SuRF
SUSTAINABLE REMEDIATION FORUM UK

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Sustainable Management Practices for Management of Land Contamination

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This guidance is written by the SuRF-UK Steering Group and is an update on the original publication Sustainable Management Practices for Management of Land Contamination published in March 2014, aiming to bring this 2021 version in line with updated regulatory guidance.

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Executive Summary

The UK Sustainable Remediation Forum (SuRF-UK) was established to develop a sustainable remediation framework that allows assessors to identify remediation strategies and techniques that are more explicitly linked to the goals of sustainable development. The SuRF-UK 'Framework for Assessing the Sustainability of Soil and Groundwater Remediation' was published by CL:AIRE in 2010 with widespread regulatory and cross-sectoral support across the UK.

The SuRF-UK Steering Group has recognised that the same sustainability principles discussed in the framework underpin all aspects of contaminated site management and can be applied across the full range of activities, including those that would not normally have a formal sustainability assessment. Some associated activities, for example site characterisation, are unlikely to warrant a formal sustainability assessment, but the SuRF-UK sustainability indicators can still be used to encourage and promote sustainable thinking, decision-making and action.

SuRF-UK defines Sustainable Management Practices (SMPs) as "relatively simple, common sense actions that can be implemented at any stage in a land contamination management project to improve its environmental, social and/or economic performance". SMPs can be used to improve the benefits (e.g. resource efficiency, community satisfaction) or reduce the negative impacts (e.g. spillages, complaints, cost) of a project, leading to project 'sustainability gains', without requiring a formal sustainability assessment (e.g. SuRF-UK Framework (CL:AIRE, 2010)) at a site-specific level. SMPs may also be used where sustainability gains are sought at a programme of work level using generic criteria or standards that can apply to a range of project types.

This document describes a simple process to encourage sustainable thinking, decision-making and action across all land contamination management activities by using SMPs. It should be used in conjunction with the SMPs spreadsheet available from www.claire.co.uk/surfuk.

Contents

1. Introduction

1.1 Background

The UK Sustainable Remediation Forum (SuRF-UK) was established to develop a sustainable remediation framework that allows assessors to identify remediation strategies, techniques and technologies that are more explicitly linked to the goals of sustainable development. The SuRF-UK 'Framework for Assessing the Sustainability of Soil and Groundwater Remediation' was published by CL:AIRE in 2010 with widespread regulatory and cross-sectoral support across the UK.

In 2020, CL:AIRE published updated guidance to support the use of the framework and the use of indicators/criteria in carrying out a sustainability assessment.

- Supplementary Report 1 of the SuRF-UK Framework: A General Approach to Sustainability Assessment for Use in Achieving Sustainable Remediation (CL:AIRE, 2020a)
- Supplementary Report 2 of the SuRF-UK Framework: Selection of Indicators/Criteria for Use in Sustainability Assessment for Achieving Sustainable Remediation (CL:AIRE, 2020b)
- Supplementary Report 2 - Indicators Appendix 1 (CL:AIRE, 2020c)

The SuRF-UK Steering Group has recognised that the same sustainability principles discussed in the framework and supplementary guidance underpin all aspects of site management and can be applied across the full range of activities, including those that would not normally have a formal sustainability assessment.

The Environment Agency's Groundwater Protection Position Statement (Environment Agency, 2018) promotes sustainable remediation and SuRF-UK's approach, as does the recently published .GOV.UK web page Land Contamination Risk Management (LCRM) (Environment Agency, 2020). The use of Sustainable Management Practices (SMPs) is actively encouraged and emphasises the importance of considering sustainability from the outset of a project.

1.2 Objectives of this document

This document describes a simple process to encourage sustainable thinking, decision-making and action across all land contamination management activities, in particular those that do not necessarily need a formal sustainability assessment.

This document identifies a common set of SMPs that can be widely applied by the land management community. SuRF-UK considers that the SMPs can be used as-developed or further adapted and refined to suit the needs of the practitioner or client.

The SMPs are provided in an Excel spreadsheet file, downloadable from www.claire.co.uk/surfuk. This format means that the SMPs can be readily modified or updated.

1.3 What are Sustainable Management Practices?

SuRF-UK defines SMPs as "relatively simple, common sense actions that can be implemented at any stage in a land contamination management project to improve its environmental, social and/or economic performance". SMPs can be used to improve the benefits (e.g. resource efficiency, cost) or reduce the negative impacts (e.g. spillages, complaints) of a project, leading to project 'sustainability gains', without requiring a formal sustainability assessment (e.g. following a framework such as the SuRF-UK framework (CL:AIRE, 2010)) at site-specific level. SMPs may also be used where sustainability gains are sought at a programme of work level using generic criteria or standards that can apply to a range of project types.

The land contamination management sector has been encouraged in the UK to use a risk-based approach. This is supported by a robust range of standards, codes of practice and technical guidance published by authoritative institutions and organisations. The key principles to be followed are detailed on .GOV.UK LCRM (Environment Agency, 2020).

The SuRF-UK spreadsheet is the first published list of management practices that are mapped against a full indicator set, hence the use of the term 'Sustainable Management Practices'.

1.4 Benefits of Sustainable Management Practices

The benefits to a practitioner and client in adopting sustainable approaches to all activities associated with the management of land contamination include:

- Achieve a reduction in emissions to air, water and land;
- Achieve more efficient use of energy and natural resources;
- Minimise production and disposal of waste, and optimise recycling and re-use;
- Better remediation projects that reduce secondary impacts;
- Achieve or exceed corporate targets and contribute to United Nations Sustainable Development Goals (United Nations, 2015);
- Demonstrate compliance with legal or corporate sustainability policies;
- Save capital and/or operational costs;
- Support local businesses and contribute to local employment;
- Be a 'good neighbour';
- Operate transparently;
- Minimise plant mobilisations;
- Optimise data collection including safe storage/archiving of records and records retention; and
- Integrate remediation works with other activities.

1.5 Report structure

The report is structured as follows:

Chapter 1: Introduction;

Chapter 2: Using the SuRF-UK indicator set; and

Chapter 3: The Sustainable Management Practices process

2. Using the SuRF-UK Indicator Set

2.1 Identifying Sustainable Management Practices

SMPs provide a mechanism to account for the social, environmental and/or economic benefits or detriments of a project. SMPs are not necessarily "new things to do" in addition to standard practice. They do however offer a way of changing behaviours or actions to reduce the cost, use of natural resources and/or the negative impact on a community or the environment.

The actions are mapped against the SuRF-UK indicator categories (CL:AIRE, 2020a-c) to place even simple and low-cost actions in a sustainability context. SuRF-UK's SMPs provide practical and generally inexpensive actions that can yield demonstrable 'sustainability gains' for a company, portfolio specific (series of sites) or an individual project. They should be selected where there is a clear benefit in doing so on a project-by-project basis. The use of SMPs to achieve sustainability gains without formal assessment is similar in concept to the level 1 assessment for green and sustainable remediation described by The Interstate Technology Regulatory Council (ITRC) (ITRC, 2011). How SMPs fit in with the SuRF-UK framework (CL:AIRE, 2010) is shown conceptually in Figure 2.1.

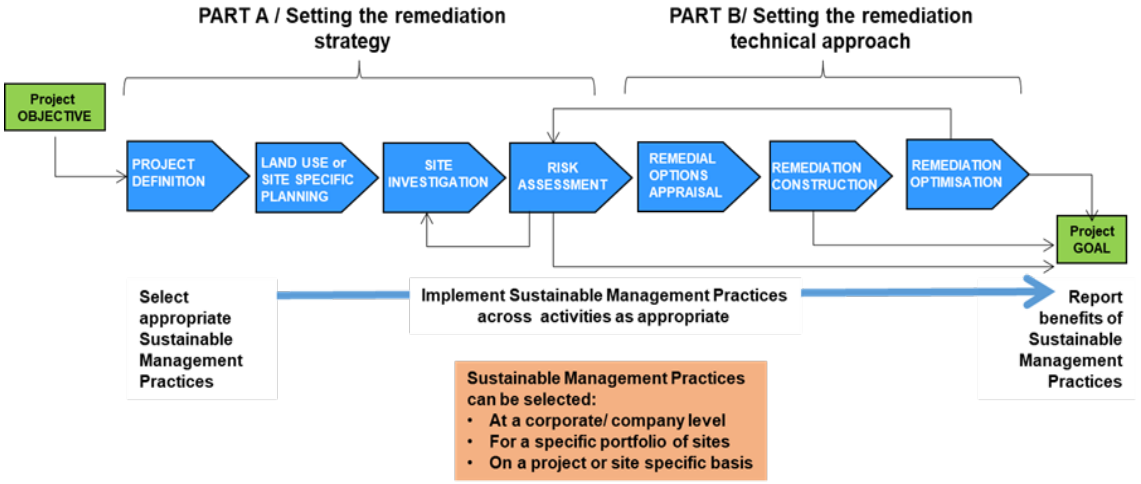


Figure 2.1: Application of sustainable management practices in context of life cycle of land contamination management and SuRF UK Framework

The process taken to develop SuRF-UK SMPs is as follows:

1. Identify actions that may be considered as SMPs;
2. Map SMPs against land contamination management activity;
3. Map SMPs against the SuRF-UK indicator sets.

Further information on how to undertake the mapping process and record results on the SMP spreadsheet is detailed in section 3. The spreadsheet can be sorted by activity and modified by the user to customise to an individual contractor or client's needs. The list of activities is not exhaustive, and people are encouraged to adapt for their own use.

2.2 Mapping Sustainable Management Practices to activities

Most users of this document will be familiar with land contamination management activities but may be less familiar with the SuRF-UK indicator categories. It is therefore likely that practitioners will find it easiest to manage their sustainability 'effects' on an activity-by-activity basis within the context of land contamination management.

The SMPs have been grouped to cover generic management activities and the main stages identified in the UK LCRM guidance (Environment Agency, 2020) as set out in Figure 2.1.

Generic:

- Procurement; and
- Land use planning

Land Contamination Risk Management:

- Risk assessment (primarily site investigation);
- Options appraisal;
- Remediation and verification – Develop a strategy;
- Remediation and verification – Construction and operation; and
- Remediation and verification – Verification and long-term monitoring and maintenance.

These will all be discussed in detail in the sections that follow and identified on the spreadsheet in Appendix 2.

2.2.1 Procurement

SuRF-UK considers it important to increase the sustainability of our actions as early in the process as possible, including through the supply chain. Sustainability can be incorporated into the whole procurement process: defining the need, evaluating options, design and specifying, supplier selection, tender evaluation, post-contract management and supplier development. It gives the client the opportunity to set out their sustainability goals for the project at the outset to ensure that these goals can be reflected in tender submissions.

The SMPs identified for procurement are procedural rather than technical. Most of the procurement SMPs are generic; potentially applying to all indicators. The SMPs will help develop a circular economy, natural capital, and social and human capital throughout the value chain, in line with best practice (Capitals Coalition, 2016, 2019; Department of Food and Rural Affairs (Defra) and Olympic Delivery Authority, 2013).

SMP Example
Set sustainability criteria in the specification to ensure suppliers provide more sustainable products and services.

SMP Benefit
Sustainable procurement helps ensure value for money and lower operational costs whilst protecting the environment and bringing us wider societal benefits.

2.2.2 Land use planning

Land use planning falls under a Stage A assessment identified in the SuRF-UK sustainable remediation assessment framework (CL:AIRE, 2010). This is the project/plan design stage when some of the most influential decisions about the remediation solution can be embedded into a wider sustainable project design, as part of a strategy across a portfolio of sites or a site-specific masterplan (CL:AIRE, 2010). Hence, for a planned development, an optimised remedial strategy can be identified to deliver the required land use.

