

Mr. Garson suggested for a possible cross-program vision for GSR that could offer guidance and direction for all federal programs. Ideally, it would encompass all of EPA's cleanup programs (UST, Federal Facilities, RCRA, Brownfields, and Superfund) in addition to DOD, DOE, and any other federal agency cleanup programs. This should consider how to incorporate the societal and economic aspects currently being addressed through other programs or other parts of these programs. Further recommendations for future actions included celebrating GSR successes, acknowledging project managers, site owners, and communities, more frequently. Publicizing the good work being done across different regions would help to carry the momentum of GSR. Mr. Garson highlighted EPA Region 7's use of the Leading Environmentalism and Forwarding Sustainability Award (LEAFS) and shared a video produced by EPA that celebrates the revitalization of a Superfund site in Olathe, Kansas.[9] Expanding to a region-wide recognition program for GSR implementation would send a positive message and could create a stronger incentive to advance GSR practices.

Mr. Garson noted that SURF hopes to collaborate further with the organizations represented around the table and explained that the ultimate goal would be for GSR to become business as usual for contaminated site cleanups in the future.

Discussion Overview

Ms. Horinko noted that the current conversation around GSR and the differing interpretations today is very much reminiscent of the early days of the Brownfields program when parties were struggling to define cleanup terms. Over time the concepts defined under Brownfields became vital to other cleanup programs, such as active revitalization under RCRA and UST. Concepts that were a good idea naturally spread across cleanup programs, as could be the case with GSR. Ms. Horinko turned to a presentation on the topic of GSR concepts and definitions.

Buddy Bealer, Director, Sustainable Remediation Initiative (SRI), presented on some of the definitions, concepts, and frameworks for GSR.[10] He outlined SURF's definition of sustainable remediation (SR), EPA's definition of green remediation (GR) and ITRC's definition of green and sustainable remediation (GSR), noting that if any one of those definitions is applied, the result is usually a more efficient and effective remedy.

A sustainable remedy would aim to satisfy all three aspects of sustainability: 1) environmental; 2) social; and, 3) economic. A graphic of an exponential decay curve was presented to illustrate the decline in return (measured in decrease in contaminant concentration) on the investment of

[9] The video detailing this effort, *Plants, People, Pollinators Environmental Education and Stewardship Chemical Commodities, Inc. Superfund Site in Olathe, Kansas*, portrayed the success story of a cleanup where the end goal was identified early on with input from community stakeholders. With the end goal in mind, the remediation process developed, and the result was a sustainable, timely cleanup that benefited the community and was collaborative throughout. The success was recognized with the LEAFS award, which was developed and presented by EPA Region 7. The video can be accessed at: http://www.epa.gov/superfund/programs/recycle/info/chemicalcommodities.html

[10] For full presentation, visit http://www.thehorinkogroup.org/wp-content/uploads/2014/06/Bealer-Presentation.pptx

time, money, and effort during a cleanup. SR aims to find the optimal point where benefits are maximized and cost is minimized.

Mr. Bealer pointed out that SR differs from sustainable development in that it is a holistic approach to the cleanup process that is flexible, scalable, site specific, and performance based. It is not simply the redevelopment of a property. Furthermore, it is not an entirely new concept, nor is it a technology. It is not an excuse to do nothing, and it is not prescriptive. Above all, human health and the environment must be protected and compliance must be achieved.

SR can be represented as an approach to a complex problem. Users of SR are encouraged to bring key stakeholders to the table and consider all of their concerns, ideas, and solutions from the outset—to put all the issues on the table at the same time. Frameworks exist to assist users with this process. Most of these have common elements: 1) select appropriate stakeholders; 2) define project's current status (in remediation terms this would be the conceptual site model); 3) choose project goals, metrics, and tools from the start with the end in mind; 4) evaluate options for the project using metrics and tools chosen; and, 5) select most appropriate option, then document and monitor as implementation proceeds.

