Incorporating sustainable development principles in Shell’s soil and groundwater projects

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Sustainable Development and Shell

What does Shell mean by ‘sustainable remediation’?

How do sustainability considerations fit into Shell’s existing risk-based framework for soil and groundwater?

Implementing Sustainable Remediation in Shell
Shell has made clear and long-standing sustainable development commitments.

Sustainable Remediation is consistent with these principles for S&GW activities:

- incorporates Economic, Environmental and Social factors;
- balances short-term and long-term issues in decision-making

Shell has implemented Sustainable Remediation through its global Downstream SGW programme effective January 2012

Able to demonstrate more sustainable remedial solutions applied

Drives innovation
Our commitment to sustainable development

- For us, sustainable development means helping meet the world’s growing energy needs in economically, environmentally and socially responsible ways.
- This includes the choices we make about our portfolio and products, and the way we run our operations.
- We included our commitment to contribute to sustainable development in our Business Principles:

  - "Long-term profitability is essential…"
  - "…balancing short and long term interests…"
  - "…integrating economic, environmental and social considerations into business decision-making…"
  - "…reduce the environmental impact of our operations, products and services…"
  - "…be good neighbours… manage the social impacts of our activities… enhance benefits to local communities…"
  - "…regular dialogue and engagement with our stakeholders is essential…"
The Shell DS SGW Vision and Mission

Vision

No harm to people, protecting the environment through **sustainable**, risk-based approaches, based on internationally accepted protocols and procedures.

Mission

- Work with stakeholders to maintain Shell’s reputation
- Ensure best use of financial resources to maintain acceptable risk
- Drive to eliminate liabilities
- Partner with Shell businesses to incorporate soil and groundwater risk management into business activities to eliminate the likelihood of leaks and spills
Sustainable Remediation definition adopted

- ‘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’ [SuRF-UK, 2010]

- Definitions and descriptions developed in the USA (SURF, ITRC), Australia, and Europe (NICOLE) are not substantively different
Sustainable Remediation in the SGW Delivery Model

- Sustainability in Real Estate thinking
- Sustainable and risk-based approach explicit in project goals (E2E plan) to deliver the business objectives
- Sustainability factors considered in design and selection of site characterisation methods
- Include sustainability considerations in remedial strategy selection

Diagram:

1. Site Identified
2. Perform Phase I Investigation
3. Define Impact (Phase II Investigation) & Perform SET Evaluation
4. Assess Need for Remediation
5. Remedial Alternatives Analysis

- Review sustainability appraisal with ES COE
- Complete Feasibility Testing
- Remediaiton Action Plan (RAP)
- Consider sustainability factors in remediation design
- Complete Detailed Remediation System Design
- Monitor Remedy Performance
- Install / Initiate Remediation
- Closure

- Collect sustainability data to support closure strategy
- Verify Sust Rem appraisal. Learn and share lessons
- Sust Rem appraisal reported in RAP
Approach to implementing Sustainable Remediation

- Apply Best Management Practices to all projects (Tier 0)
    - Site characterisation (e.g., drill in safe locations; minimise multiple mobilisations)
    - Remediation operation (e.g., avoid plant idling; treat and reuse excavated soils; limit vehicle movements through residential areas)

- Sustainability appraisal to:
  - Select best strategy to meet business objectives
  - Select best remedial technique to deliver remedial strategy

- Adopt tiered sustainability appraisal framework (Tier 1 – 3).
  - Supplements existing risk-based assessment and management
  - Incorporate into the existing SGW Delivery Model (Horseshoe)
  - KEEP IT AS SIMPLE
Tiered approach to SR appraisal

Possible application to projects

Complex refinery project

Complex retail site, typical manufacturing site project

Typical retail site project

All projects

Tier 0 Best Management Practices (BMPs)

Simple Tier 1 qualitative appraisal

Tier 2 semi-quantitative appraisal

Complex quantitative appraisal

Example: Cost-Benefit Analysis

Example: Multi-Criteria Analysis

Example: Qualitative (discussion or simple spreadsheet)