The SMPs identified for land use planning are strategic and process-related and linked to actions that may contribute to the sustainability of the overall development in the context of the next use of the site.

SMP Example
Plan development layout with regard to breaking pollutant linkages, thus minimising the remediation required.

SMP Benefit
Consideration of land contamination information within regional and site-specific planning provides the opportunity to integrate management of land contamination within the development, either enabling remediation or optimising the amount of remediation required through land use controls.

2.2.3 Land Contamination Risk Management: risk assessment

LCRM states:

> *Depending on the level of risk or regulatory requirements, you can proceed from a preliminary risk assessment to the options appraisal stage. If you proceed direct to the options appraisal stage, you still need to collect the detailed site investigation information required by the generic and detailed quantitative risk assessments. This is to confirm that your approach is viable and acceptable.*
>
> (Environment Agency, 2020).

This is therefore a pre-requisite to remediation and consideration of SMPs and they can be used to reduce the impacts of the project on the environment and local community, engage stakeholders with the project at an early stage, reduce the use of natural resources, reduce production of waste and potentially realise cost savings.

SMPs for risk assessment are primarily based on practical actions to reduce impacts from the site investigation and encourage site-specific risk assessment. A number of resources support these SMPs including BS 10175 (British Standards Institution, 2011) and Pollution Prevention for Businesses (Defra and Environment Agency, 2019).

SMP Example
Consider the use of a mobile laboratory and/or on-site field testing techniques to reduce off-site shipment of samples and improve spatial data.

SMP Benefit
The use of mobile laboratories in the context of a high resolution site characterisation programme has been shown to contribute to a number of sustainability indicators by reducing the need for multiple phases of investigation and associated travel, waste and safety considerations, in addition to developing a robust conceptual site model.

2.2.4 Land Contamination Risk Management: options appraisal

LCRM states:

> *If you have reached this stage, then a decision has been made to remediate. Remediation is the action required to prevent, minimise, remedy or mitigate the effects of the unacceptable risks.*

Then later states:

> *You can consider using a sustainable approach when you select remediation options. Sustainable remediation can provide the opportunity to manage unacceptable risks to human health and the environment. If you use a sustainable approach it can help to ensure that the benefit of doing the remediation is greater than its impact.*
>
> *Consider the relative ability of each option to achieve the remedial objectives in a safe and timely manner whilst optimising the environmental, social and economic value of the work.*
>
> (Environment Agency, 2020).

SuRF-UK recommends that a formal sustainability assessment of remediation options is carried out at this stage (Stage B of the SuRF-UK framework (CL:AIRE, 2010)). The SMPs identified for options appraisal are procedural rather than technical and most are taken from the SuRF-UK framework (CL:AIRE, 2010). Technical SMPs can however be useful as assessment criteria in the tiered assessment process outlined in CL:AIRE (2010, 2020a and 2020b).

SMP Example
Consider a full range of technologies including simple solutions through to emerging technologies. Consider the use of a renewable energy supply to power on-going remedial activities.

SMP benefit
The consideration of a broad range of technologies and 'thinking outside the box' provides the best opportunity to identify the remedial option(s) that provide an overall benefit in terms of the social, environmental, and economic factors.

2.2.5 Land Contamination Risk Management: Remediation and Verification - strategy

LCRM states:

> *The remediation strategy needs to include a clear set of remediation activities and how you will implement and verify them. It is a record of how you will meet and carry out the remediation objectives.*
>
> *It needs to:*
>
> - *clearly set out how the selected remediation option will mitigate the risks from the relevant contaminant linkages identified in the conceptual site model*
> - *meet the remediation objectives and criteria set in the options appraisal*
> - *meet any regulatory requirements – such as to fulfil a planning condition, a Part 2A obligation or to comply with permit conditions*
> - *be compatible with other areas of work such as redevelopment or geotechnical aspects*
> - *state how it will protect human health, the environment, ecology and other receptors*
> - *provide a sustainable approach*
> - *be practical, achievable, effective, durable and verifiable*
>
> *It is important to consider a sustainable approach to remediation.*
>
> *Remediation has the potential to cause environmental, economic and social impacts. You can demonstrate how you have addressed this by showing:*
>
> - *the benefit of doing remediation is greater than its impact*
> - *you have used a balanced decision making process to select the optimum remediation solution*
>
> *The remediation can also have adverse effects on climate change if it is not done correctly. If you select a poor remediation design and implementation, the activities may cause greater adverse effect than the contamination it aims to address.*
>
> *The remediation needs to manage the unacceptable risks in a safe and timely manner. It needs to aim to maximise the overall environmental, social and economic benefits across the whole supply chain.*
>
> (Environment Agency, 2020).

2.2.6 Land Contamination Risk Management: Remediation and Verification – construction and operation

The construction and operation stages relate to implementation of the remediation strategy according to design drawings and specifications and using standard operating procedures developed during the design stage. A number of SMPs are proposed to address practical actions that may be taken in implementing the design to improve the sustainability footprint of the project. Many of the SMPs can be applied at the construction stage even where sustainability has not been previously considered during earlier stages (Constructing Excellence, 2008; Waris *et al*., 2014; Capony *et al*., 2012).

SMP Examples
Don't allow plant and equipment to run unnecessarily (idling). Use technology to drive efficiency during operations e.g. use GPS guided plant.

SMP Benefit
The relatively simple act of implementing a policy to avoid engine idling can reduce fuel and maintenance costs and minimise emissions and noise. The use of technology can have a significant effect across a company-wide portfolio of operations.

2.2.7 Land Contamination Risk Management: Remediation and Verification – verification and long-term monitoring and maintenance

Verification, long-term monitoring and maintenance are grouped as essentially monitoring activities on-site to evaluate whether the remediation was (or was not) successful and continues to perform as predicted. For example, for activities that include monitoring parameters to demonstrate monitored natural attenuation is occurring or the performance of a slurry wall or permeable reactive barrier.

The SMPs refer to actions related to on-going remedial activities, sampling and monitoring procedures, information management and stakeholder engagement. For example, the collection of evidence to support stopping active remediation systems or reducing the number of samples collected and analysed. Adaptive management may be necessary to ensure active remediation processes remain effective. It is essential that good records are kept and that custodians are identified to ensure the records are maintained.

SMP Example
Ensure that remediation information, including the verification report and monitoring data, are securely archived.

SMP Benefit
Linked closely to long term integrity of site and social benefits of clear defensible decision making and regulatory compliance.

2.3 Mapping Sustainable Management Practices to indicators

Mapping potential SMPs against the SuRF-UK indicator sets is considered an important element of this output for a number of reasons:

- Places SMPs in the context of the SuRF-UK framework;
- Enables employees and interested parties engaged in activities a clear indication as to why they are implementing SMPs;
- Provides a clear indication of potential 'sustainability gains' within and across indicator sets, leading to rapid evaluation of potential 'win-win' actions;
- Broadens the application of the SuRF-UK indicator sets; and
- Increases familiarity with the SuRF-UK indicator set within the land contamination sector in the UK.

SuRF-UK has published a list of 15 sustainability indicator categories grouped as environmental, social and economic indicators (CL:AIRE, 2020). These indicators should be used within the SuRF-UK framework for sustainability assessment (CL:AIRE, 2010) in support of remediation decision-making. This is the indicator set that will be referred to throughout the remainder of this document.

2.3.1 Environmental indicators

The five environmental indicators are shown in Table 2.1. SMPs may be used to generate the potential benefits such as those identified in the table.

Table 2.1: Illustrative examples of environmental criteria applicable to the SuRF-UK indicators.

Indicator	Description	Potential benefit examples
ENV 1	Air	Reduce CO_2 emissions Reduce other gaseous emissions (e.g. NOx, SOx, VOCs) Reduce particulate emissions (PM2.5, PM10)
ENV 2	Soil & Ground Conditions	Minimise emissions to soil Improve soil function
ENV 3	Groundwater & Surface Water	Prevent leaks and spills Minimise release of contamination by leaching Prevent cross-contamination in boreholes
ENV 4	Ecology	Maintain or improve biodiversity Control or eradicate invasive plants
ENV 5	Natural Resources & Waste	Reduce water use Reduce natural resource use Reduce fossil fuel use Reduce waste production Increase waste recovery

2.3.2 Social indicators

The five social indicators are shown in Table 2.2. SMPs may be set to address the potential benefits such as those identified in the table.

Table 2.2: Illustrative examples of social criteria applicable to the SuRF-UK indicators.

Indicator	Description	Potential benefit examples
SOC 1	Human Health & Safety	Safe working practices
SOC 2	Ethics & Equity	Regulatory compliance Community involvement Equality impact assessment
SOC 3	Neighbourhood & Locality	Minimise impacts on amenity (e.g. dust, odour, noise) Minimise traffic & disruption, particularly in residential areas
SOC 4	Communities & Community Involvement	Effective communication with local community Stakeholder engagement in decision-making
SOC 5	Uncertainty & Evidence	Optimised data collection

2.3.3 Economic indicators

The five economic indicators are shown in Table 2.3. SMPs may be set to address the potential benefits such as those identified in the table.

Table 2.3: Illustrative examples of economic criteria applicable to the SuRF-UK indicators.

Indicator	Description	Potential benefit examples
ECON 1	Direct Economic Costs & Benefits	Reduce cost, avoid wastage Optimise data collection Getting the right solution first time
ECON 2	Indirect Economic Costs & Benefits	Regulatory compliance Safe working practice
ECON 3	Employment & Employment Capital	Skills & training Local employment
ECON 4	Induced Economic Costs & Benefits	External economic benefits
ECON 5	Project Lifespan & Flexibility	Climate change mitigation Long-term institutional control

Further information of multiple examples of wider contaminated site project impacts across each of the 15 categories is available in Bardos *et al*. (2020).

3. The Sustainable Management Practices process

3.1 The process

The use of SMPs is not intended to be a complex or time-consuming activity and the following sections set out a simple step-by-step process with key questions that should be asked. It is additional to, and synergistic with, sustainability assessment, for example to choose between project design or remediation options as set out in the 2020 Supplementary Reports 1 and 2 (CL:AIRE, 2020a, b). However, the SMPs can also be used on a self-standing basis, whether or not option appraisal is taking place, and across all stages of site management from site investigation through remediation to verification.

Figure 3.1 shows a summary of the process and the main steps are expanded on in the sections that follow.