SRI promotes the use of the ITRC's GSR 2 framework.[11] The robust process used to develop it was a three-year multi-stakeholder process. The framework includes three levels for GSR implementation: level 1) offers BMPs and guiding strategies; level 2) uses a simple qualitative and/or semi-quantitative evaluation; and, level 3) offers a more rigorous quantitative evaluation. A number of other tools have been developed that fit into or supplement the ITRC framework. These include EPA's Spreadsheets for Environmental Footprint Analysis (SEFA), the Air Force's Sustainable Remediation Tool™ (SRT), and the Navy/Army Corps of Engineer's SiteWise™ tool.

Moderated Discussion – Session 1

Part 1 – How is GSR being incorporated into our programs and activities?

The moderated discussion led off with participants reflecting on how and to what extent GSR is being incorporated into their respective programs and activities. One participant noted the important distinction between programs in which GSR is implemented and enforceable and those where GSR is voluntary and is driven by corporate sustainability goals. GSR is being implemented to a varying extent at the federal and state level, but there is much energy devoted to GSR across the board. Tools and guidance are adequate and thorough[12]; deploying these resources into real action on the ground, enforceable or voluntary, has been a bit harder. Many of the ongoing activities in each organization are set out below –

- Within the Department of Defense (DOD), discussions began around 2010 about looking for efficiencies in remedies. A policy was later set requiring green or sustainable options to be considered as remedies are selected. This might be accomplished by, for instance, bringing a construction contractor into the process early on, so that the decision maker can understand whether the remedy is efficient, as they weigh the nine criteria[13]. For

[11] ITRC's Green and Sustainable Remediation – A Practical Framework, published November 2011, can be found here: http://www.itrcweb.org/GuidanceDocuments/GSR-2.pdf
[12] One participant noted that the available tools for the economic and social impact categories are less developed than for the environmental impacts.
[13] EPA's Nine Criteria: http://www.epa.gov/superfund/cleanup/analys.htm

example, in the Superfund process, GSR considerations should be weighed as one looks at the nine criteria and selects the remedy with the aim of reducing the remedy's footprint. DOD policy states each Component should consider GSR as they develop remedial activities. Furthermore, DOD policy leaves open the option for further optimizing remedies during the five-year review process.

  - The Naval Facilities Engineering Command (NAVFAC), which operates the Navy's Environmental Restoration program, requires that the SiteWise model be employed during a Feasibility Study. Likewise, the Air Force uses the SRT.
  - The U.S. Army Corps of Engineers (Corps) has studied the Army, National Guard, Army Reserve, and Base Realignment and Closure (BRAC) facilities looking at GSR metrics and how they are progressing. Some of the Corps districts are including GSR language in contracting documents, though currently this is done on an inconsistent basis.

- EPA Region 10 Clean and Green Policy, which encourages practitioners to consider greener options during cleanups, was included in a CERCLA consent decree related to stormwater management. The criteria in the consent decree were based on EPA Region 10's Policy, including mandating the recycling of materials and reuse of equipment. This was EPA's first attempt at incorporating GR into a consent decree.

- In EPA's Superfund program, GR approaches that incorporate footprint evaluations require the stakeholders to consider questions that are not traditionally asked about a remedy. Within the nine criteria, there is a lot of room for basic GR concepts to be further incorporated. The social and economic aspects are already considered through the Superfund criteria and in other initiatives under Superfund. For instance, the Superfund community involvement handbook is at least 100 pages worth of guidance related to social aspects of the cleanup.

- EPA's Underground Storage Tank (UST) program has aspects of GSR in their work, but is not formally implementing any guidance or standard. This is partly because the program operates by distributing money to the states and territories in support of approximately 75,000 sites. The role of EPA UST program has been to share information, encourage best practices, host conferences and workshops, and therefore the role of the UST Headquarters Office in encouraging GSR would look different than other EPA programs, which are closer to the actual cleanup. The best lever in their experience has been to share successes to best help everyone to move forward. Social aspects and site redevelopment have been a major focus of their petroleum brownfields initiative.

- In EPA's Brownfields Program, the grant competition managers have considered how to incorporate GSR concepts into grant applications. Given the many requirements and strings attached to the existing application, however, it is not likely a viable option to include GSR as an additional requirement. In considering the addition of a "No Idling" term and condition to cleanup cooperative agreements, there was great deal of push back and the Program staff also realized that the enforcement of such a condition would be problematic. Right now highlighting best practices and encouraging GSR is ongoing and may be the most viable areas for improvement.

