

Green and Sustainable Remediation (GSR)

RMEHS Peer Group Q3 2019



Antea®Group

Understanding today.
Improving tomorrow.

Introduction



- BS Biosystems Engineering
- MS Natural Resource Stewardship
- Sustainability Practitioner Area Representative at Antea Group
- Secretary of the Sustainable Remediation Forum (SURF) [2017-2018]
- Sustainability Professional within Oil & Gas [2013- present]



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Accreditations and Qualifications



1 of only 2 U.S.-based CDP Accredited Water Consultancies and a founding partner in the CDP Water Program



Multiple year GRI Gold Community Member and GRI Reporters' Summit sponsor; GRI Standards-certified team members



Founding Sustainability Accounting Standards Board (SASB) Advisory Partner and member of the SASB Standards Advisory Group (SAG)



Co-founder and facilitator of the Driving Sustainable Decisions Working Group



Founding member and working group facilitator of the Ellen MacArthur Foundation Circular Economy 100



Facilitator of the Beverage Industry Environmental Roundtable (BIER) since inception in 2006



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Agenda

- Sustainability in Oil and Gas
- Introduction to GSR
 - Regulation History
 - Definitions
 - Principles
- “Green” Versus “Green and Sustainable”
- Three Pillar Approach
 - Environmental Aspects
 - Social Impact Categories
 - Economic Metrics
- Case for Action



Sustainability within O&G



- Materiality Assessments
- Performance Data Management
- 3rd party Disclosures
- Annual ESG Reporting



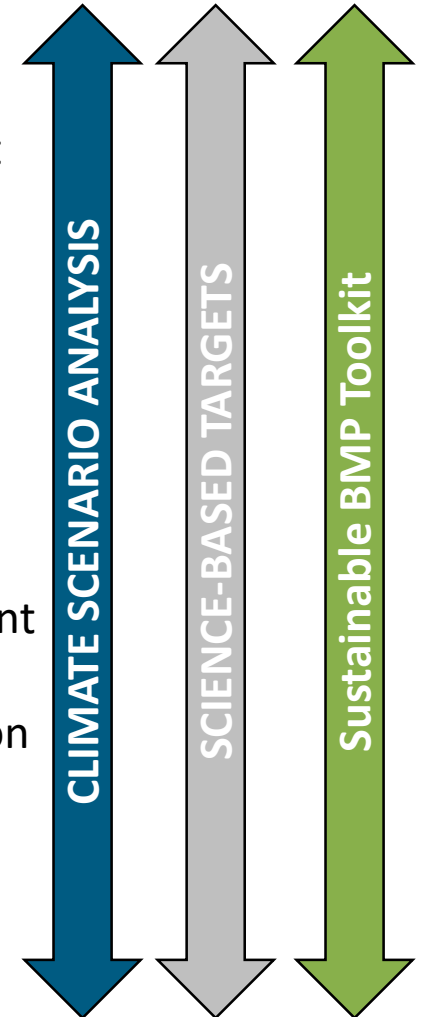
- Basin Collaborations
- Stakeholder Engagement

- Facility Energy Assessment and Engagements
- Sustainable Procurement



- Facility Energy Assessment and Engagements
- Supply Chain Optimization

- Green & Sustainable Remediation



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GSR Resources



- Sustainable Remediation Forum (SURF) framework, guidance, and website
- Interstate Technical Regulatory Council (ITRC) GSR Overview and Framework
- ASTM Standard Guide for Incorporating Sustainable Objectives Into Cleanup



GREEN AND SUSTAINABLE REMEDIATION RESOURCES

- [SURF White Paper](#)
Sustainable Remediation Forum (SURF), "Integrating sustainable principles, practices, and metrics into remediation projects", Remediation Journal, 19(3), pp 5 - 114, editors P. Hadley and D. Ellis, Summer 2009.
- [Green and Sustainable Remediation: State of the Science and Practice](#)
ITRC Guidance Document to help educate and inform state regulators and other stakeholders in the concepts and challenges of GSR (May 2011).