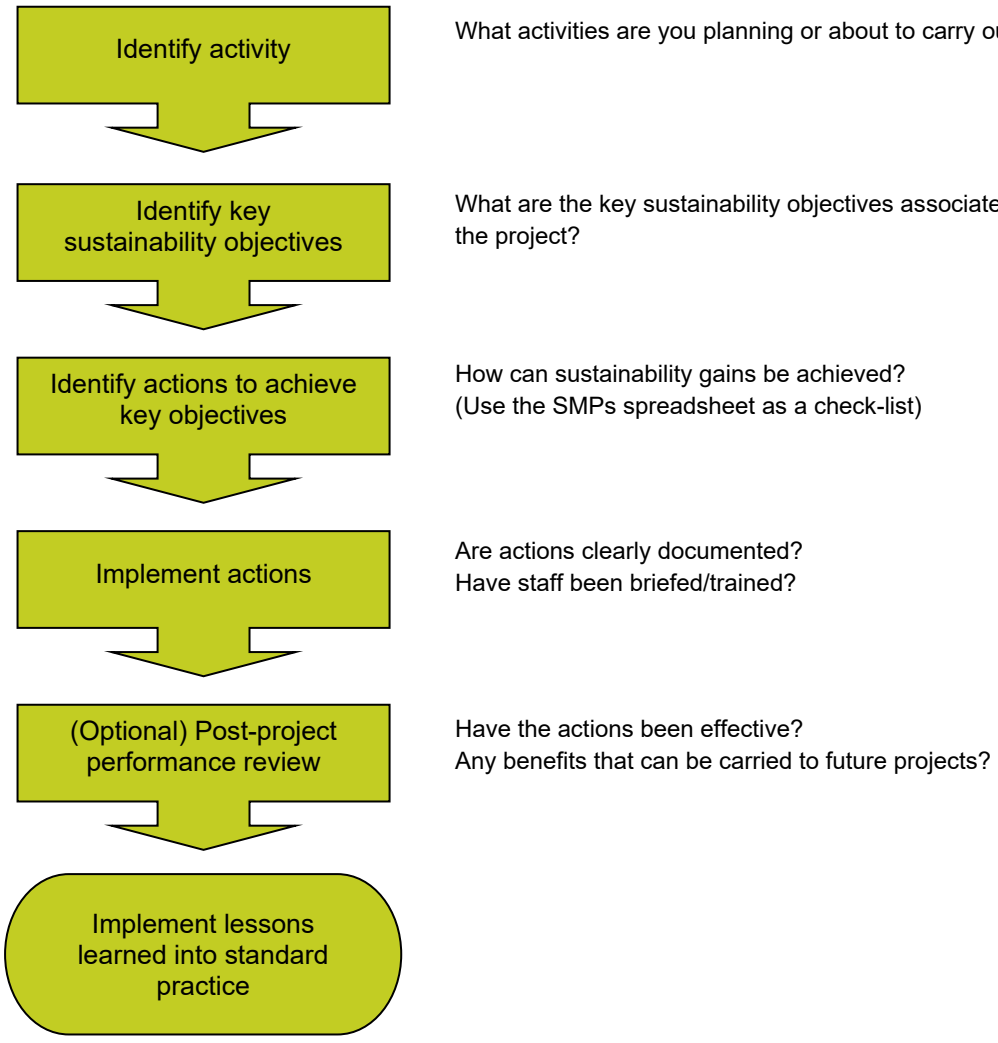


Figure 3.1: SMPs process flow chart.

3.1.1 Identify activity

In general, practitioners will be using the SMPs related to a particular activity, as identified in section 2.2, and the spreadsheet has been organised to enable the SMPs to be sorted by activity (1st step in Figure 3.1). At its simplest, this step is recognition of the activity that is being planned or about to be carried out and this should be done as part of the planning/proposal stage for projects. However, to focus the selection of SMPs it may be prudent to think of the key inputs, outputs and outcomes associated with the activity. As set out in section 2.2, the following activities are used in the SMP spreadsheet:

Generic:

- Procurement; and
- Land use planning

Land Contamination Risk Management:

- Risk assessment (primarily site investigation);
- Options appraisal;
- Remediation and verification – Develop a strategy;
- Remediation and verification – Construction and operation; and
- Remediation and verification – Verification and long-term monitoring and maintenance.

3.1.2 Identify key sustainability objectives

From an understanding of the activity (and the key inputs and outputs), a short-list of what is important to the project can be developed. In some cases, this may simply be taken from the sustainability objectives identified in the tender specification. For example, the client may set targets for: CO_2 emissions, use of natural resources (fuel, water), waste minimisation and recycling, health and safety, value for money, and being a good neighbour (aiming for zero complaints).

Sustainability objectives for a project may be associated with regulatory compliance (e.g. spill prevention, emissions limits), corporate targets (e.g. health and safety, fossil fuel use), or to address stakeholder concerns raised during previous consultation exercises (e.g. planning consultation).

3.1.3 Identify actions

The SMPs spreadsheet (see section 3.2) can then be used to identify actions relevant to the activity and key sustainability objectives. The practitioner should adopt a SMP where there is a good reason for doing so. SMPs should therefore be relevant to the project, typically quick to implement and deliver sustainability gains cost-effectively. As a reminder (see section 2.1), SMPs should not necessarily be ‘new things to do’ but are a means of demonstrating sustainability gains for a project. The spreadsheet may also be used as a communication tool with the client or wider stakeholder group to show the practitioner’s commitment to sustainability.

3.1.4 Implement actions

Once SMPs are identified they need to be put into practice. This may involve a number of actions, depending on the activity being carried out, but may include:

- Development of policy;
- Development of standard operating procedures;
- Procurement of goods or services;
- Incorporating the SMPs into the project design/methodology;
- Training or briefing of staff;
- Communication with other parties; and
- Implementation management.

Regarding the implementation management, it is important to ensure all roles and responsibilities are clearly defined and agreed with the relevant stakeholders.

It is important to also consider how the SMPs will be measured and reported both during and after the project. At this stage, specific roles and responsibilities for implementation of the SMPs should be clearly defined and communicated.

3.1.5 Post-project performance review

Although the use of SMPs is not intended to significantly increase workload, it is considered good practice to track their performance as the project progresses and review them at the end of a project for a number of reasons including:

- SMPs may be linked to corporate or project targets (e.g. carbon footprint, percentage of renewable energy used, waste recovery);
- Benefits may be transferrable to other projects (e.g. trained staff, revised standard operating procedures, use of low emission equipment);
- Social and environmental benefits may be demonstrated to build stakeholder confidence; and
- Cost savings may be evaluated.

The most important outcome is that of changed behaviours, where benefits may be transferred from project to project.

3.2 The Sustainable Management Practices spreadsheet

The SMPs spreadsheet is a template which can be used to identify, record and evaluate the SMPs for a specific project or portfolio of projects. The SMPs spreadsheet comprises three sheets:

- Instructions for use of the spreadsheet;
- Introduction – project details;
- ALL SMPs – with all sustainable management practices mapped against:
    - LCRM Project Activity
    - Sustainability Indicators

An assessment of relevance of a SMP to each activity has been made with a simple scoring system:

-	Indicates that the SMP is unlikely to be relevant to the activity
✓	Indicates that the SMP is potentially relevant to the activity, depending on specific project and / or site circumstances
✓✓	Indicates that the SMP is likely to be relevant to the activity.

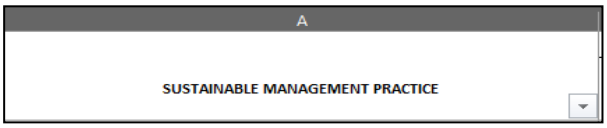
The practitioner can quickly assess whether SMPs are appropriate to use on a project-by-project basis. The spreadsheet may also be customised or updated to suit the practitioner and / or client needs. This spreadsheet is a checklist to encourage sustainable thinking for a project and is not to be considered a 'must do'. SMPs should only be considered where there is reason to believe that they will enhance the sustainability performance of the project.

3.3 Step-by-step instructions

To help the practitioner complete the SMPs spreadsheet step-by-step instructions are provided below:

1. **Project details**
   Open the "Introduction" sheet and complete the project information fields.

2. **Select data**
   Open the "ALL SMPs" sheet.



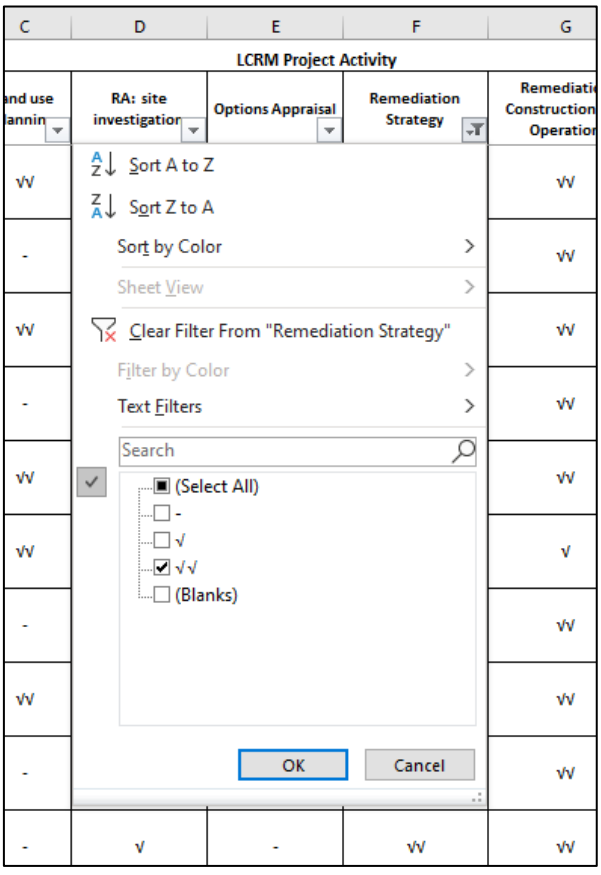
Column A provides a list of potential SMPs. Rows 1 and 2 are organised to show the LCRM Activities, the Sustainability Indicators and information regarding the selection and use of a SMP. The Sustainability Indicators are listed in the column headings using codes. The full title of the description of the Sustainability Indicators can be found by hovering the mouse pointer over the red triangle marker in the column heading cell.

Use filters and sorting to review this list by LCRM Project Activity or Sustainability Indicator. This will allow for identification of SMPs that best align with the project.

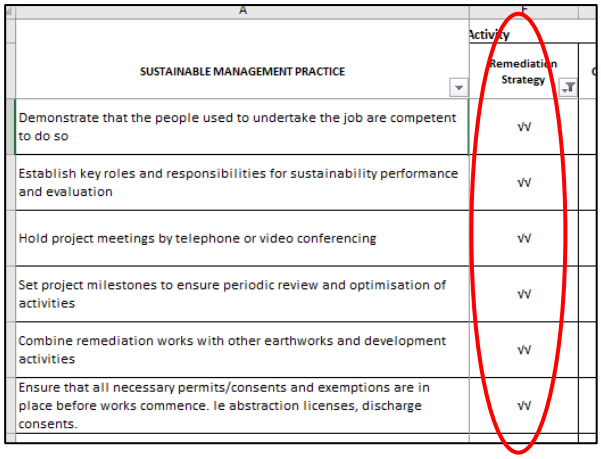
Click the filter/sort arrow on the LCRM Project Activity column which is of interest.

Uncheck the '(Select All)' box and check the '√√' box (see image to right). Only the SMPs that are likely to be relevant to the selected LCRM Project Activity of interest will now show.

Sort the relevant activity column (B-H) from Z-A. The most appropriate SMPs will then be at the top of the list to review.



In the example shown on the right, the data have been sorted by the Remediation Strategy activity. The most relevant SMPs for the Remediation Strategy Activity have now moved to the top of the column.

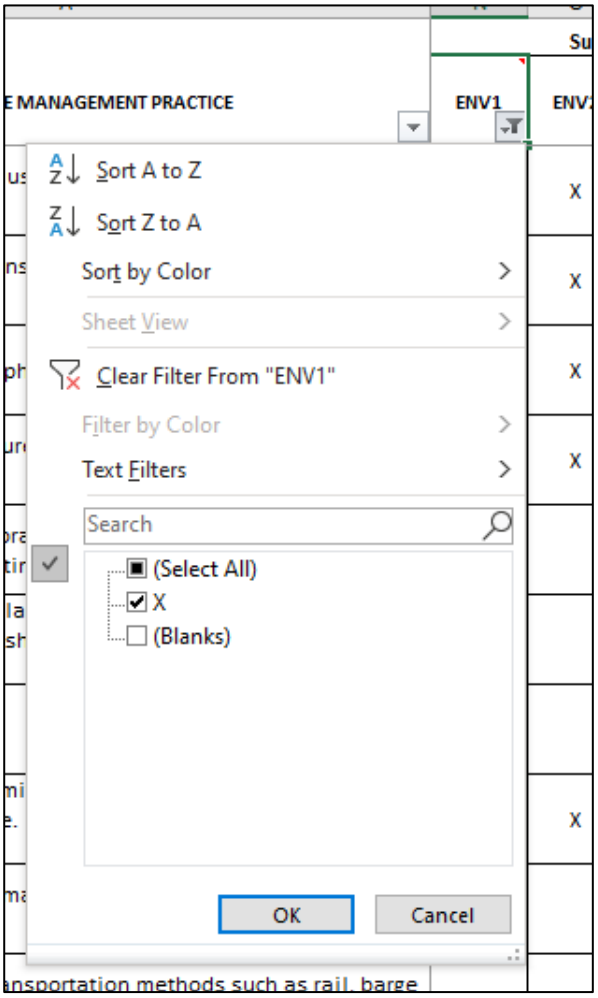


SUSTAINABLE MANAGEMENT PRACTICE	Remediation Strategy
Demonstrate that the people used to undertake the job are competent to do so	√√
Establish key roles and responsibilities for sustainability performance and evaluation	√√
Hold project meetings by telephone or video conferencing	√√
Set project milestones to ensure periodic review and optimisation of activities	√√
Combine remediation works with other earthworks and development activities	√√
Ensure that all necessary permits/consents and exemptions are in place before works commence. Ie abstraction licenses, discharge consents.	√√

It is also possible to further refine the list of SMPs by filtering using the Sustainability Indicators.