- At the state level, there are all sorts of policies and guidance at varying levels that encourage GSR, but are not requirements. Under this framework, GSR is proceeding in

a patchwork manner, but is occurring to some degree. There are some contract language requirements, but a top down edict – offering staff, database, and technology resources to handle the information collection, storage, management, and analysis – would make implementation much more successful. Database uniformity across states would streamline remediation management.

- ITRC has conducted a number of internet-based trainings on their guidance document through EPA's CLU-IN website. This training will continue this year and potentially into 2015[14].

- Many Department of Energy (DOE) personnel attended a teleconference presented by ITRC and demonstrated much interest. DOE has also written up contractual language for the performance piece of the contract and has come up with a graded system for implementation: 1) qualitative and easy to implement 2) semi-quantitative takes a bit of effort 3) quantitative (using SiteWise or otherwise). Stakeholders have responded positively to this sort of guidance. DOE also has formed a small workgroup with representatives from legacy management, general counsel, field offices, and others, attempting to simplify the definition and develop products to help project managers in the field understand.

Part 2 – What are some challenges/opportunities for better implementation?

Participants shared ideas on what they saw to be challenges or barriers to the implementation of GSR. Challenges ranged from: 1) communication, perceptions, and understanding of GSR; 2) enforcement issues, jurisdictional limitations, and creative ways to work around them; 3) definitional complexity, discrepancies, and how to move forward given the current distinctions; and, 4) resource needs for implementation including for data collection and management. Opportunities and needs discussed include case studies; celebrating successes; education and communication; and rewards and incentives.

Participants also noted important avenues for advancing GSR, including: 1) the next wave of students graduating with an eye toward sustainability; 2) the federal government as the largest remediation service consumer; and, 3) companies adopting corporate sustainability programs and goals.

The following paraphrases the challenges discussed, many of which present opportunities for action, along with opportunities for future progress:

<u>Challenges</u>

- At a high level within EPA, DOD, and DOE there is general acceptance that GSR is positive for cleanups, though definitions still need to be sorted out; the push back often comes at the regional, state, and local level. Culture, lack of communication, perception that GSR is more work, lack of understanding of how to do an evaluation, and the notion of a less rigorous cleanup, could all be potential barriers.

[14] ITRC training can be accessed at: http://www.itrcweb.org/training#GSR

- GR is within the jurisdiction of the cleanup programs as they are currently set up; however, depending on how sustainability is defined, it may not be enforceable. A considerable alternative is, a company approaching EPA with a plan to meet the CERCLA nine criteria, but also to consider a number of additional sustainability measures that could be written into a consent decree.

- ITRC is aiming to address training, education, and awareness challenges. This training is aimed at state regulators, and although many regulators have been trained, further education and training is still needed. ITRC would like to identify other ways to get the word out as well. More follow up to investigate if and how the training is being implemented would also be beneficial.

- The definitional discrepancy between GR, SR, and GSR is an issue, as inconsistent messaging can be confusing. Regulatory programs across the country will mimic EPA. Therefore, EPA might want to highlight what their sustainability efforts within the cleanup program are, if indeed these are ongoing and distinct from GR practices. From a public relations perspective, it disadvantages EPA to have stakeholders think that sustainability is not a part of EPA cleanup programs. EPA and SURF might both consider how to make their approaches more flexible. In all, consistent messaging would aid implementation.

- Following ITRC's presentation to DOE, many in the room were still confused about the definition of GSR. A simplified definition could be helpful. One participant offered such a definition: *GSR is remediation done smarter, cheaper, and by talking to everyone around*.

- Resistance at DOE has come from objection to the upfront cost of running tools and analytics like SiteWise. There is also a lot of opposition to having a third party provide site visits to evaluate the contractor conducting the cleanup.

- Participants expressed that if GSR is seen as just one additional requirement, it is not likely to happen voluntarily. Without a regulatory requirement, the only way to get the attention of practitioners is to stress the cost effectiveness of the approach. However, in many instances, GSR is already happening, yet not being called to attention or recognized in such terms. Pointing out these instances to raise awareness and understanding of the practices is essential.