Example: Select from checklist
**Tier 0 – Best Management Practices**

- Checklist of Best Management Practices (BMPs)
- Select and apply *relevant* BMPs in project design and operation

*Example BMPs for soil and groundwater remediation projects*

<table>
<thead>
<tr>
<th>Environment</th>
<th>Society</th>
<th>Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimise CO(_2) emissions – avoid idling of plant</td>
<td>Comply with ‘no harm to people’ and achieve GOAL ZERO</td>
<td>Focus on getting the right solution first time</td>
</tr>
<tr>
<td>Minimise water use</td>
<td>Minimise road-miles driven</td>
<td>Avoid multiple mobilisations</td>
</tr>
<tr>
<td>Re-use excavated soils or secondary aggregates where fit-for-purpose</td>
<td>Direct vehicle movement away from residential areas</td>
<td>Combine remediation works with other earthworks and site development</td>
</tr>
<tr>
<td>Minimise volume of waste sent to landfill</td>
<td>Prevent and/or minimise exposure to noise, dust and vibration</td>
<td>Adopt a sustainable procurement policy</td>
</tr>
<tr>
<td>Proper storage of remediation products / recovered fluids</td>
<td>Minimise disturbance to neighbours, particularly outside normal working hours</td>
<td>Minimise duration of active-remediation. Combine with MNA in treatment-train.</td>
</tr>
</tbody>
</table>
Tiered Sustainability Appraisal (Tiers 1-3)

Start

Review start criteria *

Choose tier

Qualitative
Semi-quantitative
Quantitative

Supports sustainable decision making

Yes

Record assessment outcome and action(s)

No

*Criteria to review:
- Objectives
- Stakeholders
- Boundaries
- Indicators
- Options
- Techniques
- Sensitivity Analysis
- Any other pertinent issues
## Sustainable Remediation Indicator Categories

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Social</th>
<th>Economic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>Human health &amp; safety</td>
<td>Direct economic costs &amp; benefits</td>
</tr>
<tr>
<td>Soil &amp; ground conditions</td>
<td>Ethics &amp; equality</td>
<td>Indirect economic costs &amp; benefits</td>
</tr>
<tr>
<td>Groundwater &amp; surface water</td>
<td>Neighbourhoods &amp; locality</td>
<td>Induced economic costs &amp; benefits</td>
</tr>
<tr>
<td>Ecology</td>
<td>Communities &amp; community involvement</td>
<td>Employment &amp; employment capital</td>
</tr>
<tr>
<td>Natural resources &amp; waste</td>
<td>Uncertainty &amp; evidence</td>
<td>Project life-span &amp; flexibility</td>
</tr>
</tbody>
</table>

[after SuRF-UK, Nov 2011]
Appraisal methods

- Shell does not require its consultants to use a specific model/too1
- Must follow good practice SR framework
- May use new Shell SRAT software
Some Outcomes

- Demonstrably sustainable remedial solutions selected
  - Risk to human health and environment managed with:
    - lower environmental footprint
    - Improved social performance
    - lower cost
- Forces project manager to evaluate project boundaries
  - Challenge arbitrary requirements / constraints
  - Clear, measurable business objectives necessary
- More innovative solutions being considered and applied
- Sustainability considerations being applied within other decision making processes
Conclusions

- Sustainable remediation is consistent with Shell’s corporate approach to Sustainable Development;
- Shell staff & consultants have helped to draft the new international protocols;
- SR supplements (not replaces) the existing risk-based approach;
- Sustainability appraisal should:
  - adopt a tiered approach, using holistic (Env, Econ, Soc) indicators
  - be kept simple.
    - SuRF-UK: ‘Use the simplest tier that produces a robust management decision’
    - Complex SR appraisals only necessary for large and complex projects
    - Should NOT add significant time / cost to most projects
- Across the global portfolio, SR should add value to Shell by:
  - achieving better, more sustainable remediation;
  - encouraging stakeholder (incl. regulatory) acceptance of risk-based solutions;
  - improving Shell’s reputation