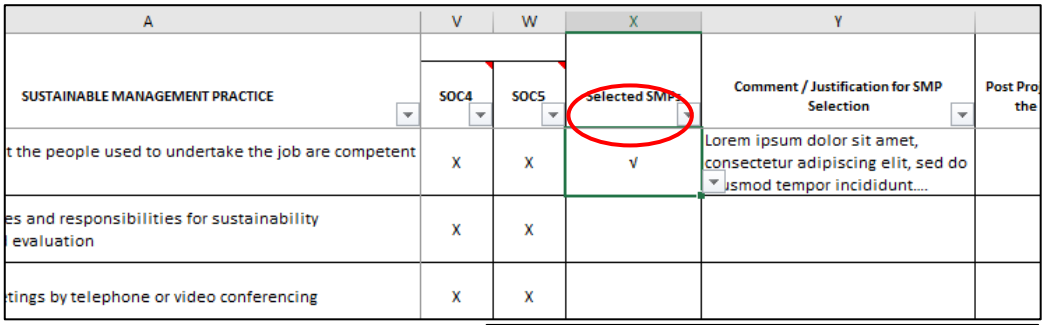
For example, to prioritise SMPs for Remediation Strategy relating to Air Emissions (ENV1), filter the Remediation Strategy column first by checking the '√√' box (as in the example above), then filter the ENV1 column by checking the 'X' box (see image to the right).

The SMPs will now be sorted so that the ones most relevant to Remediation Strategy *and* Air Emissions are at the top of the list.



3. Select SMPs

The ‘Selected SMP’ column (column X) can be used to mark which SMPs have been selected for the project (see image below). To mark the column, select the ‘√’ from the drop-down arrow in the cell.



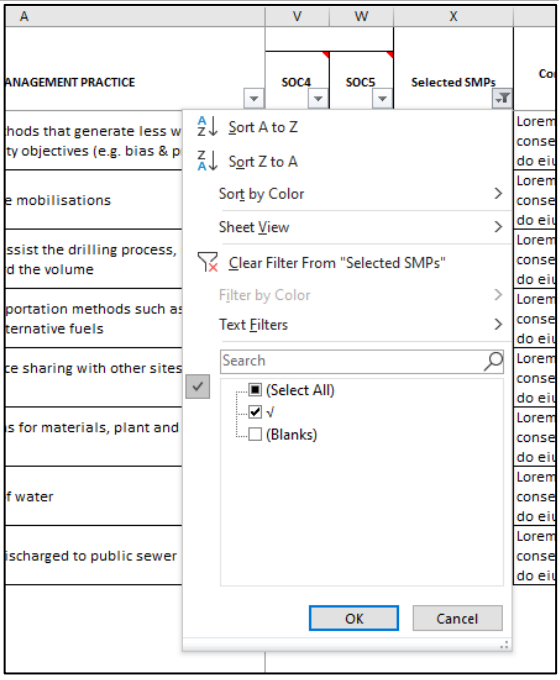
A	V	W	X	Y	
SUSTAINABLE MANAGEMENT PRACTICE	SOC4	SOC5	Selected SMPs	Comment / Justification for SMP Selection	Post Pro the
t the people used to undertake the job are competent	X	X	√	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do usmod tempor incididunt....	
es and responsibilities for sustainability evaluation	X	X			
tings by telephone or video conferencing	X	X			

A comment or justification for selecting your chosen SMPs can be written in column Y.

Once the relevant SMPs have been selected, all filters can be removed from the ‘LCRM Project Activity’ columns and ‘Sustainability Indicator’ columns.

To display only the selected SMPs, filter the ‘Selected SMP’ column (see image on the right).

The spreadsheet can then be saved or printed.



4. Reviewing SMPs

The spreadsheet can also be used for a post-project performance review (see image below). Whether or not a proposed SMP was implemented at project level can be indicated in ‘Post-Project Performance Review: Was the SMP Implemented? (Y/N)’ (column Z). The evidence to demonstrate how the SMP was implemented, or the reason why it was not, can be added in ‘Post-Project Performance Review’ (column AA).

A	Z	AA
SUSTAINABLE MANAGEMENT PRACTICE	Post Project Performance Review: Was the SMP Implemented? (Y/N)	Post-Project Performance Review Evidence/ Reason
Specify laboratory analytical methods that generate less waste and solvent use and meet data quality objectives (e.g. bias & precision)	Yes	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt...
Where practicable avoid multiple mobilisations	Yes	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt...
Where water has to be used to assist the drilling process, use only uncontaminated water and record the volume	No	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt...
Evaluate alternative waste transportation methods such as rail, barge or vehicles that operate using alternative fuels	Yes	Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt...

4. Case Studies

4.1 Use of Sustainable Management Practices by National Grid Property

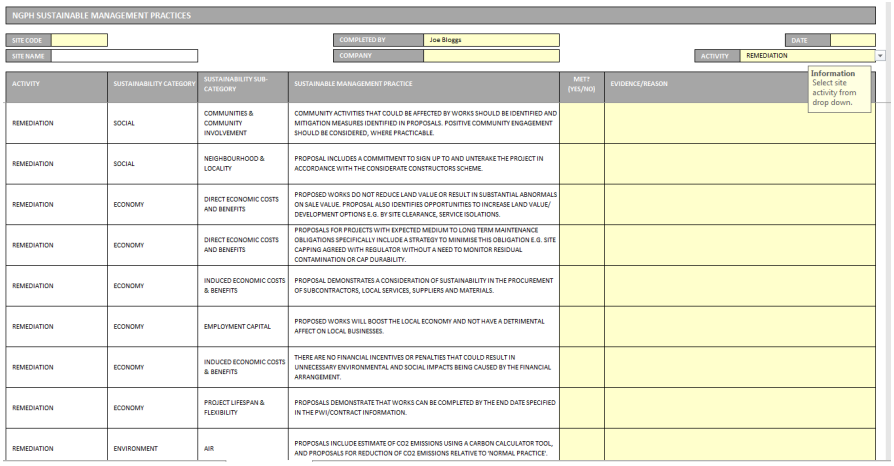
4.1.1 National Grid Property Holdings overview

National Grid Property (NGP) is committed to ensuring that the work they it undertakes to manage its environmental liabilities is done so in a sustainable way. NGP undertakes a variety of land regeneration activities such as site investigations, brownfield land remediation and gas holder dismantling. To ensure that sustainability is considered on all projects, NGP has a requirement for all land regeneration contractors and consultants to consider sustainability in decision making and recommendations to National Grid.

4.1.2 The use of SMPs

NGP uses SMPs as a means of ensuring that sustainability is considered in all of its land regeneration activities and not just the larger projects. NGP's view is that a Tier 1 to Tier 3 approach (CL:AIRE, 2020) may not always be appropriate or proportionate to the scale of a project, but it is nonetheless important to embed sustainability into all projects. Also, the nature of the projects NGP undertakes such as site investigation or gas holder dismantling can be similar between sites, so identifying common sustainability issues is an efficient way to work. The SuRF-UK SMPs spreadsheet was interrogated in order to select a set of SMPs appropriate for the main NGP activities. Approximately 20 SMPs from a range of social, economic and environmental indicators were selected for each activity and collated into a bespoke spreadsheet. Each SMP was then refined to reflect the expectations of NGP. This now represents a set of SMPs that NGP deems to be the minimum sustainability standards for its projects.

One of the benefits of using a structured SMP methodology is that although there is an initial investment in resources to identify a standard set of SMPs, these SMPs can be applied to many projects. Continuous improvement can be achieved by periodically reviewing the SMPs. As ways of working become more sustainable, the SMP can be updated as expectations increase.



NGPH SUSTAINABLE MANAGEMENT PRACTICES

SITE CODE | COMPLETED BY: Joe Blogs | DATE
SITE NAME | COMPANY | ACTIVITY: REMEDIATION

Information: Select site activity from drop down.

ACTIVITY	SUSTAINABILITY CATEGORY	SUSTAINABILITY SUB-CATEGORY	SUSTAINABLE MANAGEMENT PRACTICE	MET? (YES/NO)	EVIDENCE/REASON
REMEDIATION	SOCIAL	COMMUNITIES & COMMUNITY INVOLVEMENT	COMMUNITY ACTIVITIES THAT COULD BE AFFECTED BY WORKS SHOULD BE IDENTIFIED AND MITIGATION MEASURES IDENTIFIED IN PROPOSALS. POSITIVE COMMUNITY ENGAGEMENT SHOULD BE CONSIDERED, WHERE PRACTICABLE.		
REMEDIATION	SOCIAL	NEIGHBOURHOOD & LOCALITY	PROPOSAL INCLUDES A COMMITMENT TO SIGN UP TO AND UNTERAKE THE PROJECT IN ACCORDANCE WITH THE CONSIDERATE CONSTRUCTORS SCHEME.		
REMEDIATION	ECONOMY	DIRECT ECONOMIC COSTS AND BENEFITS	PROPOSED WORKS DO NOT REDUCE LAND VALUE OR RESULT IN SUBSTANTIAL ABNORMALS ON SALE VALUE. PROPOSAL ALSO IDENTIFIES OPPORTUNITIES TO INCREASE LAND VALUE/ DEVELOPMENT OPTIONS E.G. BY SITE CLEARANCE, SERVICE ISOLATIONS.		
REMEDIATION	ECONOMY	DIRECT ECONOMIC COSTS AND BENEFITS	PROPOSALS FOR PROJECTS WITH EXPECTED MEDIUM TO LONG TERM MAINTENANCE OBLIGATIONS SPECIFICALLY INCLUDE A STRATEGY TO MINIMISE THIS OBLIGATION E.G. SITE CAPPING AGREED WITH REGULATOR WITHOUT A NEED TO MONITOR RESIDUAL CONTAMINATION OR CAP DURABILITY.		
REMEDIATION	ECONOMY	INDUCED ECONOMIC COSTS & BENEFITS	PROPOSAL DEMONSTRATES A CONSIDERATION OF SUSTAINABILITY IN THE PROCUREMENT OF SUBCONTRACTORS, LOCAL SERVICES, SUPPLIERS AND MATERIALS.		
REMEDIATION	ECONOMY	EMPLOYMENT CAPITAL	PROPOSED WORKS WILL BOOST THE LOCAL ECONOMY AND NOT HAVE A DETRIMENTAL AFFECT ON LOCAL BUSINESSES.		
REMEDIATION	ECONOMY	INDUCED ECONOMIC COSTS & BENEFITS	THERE ARE NO FINANCIAL INCENTIVES OR PENALTIES THAT COULD RESULT IN UNNECESSARY ENVIRONMENTAL AND SOCIAL IMPACTS BEING CAUSED BY THE FINANCIAL ARRANGEMENT.		
REMEDIATION	ECONOMY	PROJECT LIFESPAN & FLEXIBILITY	PROPOSALS DEMONSTRATE THAT WORKS CAN BE COMPLETED BY THE END DATE SPECIFIED IN THE PWI/CONTRACT INFORMATION.		
REMEDIATION	ENVIRONMENT	AIR	PROPOSALS INCLUDE ESTIMATE OF CO_2 EMISSIONS USING A CARBON CALCULATOR TOOL, AND PROPOSALS FOR REDUCTION OF CO_2 EMISSIONS RELATIVE TO 'NORMAL PRACTICE'.		