- State level push back comes in many different forms, including staff that will not make time for GSR because there is no mandate. If it were required as part of day-to-day work, it would be implemented readily. There is also push back at a mid-manager level because they argue there is no appreciable change in the decision making process. Though the impacts may not be massive, the accumulation of benefits over time is significant with regard to the environment and cost. A top-down edict would make this straightforward to implement. A clear demonstration that GSR does not impede the cleanup timeframe would also result in more support.

- A greener cleanups group within ASTSWMO conducted a survey of the states and territories on the obstacles to GSR implementation. The greatest obstacle was identified as lack of knowledge/awareness. This was also identified as the easiest obstacle to overcome.

- DOD Remedial Project Managers have encountered issues with receiving EPA approval for GSR-type remediation. The EPA has pre-prescribed types of remedies that would normally be applied to specific site types. The ten EPA Regions also have varying approaches; some look favorably on GSR, while others do not. Acceptance and common messaging from the regulators is crucial. State led cleanups have been more successful. In many cases, analysis with a contractor can be explained to the state, and remedy decisions are often favorable of GSR.

- Barriers to implementation go two ways; in some cases the issue is getting Responsible Parties to do SR, and in others, Responsible Parties want to do SR, but can't due to push back from regulators.

Opportunities

- DOD created a sustainability analysis for its acquisition process. The first part involved Life Cycle Analysis for long-term impacts. The second part was Life Cycle Costing for the alternatives. This also included monetized impacts, providing the decision-maker two views of the alternatives: long-term impacts and related life cycle costs. DOD has developed a very simple tool to do this. The system boundaries need to be carefully selected and applied, but this is a type of approach that could be very effective within the remediation industry.

- When the "No Idling" policy was included as part of the Region 10 consent decree, it made a big difference for the site manager who previously could not convince his employees to comply with suggested policy. Having an authoritative requirement enabled him to get employees to comply and saved the company money. If a company owner is convinced that these practices have value, they may self-police and not require agency enforcement.

- Many see GSR as an additional requirement, but it is important to note that it is often already happening, but simply not being referred to as such. These instances should be pointed out. Furthermore, the idea of sustainability needs to be expanded so that practitioners understand that doing remediation projects more efficiently and effectively can contribute to sustainability goals. Sustainability goals are not only met in areas outside of remediation.

- DOE had a sustainability award, which helped to bring in case studies of GSR cleanups as people were submitting nominations that followed GSR concepts, despite not referring to them as GSR.

- It is critical to tie in considerations of cost to motivate the field to pay attention without an enforceable policy, or "hammer". Many in the field are closed off to "green" ideas, so instilling financial terms is essential. The DOD sustainability analysis is one example of how to do that. In that case, three types of costs – internal, external (societal), and contingent – were compared. This type of analysis would make GSR relevant in financial terms. In DOE's sustainability awards program, applicants were required to note cost savings, which opened a lot of eyes and ears when shown to others.

- One benefit from considering social cost of environmental metrics, such as the externalities associated with GHG emissions and energy use, in a remedial alternative evaluation is the potential to reduce future costs society (i.e. the government) will be

required to spend on mitigating the environmental and socio-economic impacts caused by those metrics (i.e. impacts due to climate change and a decrease in the availability of natural resources).

- Identifying environmental BMPs for GR is quite straightforward. However, identifying BMPs, especially the top 10 BMPs, for social and economic aspects of GSR, can be a challenge. Montclair University and SURF are putting together a white paper on social aspects of remedial activities. This will bring social sustainability research into the remediation sector and attempt to identify the leading BMPs for sustainable remediation.

- Developing language to encourage the use of GSR is straightforward; however, it would be beneficial if EPA would announce that, if companies or remediators want to propose a sustainable approach that goes beyond compliance, they are encouraged to do so.

- The biggest buyer of remediation services is the federal government. If a process were developed to work with government contractors on implementing GSR, that would change the industry. A requirement related to GSR for federal sites would be a powerful driver for change.