SITE RESOURCES

- [news](#)
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- [- remediation resources and guidance](#)
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Green and Sustainable Remediation

When decision makers consider environmental, social, and economic factors throughout a site remediation, they can lessen negative effects of the cleanup, protect human health and the environment—and still meet regulatory objectives. The consideration of these factors is termed "Green and Sustainable Remediation" (GSR). GSR is defined as the site-specific use of products, processes, technologies, and procedures that mitigate contaminant risk to receptors while balancing community goals, economic impacts, and net environmental effects. GSR has emerged as a beneficial approach that optimizes all phases of site remediation, from site investigation to project closeout.

The ITRC Green and Sustainable Remediation (GSR) team



For questions or additional information, contact itrc@itrcweb.org.



Regulatory History

- Executive Order 13423 (2007)
- US EPA- Green Remediation: incorporating sustainable environmental practices into remediation of contaminated sites
- Executive Order 13514 (2009)
- Department of the Navy Guidance on Green and Sustainable Remediation (NAVFAC) (2012)
- Executive Order 13693 (2015)



Remediation



- Goal: Reduce risks associated with site contamination
- Footprint Effect Challenges:
 - Uses natural resources
 - Generates emissions
 - Can generate waste materials
 - Introduces health and safety risks
- Key Issue: Remediation does not inherently benefit the environment, consequences of remedial actions must be assessed when remedial considerations are made

Differentiating

Remedy Selection

“Green and Sustainable” Remediation

- Goes beyond Green Remediation by incorporating socioeconomic considerations
- The goal is to incorporate all 3 pillars of sustainability (environmental, social, economic) into the entire remedial action process in order to minimize impact and maximize value

Remedy Implementation

“Green Remediation”

- Practice of considering all environmental effects of remedy implementation and incorporating strategies to maximize net environmental benefit
- The goal is not to change the remedy selection criteria or process but to incorporate sustainable BMPs into the process
- Not incorporated into remedy selection

Definition: GSR

Green and Sustainable Remediation:

- The practice of demonstrating, in terms of environmental, economic, and social indicators, that the benefit of undertaking remediation is greater than its impact, and that the optimum remediation solution is selected through the use of a balanced decision-making process (Sustainable Remediation Forum – United Kingdom)

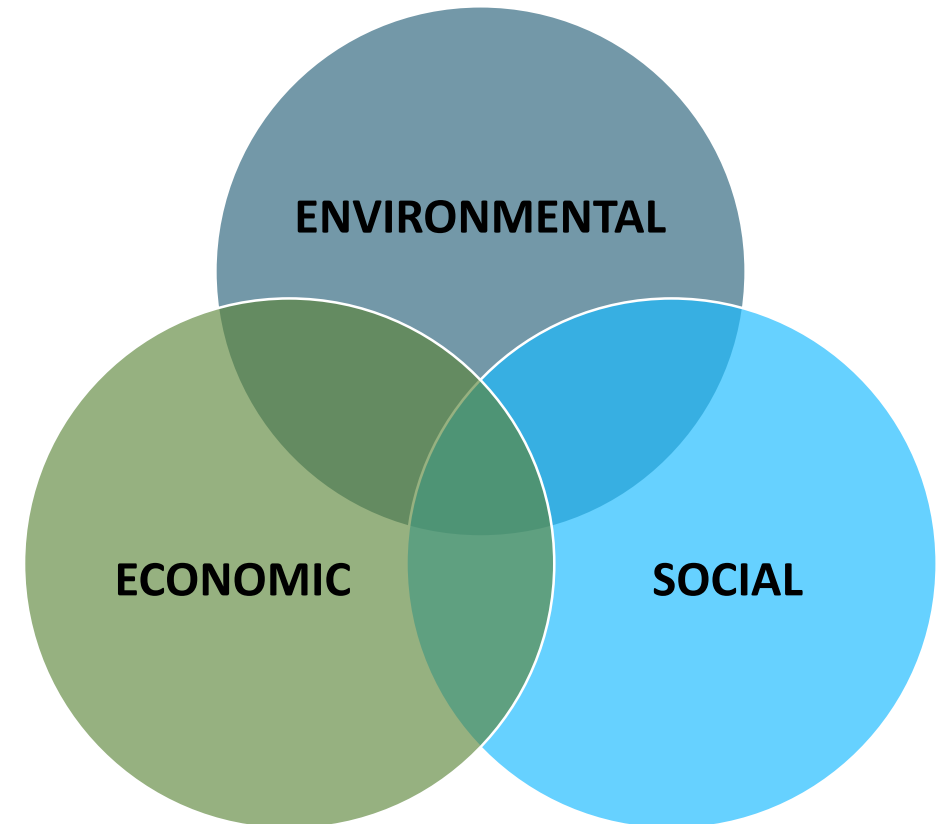


Definition: GSR (cont'd)