Figure 4.1: NGP's bespoke spreadsheet of SMPs for its activities

4.1.3 Pre-project phase

Contractors and consultants are provided with a copy of the NGP SMP spreadsheet and are required to assess their proposals and tenders prior to submission, against the standard set of SMPs for the activity in question. If the requirements of a SMP are not met, the proposal or tender needs to be adjusted prior to submission so that it is, or a justification of why it is not met needs to be provided.

4.1.4 Project delivery

All projects are then delivered in accordance with the NGP SMPs. Sustainable Project Delivery is a standing agenda item at Progress Meetings in order to track SMP performance. The Contractor/Consultant is responsible for maximising sustainability gains on the project, and monitoring and reporting sustainability indicators (e.g. fuel, water use etc). Any deviation from the initial assumptions that underpin the SMPs must be noted in the SMPs spreadsheet. Upon completion of the project, the responsible Contractor/Consultant confirms that the project has been competed in accordance with the initial assessment against the required NGP SMPs at the Project Closeout Meeting.

4.1.5 Monitoring and assurance

Across the entire NGP Land Regeneration Programme the SMPs are reviewed and monitored via a centralised assurance function. This allows performance against the SMPs to be tracked and reported internally as part of NGP's sustainability commitments. It also allows for trends and deviations to be understood and shared to form the basis for continuous improvement.

4.1.6 Conclusion

The SuRF-UK SMPs provide a way to demonstrate sustainability gains for a project and to drive behavioural change across a business towards more sustainable working practices. The SURF-UK SMP spreadsheet is a simple means to select an activity, filter and review to quickly select a set of SMPs appropriate for a project. Alternatively, as described in this case study, a bespoke set of SMPs can be created for specific activities that a business regularly undertakes based on the principles of this document and using the examples in the SURF-UK SMPs spreadsheet as the foundation.

4.2 Sustainability Management in Shell's Global Downstream Soil and Groundwater programme

4.2.1 Sustainability in Shell

Sustainability in Shell means providing cleaner energy solutions in a responsible way. Shell's core values of honesty, integrity and respect for people – first laid out in the Shell General Business Principles more than forty years ago – underpin its approach to sustainability. A commitment to contribute to sustainable development was added in 1997.

These principles, together with its Code of Conduct, apply to the way Shell does business and to Shell's conduct with the communities where it operates. Since 1997, Shell has worked to embed this commitment in its strategy, business processes and decision-making. Sustainability is integrated across the business on three levels:

- Running a safe, efficient, responsible, and profitable business
- Helping to shape a more sustainable energy future
- Making a positive contribution to society

Shell has published an annual Sustainability Report since 1997, and also publishes reports on its tax contributions, and payments to governments[1].

4.2.2 Shell Downstream Soil and Groundwater programme

Each Shell business is responsible for managing its own soil and groundwater (SGW) risks, which is done in collaboration with a global SGW Solutions team. The Downstream business has a well-established global delivery model that uses a combination of business, central SGW Solutions, and third party consultants to identify, assess and manage its SGW risks. Sustainability is central to the SGW programme, which aims to deliver sustainable and risk-based solutions.

Building on the work of SuRF-UK and other global thought leaders, Shell developed internal guidance and mandatory requirements on sustainable remediation that have been in place since 2012. The latest version closely reflects the SuRF-UK Framework (CL:AIRE, 2010) and the Sustainable Remediation standard ISO 18504 (International Organization for Standardization, 2017).

SMPs are applied at both portfolio scale, and all stages of projects.

4.2.3 The use of SMPs in Shell

SMPs are used in two distinct ways in Shell. Firstly, consultants are required to consider SMPs at all stages of a project and identify the most suitable SMPs for the tasks and location. (This approach is similar to the NGP case study above, and therefore is not described further in this case study). Secondly a portfolio-scale sustainability assessment identifies the key SMPs that are most likely to make cost-effective material improvements in sustainability outcomes when implemented at the portfolio scale. This helps the project team focus their effort on implementing those SMPs that create the greatest sustainability benefits.

[1] https://www.shell.com/about-us/annual-publications.html

4.2.4 Portfolio-scale sustainability assessment

To determine which SMPs represent the most cost-effective and impactful actions to prioritise and implement, a portfolio-scale sustainability assessment method was developed and applied. The portfolio-scale sustainability assessment involved gathering data on SGW activities from a range of countries and applying metrics from commonly available tools to determine a sustainability footprint. The tools used include Battelle's Sitewise or US Environmental Protection Agency (US EPA) spreadsheets for environmental footprint analysis (SEFA). Data covering several years were obtained and used to generate a baseline, from which the impact of applying a specific SMP could be modelled. An example of a SMP that could be modelled is purchasing of renewable energy certificates for on-site plant drawing power from mains electricity to off-set the carbon emission.

The relative benefits of applying SMPs at a portfolio scale were captured using abatement curves to aid the presentation and communication to internal and external stakeholders. An illustrative abatement curve for a number of different SMPs targeting a net-reduction in greenhouse gas emissions is shown in Figure 4.1. In this graph, the height of the different bars relates to the cost per tonne of emissions reduced by implementing the SMP. The economic impact of implementing a SMP is defined using both direct and indirect economic costs and benefits (SURF-UK sustainability indicators ECON 1 and ECON 2). If the bar is negative, then the SMP is cheaper, and money saved relative to the base case. Conversely, if the bar is positive, the SMP will cost money to implement, relative to the baseline. The width of the bar relates to the amount of greenhouse gas emissions reduced by implementing the SMP relative to the baseline. This approach helps an assessor identify the most efficient way to abate emissions to achieve the required goals.

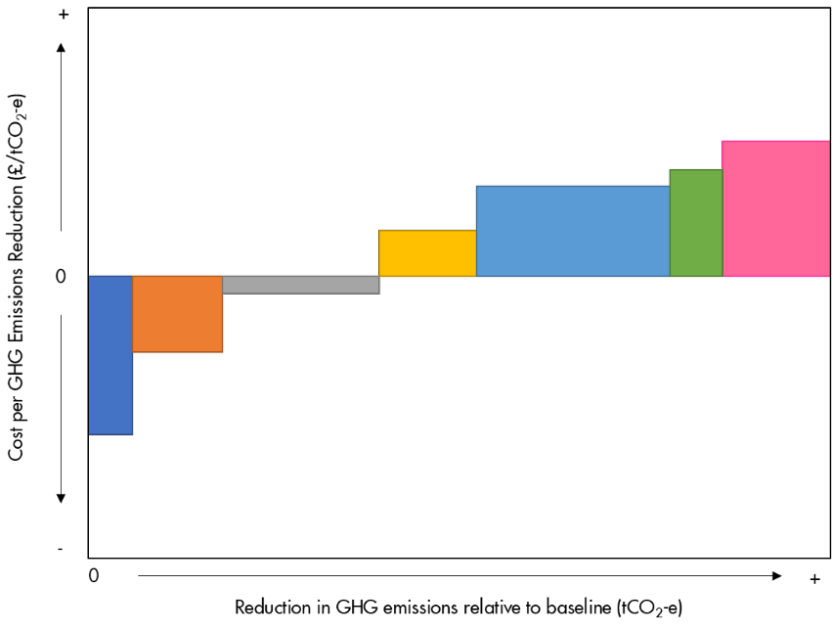


Figure 4.2: Illustrative abatement curve showing cost (£/tonne) as bar height, and magnitude of benefit (tonnes CO_2-e) as bar width, associated with different SMPs evaluated for their improvement of air emissions (ENV1). The different coloured bars represent different SMPs.

In this illustrative example, applying SMPs associated with blue, orange and grey bars not only reduces greenhouse gas emissions, but also reduces cost. Further SMPs (e.g. the yellow bar) can be applied if desired, but in this instance the emissions reduction comes at a financial cost. This visual representation allows SMPs to be prioritised. Those with cost savings can be implemented first and for those with financial cost, wider and lower SMPs represent more cost-effective solutions compared to narrow and tall SMPs.

This approach is an effective way of visualising the benefit of SMPs and helps direct portfolio-scale management decisions. At present, the approach has only been used for greenhouse gas emissions (ENV1), but it is intended to be applied to other sustainability indicators where the baseline can be readily quantified such as for Waste Generation and Resource Use (ENV5), in line with Shell's new Corporate Strategy and commitments (Shell, 2021).

References

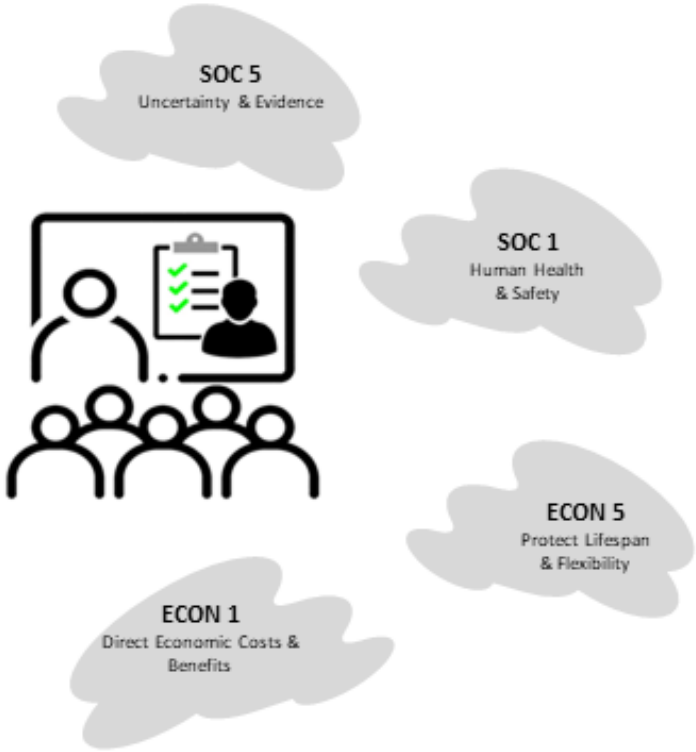
- Bardos R.P., Thomas H.F., Smith J.W.N., Harries N.D., Evans F., Boyle R., Howard T., Lewis R., Thomas A.O., Dent V.L., Haslam A., 2020. Sustainability assessment framework and indicators developed by SuRF-UK for land remediation option appraisal. Remediation. 2020;31:5-27. https://doi.org/10.1002/rem.21668
- British Standards Institution (BSI), 2011. BS 10175:2011 + A2:2017. Investigation of potentially contaminated sites. Code of practice.
- Capitals Coalition, 2016. Natural Capital Protocol. https://capitalscoalition.org/capitals-approach/natural-capital-protocol/
- Capitals Coalition, 2019. Social and Human Capital Protocol. https://capitalscoalition.org/capitals-approach/social-human-capital-protocol/
- Capony A., Lorino T., Muresan B., Baudru Y., Dauvergne M., Dunand M., Colin D. and Jullien A., 2012. Assessing the Productivity and the Environmental Impacts of Earthwork Machines: A Case Study for GPS-Instrumented Excavator. Procedia Social and Behavioral Science, Elsevier. https://www.sciencedirect.com/science/article/pii/S1877042812027425
- CL:AIRE, 2010. A Framework for Assessing the Sustainability of Soil and Groundwater Remediation. CL:AIRE, London. https://www.claire.co.uk/projects-and-initiatives/surf-uk/20-framework-and-guidance/89-framework-document
- CL:AIRE, 2020a. Supplementary Report 1 of the SuRF-UK Framework. A general Approach to Sustainability Assessment for Use in Achieving Sustainable Remediation. CL:AIRE, London. https://www.claire.co.uk/component/phocadownload/category/16-surf-uk-bulletins?download=719:supplementary-report-1-sustainability-assessment
- CL:AIRE, 2020b. Supplementary Report 2 of the SuRF-UK Framework: Selection of Indicators/Criteria for Use in Sustainability Assessment for Achieving Sustainable Remediation. CL:AIRE, London. https://www.claire.co.uk/component/phocadownload/category/16-surf-uk-bulletins?download=720:sr2-selection-of-indicators-criteria
- CL:AIRE, 2020c. Supplementary Report 2 – Indicators Appendix 1. CL:AIRE, London. https://www.claire.co.uk/component/phocadownload/category/16-surf-uk-bulletins?download=721:sr2-indicators-appendix-1
- Constructing Excellence, 2008. Plain English Guide to Sustainable Construction. https://constructingexcellence.org.uk/wp-content/uploads/2015/02/SUSTAINGUIDE.pdf