- From an academic perspective, a new generation is being educated with sustainability as a core concept across many disciplines. Some schools aim to incorporate sustainability across their entire curriculum. Penn State University and Montclair State University are such examples. In the future, as individuals trained in sustainability become project managers, hydrogeologists, government employees, etc. there may be less push back against these concepts. SURF is working to engage the academic community to further incorporate GSR into their programs.

- Companies are adopting sustainability programs based around the "business case for sustainability," and often times, these efforts not only save money, but also benefit workers, the community it serves, and the corporation. Expanding sustainability goals to encompass remediation programs (not simply areas like energy efficient buildings) that also receive recognition would be beneficial.

- Case studies that elaborate the cost details and quantify GSR benefits are needed. Many participants reiterated the need for more case studies in general.

Case Study Presentation

Rebecca Bourdon, Hydrogeologist, Remediation Division, Minnesota Pollution Control Agency (MPCA) presented on its GSR initiative, a state-level example of GSR implementation.[15] The GSR definition adopted by Minnesota Petroleum Remediation Program (PRP) is, "Contaminant risk mitigation decision-making cognizant of environmental effects, community goals and economic impacts."

MPCA first developed a toolkit for greener practices in 2002. Without funding, this effort did not gain much traction. Stimulus money for the LUST program gave legs to the GSR initiative in

[15] For full presentation, visit: http://www.thehorinkogroup.org/wp-content/uploads/2014/06/Bourdon-Presentation.pptx

2009, and with this, MPCA developed their own BMPs. Because the cost effect of implementing the BMPs was net neutral, MPCA was able to incorporate these practices into LUST fund-financed contract language in 2010. With input from ITRC, ASTM, and SURF's White Paper and Life Cycle Analysis (LCA) information, Minnesota PRP's guidance was developed for the state LUST program in 2012.

The guidance is purely voluntary and very much evolving. Under the MPCA guidance, case studies are under development and are specific to PRP/Petroleum Brownfields Program (PBP). They will showcase the integration of PRP guidance, ASTM standards, and ITRC guidance.

A PRP GSR evaluation project has been underway since 2013. This consists of training project managers and hydrogeologists on how to conduct a GSR evaluation. The training is completed in three one-hour meetings over the course of two weeks. Staff is taught how to use data, assumptions, and calculations as inputs to calculate an environmental impact number. Site consultants provide a cost estimate for each remedial option, and social impacts are then analyzed qualitatively, often based on information and metrics that are already understood about the site. This process simply ensures that all aspects were considered for all options.

In general, a dramatic change does not result from this process for small petroleum remediation projects; however, taking a more holistic approach ensures that decisions are well informed. In some cases, the evaluation leads to a significantly different remediation. The bottom line – modest savings in environmental, social, and economic impacts on each project become cumulatively important.

Moderated Discussion – Session 2

Part 3 – What actions both public and private can be taken to overcome obstacles and further the understanding of GSR practices?

The discussion turned next to possible actions and collective brainstorming on a path forward. Participants brainstormed how to reach shared goals with differing definitions; how to comprehensively package the GSR message and the efforts underway at federal, regional, and state levels; the pros and cons of further guidance from EPA; and other incentive strategies both for government and private sector implementation. These thoughts and potential actions are summarized and captured below:

- All parties are interested in moving forward on the general concept, but the perceived difference between GR and SR in application has the potential to stand in the way. If SR is already embodied in existing programs at EPA, the question is how to take existing SR and GR efforts and wrap them together to achieve GSR without a major programmatic shift. This is simply a repackaging of what is already underway, and if it could be accomplished, it would advance the dialogue and lead to more consistent messaging and implementation across the board.

- One major difference of opinion is worker safety, and this needs to be addressed head on for the GSR dialogue to progress.

- It would also be useful to think about a "comprehensive package" in terms of federal programs and a federal program vision for GSR that incorporates EPA, DOD, and DOE. This might encompass the goal of bringing GSR principles more systematically to all

cleanup programs beyond just Superfund, including state-led projects, Brownfields, and UST. Having EPA support for incorporating GSR into all of these programs would be very beneficial.