GSR – goes beyond traditional remediation...

- Incorporates environmental, social, and economic factors
- Enhances benefits to human health and the environment
- Improves stakeholder engagement
- Identifies and prioritizes stakeholder values, focusing on the most critical for remedial alternative evaluations
- Results in remedial actions that are comprehensive, implementable and effective

Three Pillar Approach



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Environmental Aspects

- Emissions to air
- Releases to water
- Releases to land
- Use of materials and resources
- Use of energy
- Energy emitted
- Generation of waste and/or byproducts
- Use of space



Societal Impact Categories

- Stakeholder engagement
- Health and safety
- Benefits community at large
- Alleviate undesirable community impact
- Economic vitality
- Social justice
- Regional and global societal impacts
- Value of ecosystem services & natural resources capital
- Risk-based land management and remedial solutions
- Contribution to local and regional sustainability policies and initiatives

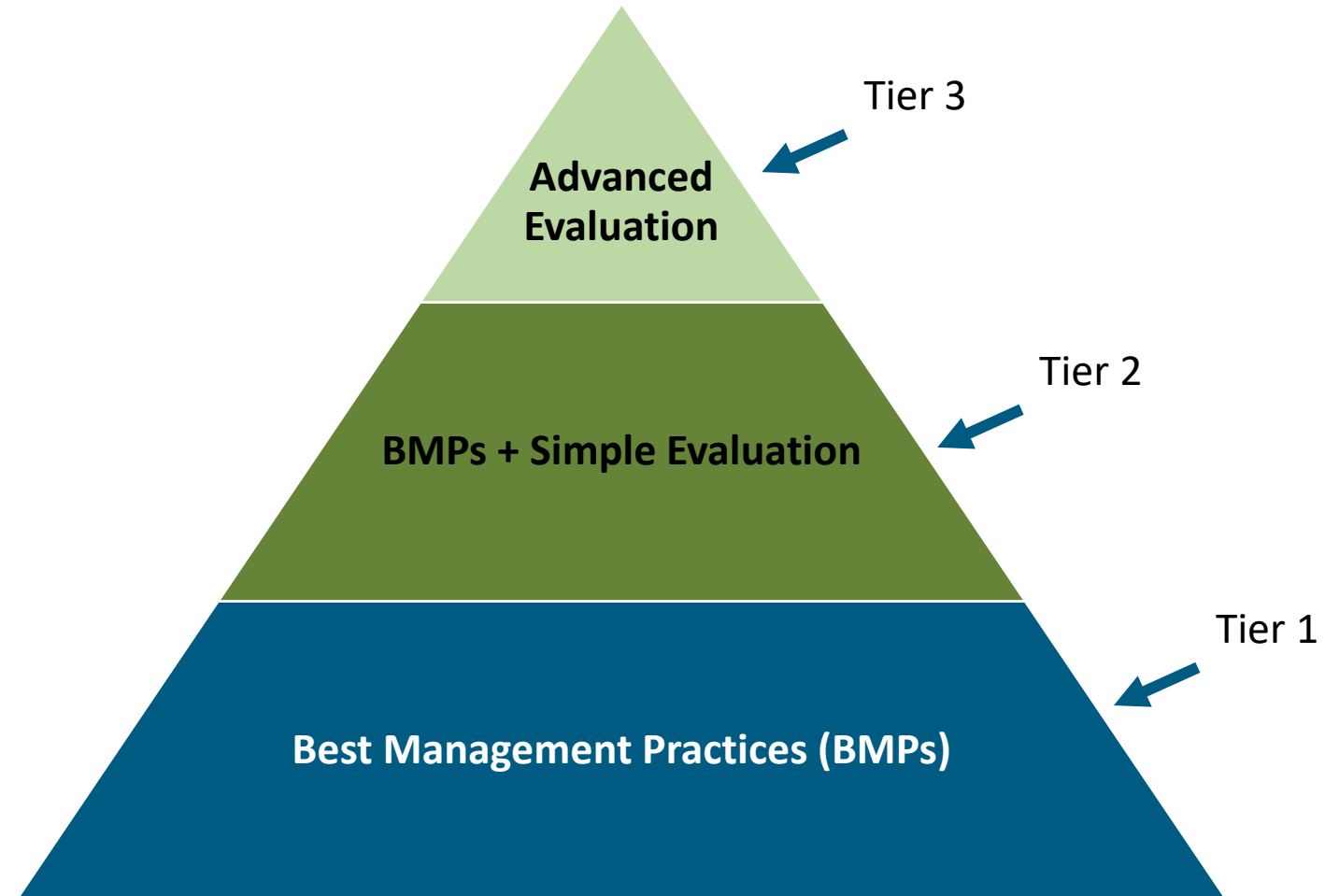
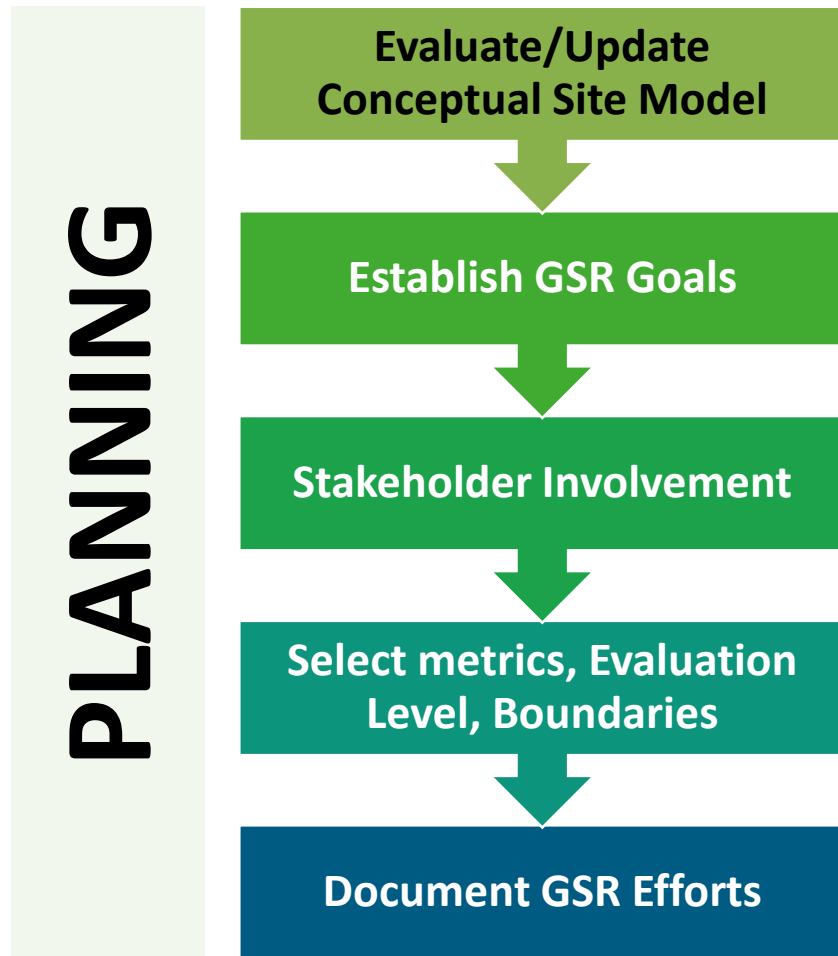


Economic Metrics

- Local job generation/ preservation
- Increased local community prosperity
- Poverty reduction
- Creation of community assets
- Cost effectiveness



GSR Framework Application





Thank you

If you have more questions...

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We do more than effectively solve client challenges; we deliver sustainable results for a better future.



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