- Department of Environment, Food & Rural Affairs and Olympic Delivery Authority, 2013. London 2012 Legacy: Sustainable procurement for construction projects. London 2012 Legacy: Sustainable procurement for construction projects, Defra & Olympic Delivery Authority, 2013
- Department for Environment, Food & Rural Affairs and Environment Agency, 2019. Pollution Prevention for Businesses Guidance. https://www.gov.uk/guidance/pollution-prevention-for-businesses
- Environment Agency, 2018. The Environment Agency's approach to groundwater protection, February 2018, v1.2. Bristol, UK. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692989/Envirnment-Agency-approach-to-groundwater-protection.pdf
- Environment Agency, 2020. Land Condition Risk Management. https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm
- International Organization for Standardization (ISO), 2017. Soil quality - Sustainable remediation. ISO 18504:2017. www.iso.org/standard/62688.html
- Interstate Technology & Regulatory Council (ITRC), 2011. Green and Sustainable Remediation: A Practical Framework. ITRC, Washington. http://www.itrcweb.org/Team/Public?teamID=7
- Royal Dutch Shell plc (Shell), 2021. Powering progress. https://www.shell.com/powering-progress.html
- United Nations, 2015. Transforming our world: the 2030 Agenda for Sustainable Development. A/RES/70/1. United Nations Official Document
- Waris M., Shahir Liew M., Faris Khamidi M. and Idrus A., 2014. Criteria for the selection of sustainable onsite construction equipment. International Journal of Sustainable Built Environment, Elsevier. https://www.sciencedirect.com/science/article/pii/S221260901400034X

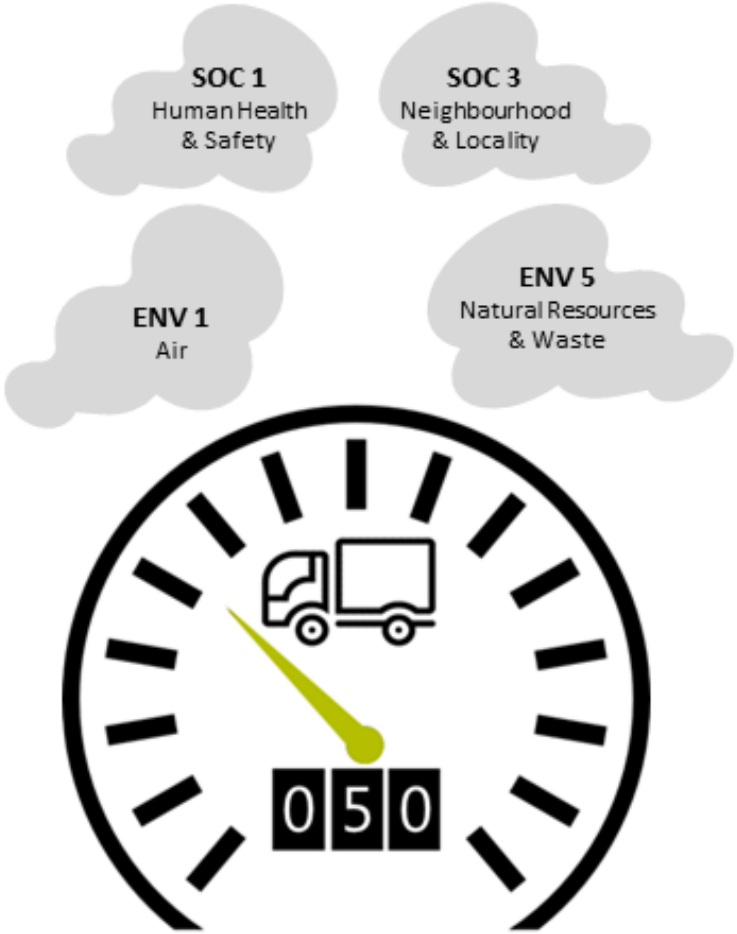
Appendix 1: Sustainable Management Practice Examples

The images on the following pages are available to download directly from Sustainable Management Practices (www.claire.co.uk/surf-uk) and displayed as reminders of good practice.

Demonstrate that the people used to undertake the job are competent to do so



Minimise vehicle miles



Consider use of cleaner fuels & additives (e.g. ultra low sulphur diesel) for non-road plant. Electric, hybrid.

SOC 1
Human Health & Safety

SOC 3
Neighbourhood & Locality

ENV 1
Air

ENV 5
Natural Resources & Waste

SuRF

CL:AIRE
LEADING SUSTAINABLE LAND REUSE

Consider opportunities for supporting STEM

SOC 2
Ethics & Equity

SOC 4
Communities & Community Involvement

ECON 3
Employment & Employment Capital

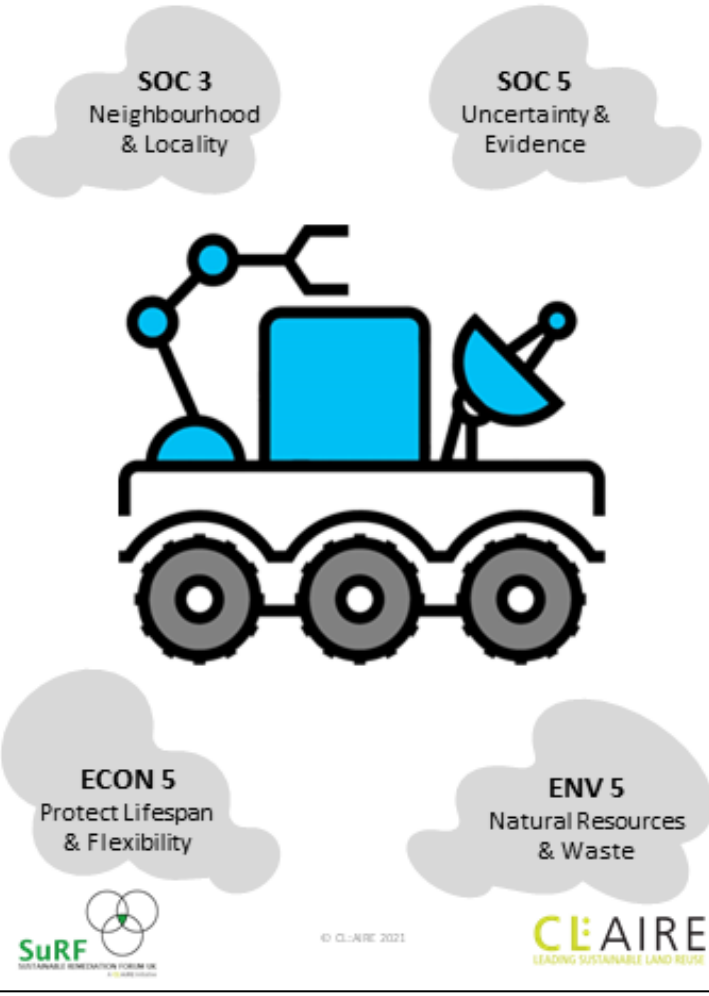
SuRF

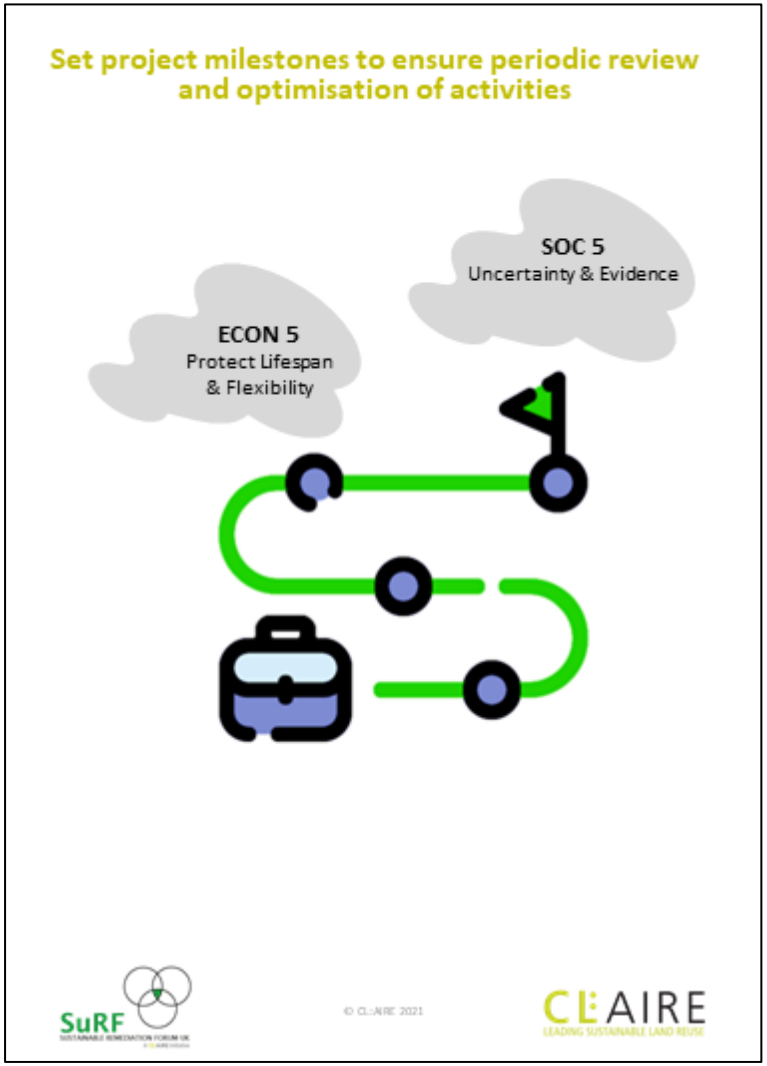
STEM LEARNING

CL:AIRE
LEADING SUSTAINABLE LAND REUSE

Ensure proper maintenance of vehicles, plant & equipment. Tyre pressures, correct loading of vehicles.