- Due to the distinct difference between the government making the decision to incorporate GSR and the private sector potentially being required to implement GSR, it may be beneficial to advance two tracks: public and private sector. On the public sector side, if government contracts were to have provisions for GSR, this could transform the industry. On the private sector side, since no legal authority exists to order a company to conduct a sustainable remedy, if EPA were to issue policy guidance or a memo that signaled to companies its willingness to look at sustainable remediation proposals, which go above and beyond cleanup requirements, this may provide the private sector the incentivize to do so. Companies are increasingly interested in sustainability and serving the communities in which they operate. Voluntary proposals could in turn potentially become part of a binding consent decree. The end decision remains with the regulators, but such an approach would be low risk to EPA due to its voluntary nature. Under this proposed guidance, social metrics, such as job creation, and broader economic terms would only be considered after compliance with the regulatory criteria.

- EPA must ensure that operationalizing GSR within, or in addition to, NCP criteria does not undercut legal responsibilities. As it relates to sites with multiple potential responsible parties, there exists a risk, as the idea of engagement has become manipulative. To manage this, it's essential to be very concrete about what is and is not meant by GSR. A database of case studies would be an important tool to point to.

- Further EPA guidance has the potential to complicate the existing world of tools, guidance, and standards that surround GSR and potentially undermine state efforts. There are other means for EPA to encourage GSR, including: 1) increasing focus on GSR during the 5-year site review process; 2) demonstrating where sustainability is being incorporated already without rewriting the definition and existing documents; and, 3) use the Brownfields Conference, Federal Remediation Technologies Roundtable, and other workshops as venues for exchanging information, recognizing good work, and spreading the word.

- Standing up a recognition program similar to the privately administered Brownfields award program could be an effective way to raise awareness. One or multiple organizations represented at this roundtable could form a body to administer such an award program.

- EPA could launch a pilot project initiative with specific metrics across different states and regions or involving DOD and/or DOE sites, while also encompassing a recognition program. With the concepts and tools in place, structured incentives are needed. For example, EPA could launch a regional pilot project initiative that would compete for a GSR award. These types of initiatives send a message that the concept is important.

- Outside of the remediation arena, there are all sorts of sustainability standards for products and materials. Remediation projects use hundreds of products, and if there were some sort of sustainability seal or standard for products, contractors could procure these products to advance greener remedies.

- ITRC is working to harmonize guidance adoption across the country, and continues to track which states are using its guidance document in order to develop success stories, but also identify where more work can be done.

- In terms of broadening the sphere of GSR, demystifying and simplifying the concept could go a long way. There are numerous smaller sites beyond Superfund with the potential to adopt GSR, but communication around how GSR approaches can be flexible and adaptable to these types of sites could be improved. EPA UST works with ASTSWMO's Tank committee, but there's also an opportunity to begin engaging with its GSR committee.

- A memo from EPA Headquarters encouraging states to "do more" with respect to GSR would be incredibly useful to facilitate implementation.

- In the future, GSR concepts and communication need to extend beyond remediation and be applied across agency divisions and disciplines. An example was referred to as one state's stormwater division proceeded in their attempt to infiltrate groundwater through underground galleries without considering contamination in the surrounding area and without communicating with the remediation division about how their project might change the hydrology of the subsurface. In a few cases, this would have a major impact on reopening sites and remobilizing contamination. Applying GSR ideas in cross-programmatic ways can help quantify the debate about which option is more sustainable.

Part 4 – What ideas are there for possible next steps?

Possible next steps were then summarized as the group considered how to move forward collaboratively[16]:

- As the role model for the entire remediation industry, EPA has a large role to play in incentivizing and legitimizing GSR. Publicizing case studies and gathering best practices is key, as EPA has done to a great extent already.

- Setting up an awards program was agreed upon as a worthwhile next step for consideration. The Phoenix Awards, presented at the Brownfields Conference and administered as a partnership with EPA, could serve as a template for such an undertaking.

- SURF could take the lead in identifying pilot projects and offered to take on a leadership role in the evaluation process for a GSR award.

- SURF will be considering ways to further advance its work with academia to unify the message around GSR with the next generation of environmental professionals.