Consider the use of a mobile laboratory and/or field testing techniques to reduce off-site shipment of samples and improve spatial data




Set project milestones to ensure periodic review and optimisation of activities
SOC 5
Uncertainty & Evidence
ECON 5
Protect Lifespan & Flexibility
SuRF
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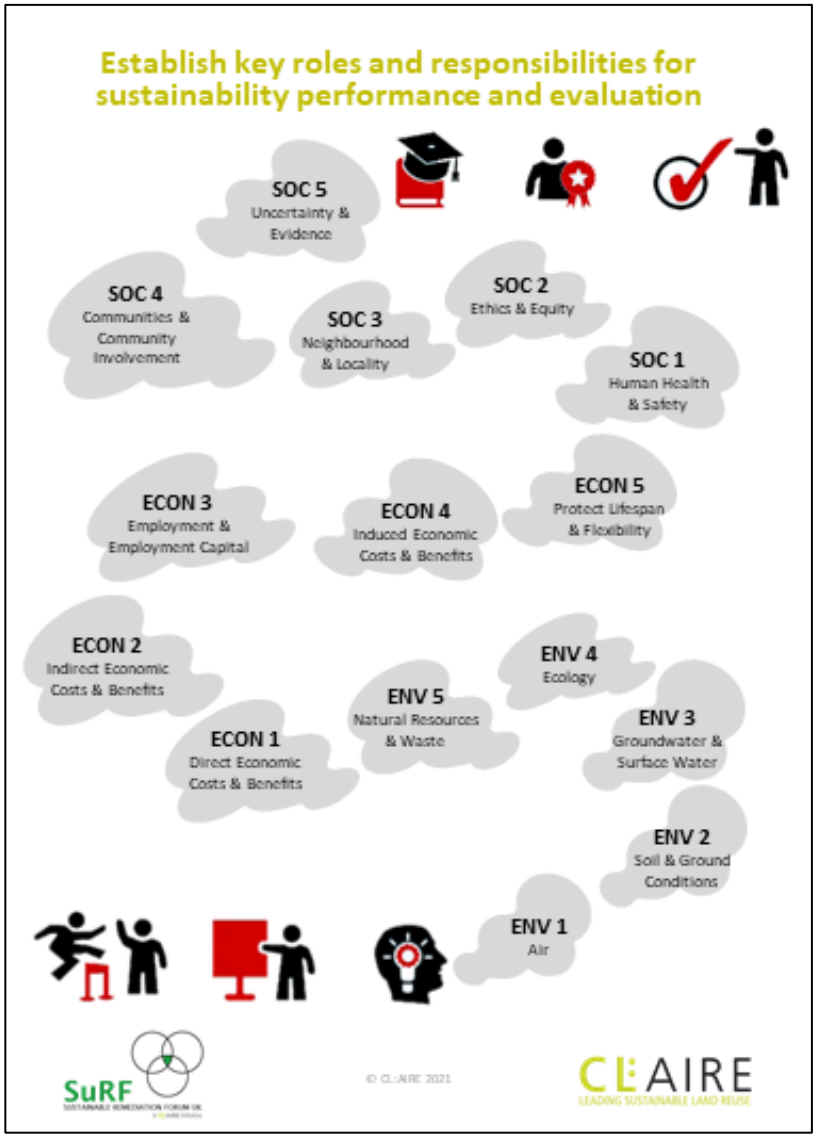
LEADING SUSTAINABLE LAND REUSE


Establish key roles and responsibilities for sustainability performance and evaluation
SOC 5
Uncertainty & Evidence
SOC 4
Communities & Community Involvement
SOC 3
Neighbourhood & Locality
SOC 2
Ethics & Equity
SOC 1
Human Health & Safety
ECON 3
Employment & Employment Capital
ECON 4
Induced Economic Costs & Benefits
ECON 5
Protect Lifespan & Flexibility
ECON 2
Indirect Economic Costs & Benefits
ENV 4
Ecology
ENV 5
Natural Resources & Waste
ENV 3
Groundwater & Surface Water
ECON 1
Direct Economic Costs & Benefits
ENV 2
Soil & Ground Conditions
ENV 1
Air
SuRF
© CL:AIRE 2021
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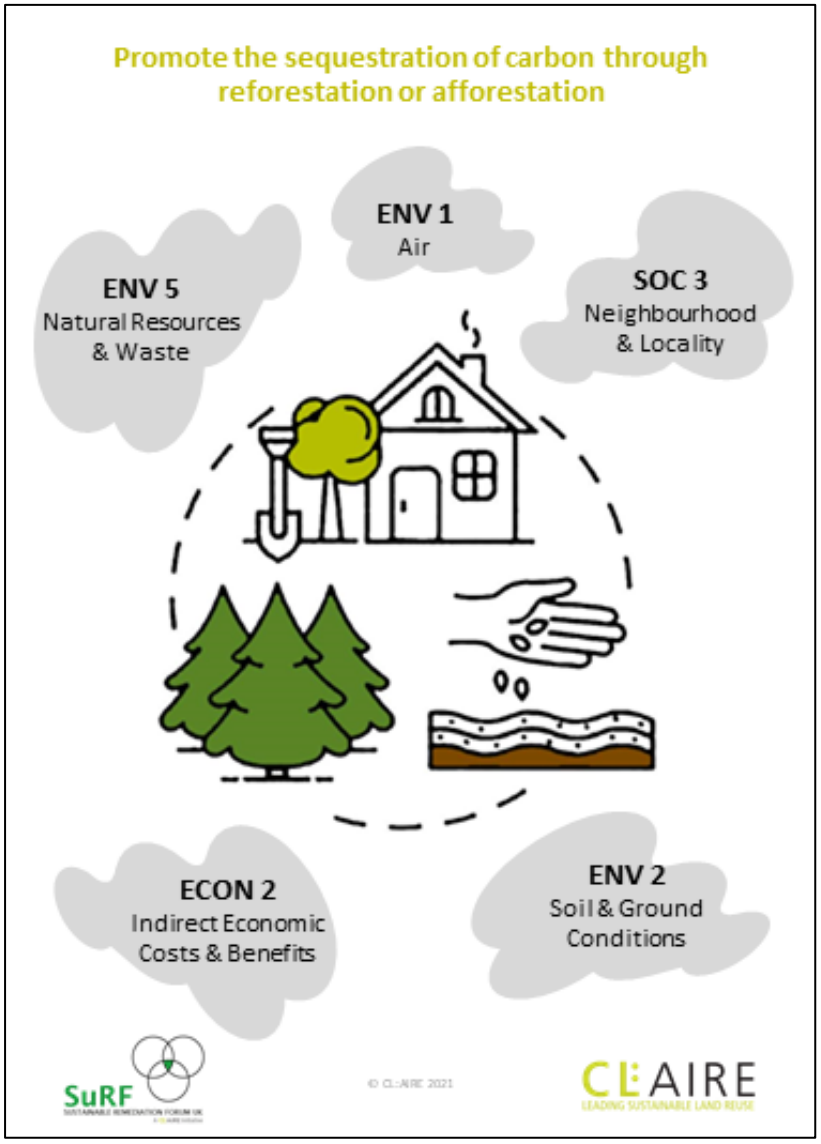
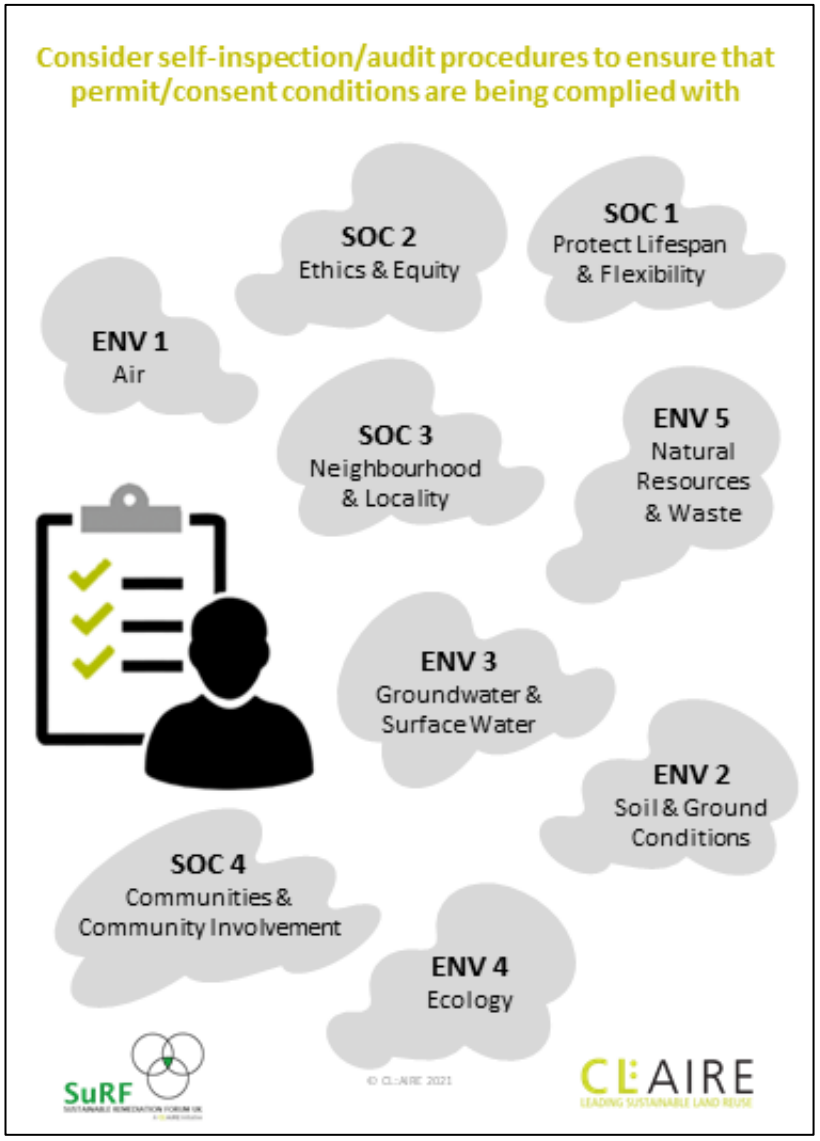
LEADING SUSTAINABLE LAND REUSE


Promote the sequestration of carbon through reforestation or afforestation
ENV 1
Air
ENV 5
Natural Resources & Waste
SOC 3
Neighbourhood & Locality
ECON 2
Indirect Economic Costs & Benefits
ENV 2
Soil & Ground Conditions
SuRF
© CL:AIRE 2021
CL:AIRE