- ITRC will continue work to survey the states and could potentially take the lead on identifying a champion for GSR in each region to form a nucleus of GSR supporters.

[16] Note that inclusion of these ideas in the minutes does not imply endorsement by parties attending the meeting.

- Communicating or surveying project managers to specifically identify their perceived and tangible obstacles would help inform the discussion going forward.

- A memo from EPA to emphasize the value of GSR might be a possibility.

- A signal from EPA to corporations (which would also be heard by regional staff) indicating it is worth their while to propose GSR activities would encourage corporations to be more forward leaning and would help the remediation sector integrate into larger corporate sustainability goals.

- DOD and DOE are both interested in further collaboration. Many DOD components are attempting to do more efficient cleanups; they are not looking for "the easy way out". DOD has a number of good case studies that it could share more broadly. In Region 9, Navy and Air Force signed an agreement with EPA to look at GSR, the findings of which were presented at the Battelle conference. Sharing this example would be useful.

- EPA intends to draft a straw man document to be further fleshed out with the roundtable participants.

Additional topics for future discussions were identified, including: 1) beneficial reuse such as clean water generated at cleanup sites; and, 2) climate change issues including how remedial sites will have to withstand climate shifts in the future and how GSR fits into the climate change prevention and adaptation discussion – adaptation and resiliency are front and center for many regulators, so a cross-programmatic discussion is needed.

Wrap Up

Ms. Horinko wrapped up the discussion by reiterating the concrete action items and summarizing the discussion more broadly. She indicated that the first step was for EPA to consider the day's discussions and potential activities, as well as for SRI to gather and do the same. A joint sharing of straw documents could broadly layout what might be possible. From there, the group could explore how to formalize a path forward that can draw on a much larger stakeholder participation, or how to move forward on any number of individual actions, such as creating a GSR award, undertaking pilot projects, identifying regional champions, or otherwise, depending on where the group sees the most value added. Another immediate next step for all participants was to look for champions within their respective organizations who have been innovators and tend to look for flexible and creative approaches, as well as spreading the word at upcoming conferences and forums.

APPENDIX I – AGENDA

8:45 – 9:00am **Registration**

9:00 – 9:15am **Welcome and Introductions**

Marianne Horinko, President, The Horinko Group (Moderator)
- Safety, meeting logistics, discussion norms/ground rules
- Individual introductions with personal hopes for meeting

9:15 – 9:45am **Keynote Speakers (15 min. presentations)**

Mathy Stanislaus, Assistant Administrator, Office of Solid Waste & Emergency Response, U.S. EPA
- EPA perspective on GSR and expectations for roundtable

Nick Garson, President, Sustainable Remediation Forum
- SURF perspective on GSR and expectations for roundtable

9:45 – 10:00am **Discussion Overview**

Marianne Horinko, President, The Horinko Group

Buddy Bealer, Director, Sustainable Remediation Initiative
- Level set definitions and concepts of GSR

10:00 – 11:30am **Moderated Discussion (45 min. sessions)**

1. How is GSR being incorporated into our programs and activities?
    - Objective: share current state of practice of GSR
    - Outcome: common understanding

2. What are some challenges/opportunities for better implementation?
    - Objective: brainstorm challenges preventing better execution
    - Outcome: list of challenges and opportunities

11:30 – 12:15pm **Networking Lunch**

12:15 – 12:30pm **Case Study Presentation**

Rebecca Bourdon, Minnesota Pollution Control Agency
- MCPA GSR Initiative

12:30 – 2:00pm **Moderated Discussion (45 min. sessions)**

3. What actions both public and private can be taken to overcome obstacles and further the understanding of GSR practices?
    - Objective: brainstorm solutions to challenges
    - Outcome: develop possible actions that can be taken

4. What ideas are there for possible next steps?
    - Objective: discuss how we can work together
    - Outcome: develop plan and commitments to move forward

2:00 – 2:15pm **Take-Aways & Wrap Up**
Marianne Horinko, President, The Horinko Group

APPENDIX II – PARTICIPANT LIST

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API Energy

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Director
Sustainable Remediation Initiative (SRI)

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