Consider self-inspection/audit procedures to ensure that permit/consent conditions are being complied with
SOC 2
Ethics & Equity
SOC 1
Protect Lifespan & Flexibility
ENV 1
Air
SOC 3
Neighbourhood & Locality
ENV 5
Natural Resources & Waste
ENV 3
Groundwater & Surface Water
ENV 2
Soil & Ground Conditions
SOC 4
Communities & Community Involvement
ENV 4
Ecology
SuRF
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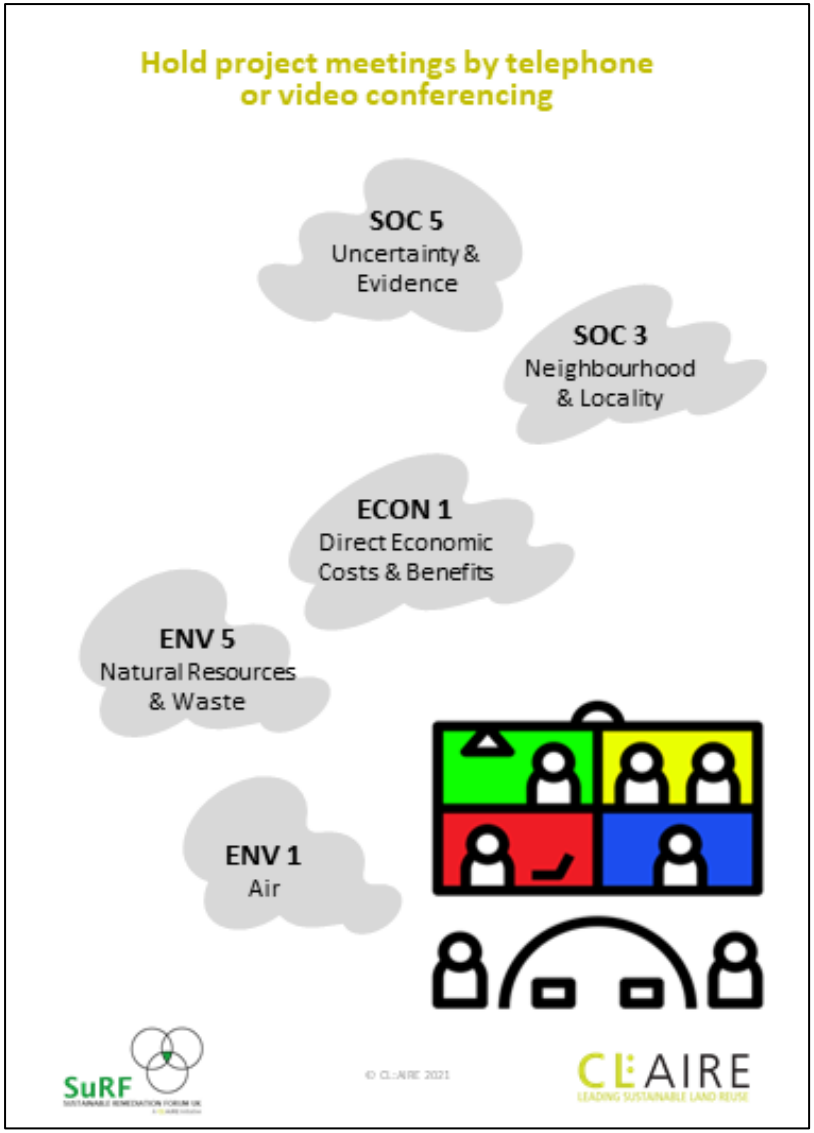
Hold project meetings by telephone or video conferencing
SOC 5
Uncertainty & Evidence
SOC 3
Neighbourhood & Locality
ECON 1
Direct Economic Costs & Benefits
ENV 5
Natural Resources & Waste
ENV 1
Air
SuRF
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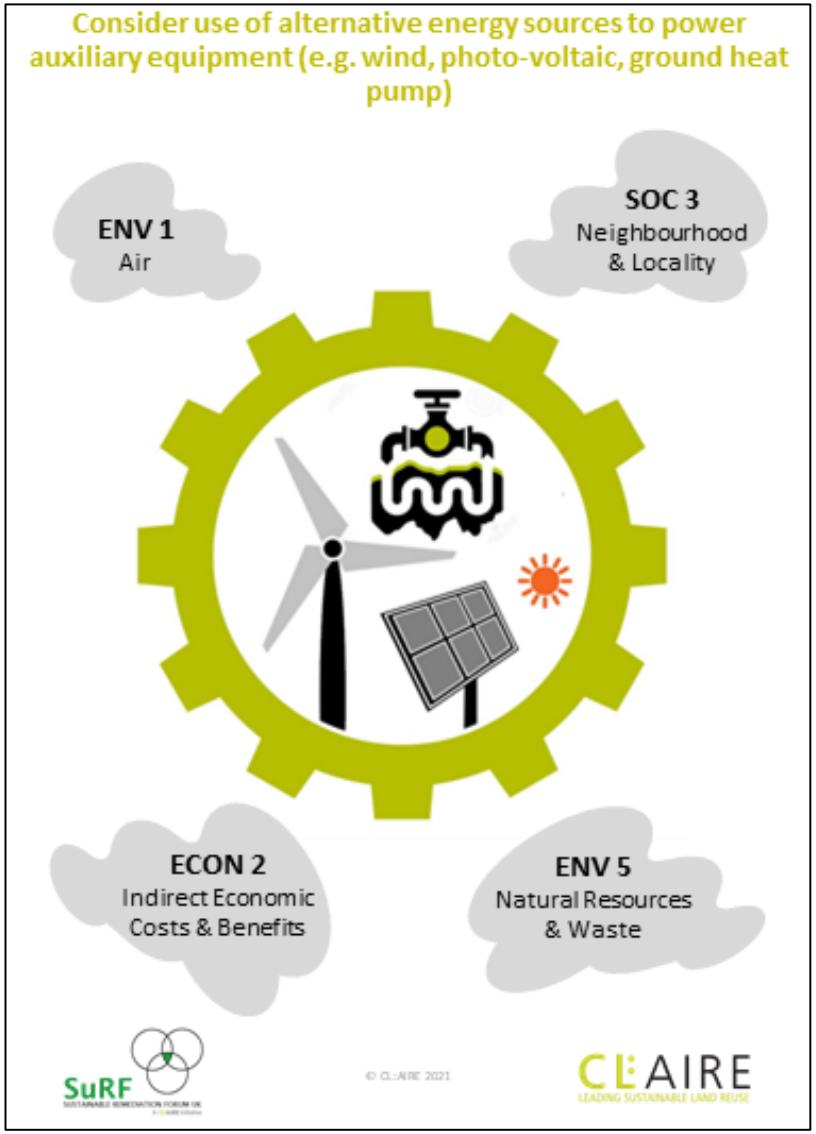
Consider use of alternative energy sources to power auxiliary equipment (e.g. wind, photo-voltaic, ground heat pump)
ENV 1
Air
SOC 3
Neighbourhood & Locality
ECON 2
Indirect Economic Costs & Benefits
ENV 5
Natural Resources & Waste
SuRF
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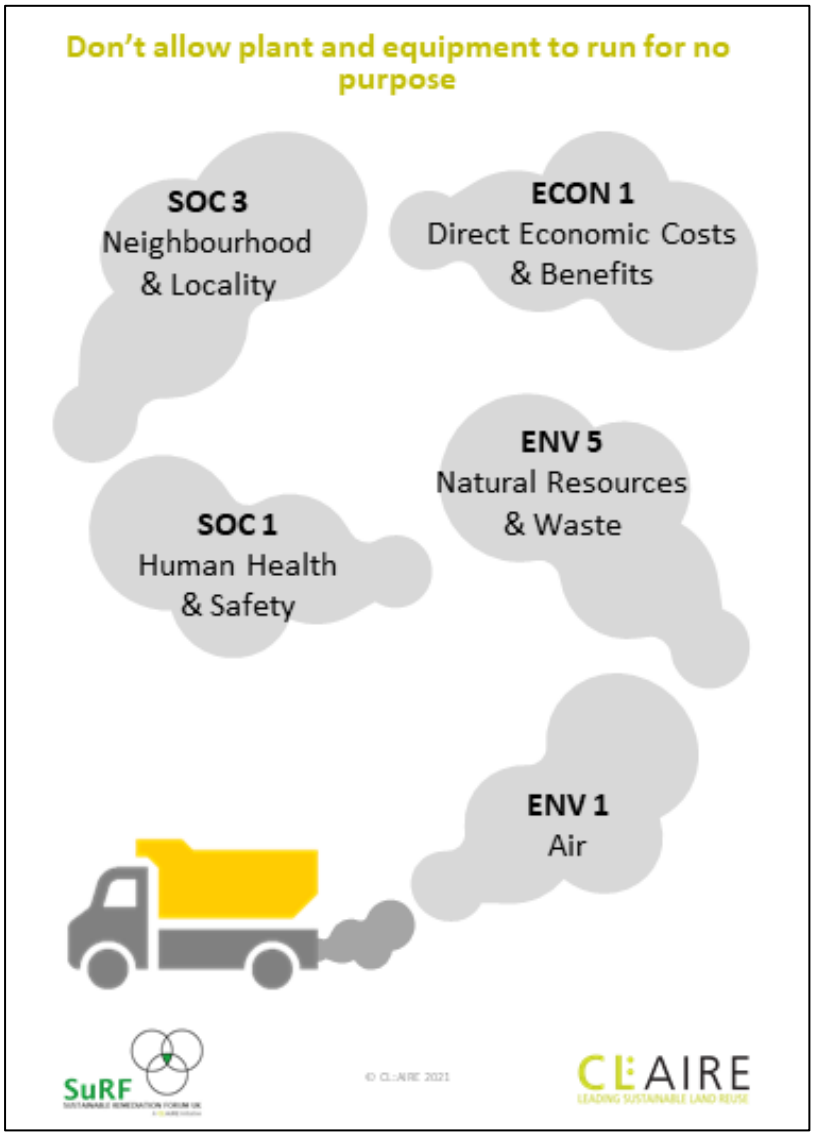
Don't allow plant and equipment to run for no purpose
SOC 3
Neighbourhood & Locality
ECON 1
Direct Economic Costs & Benefits
ENV 5
Natural Resources & Waste
SOC 1
Human Health & Safety
ENV 1
Air
SuRF
© CL:AIRE 2021
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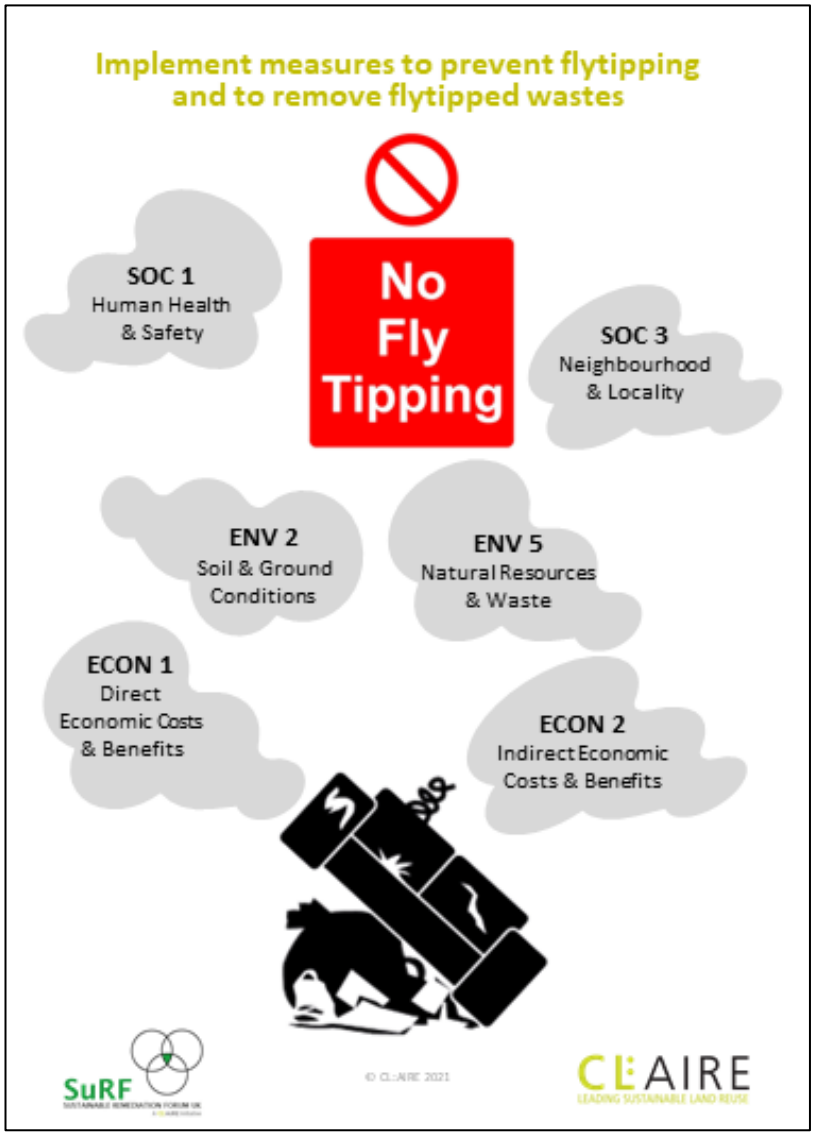
Implement measures to prevent flytipping and to remove flytipped wastes
No Fly Tipping
SOC 1
Human Health & Safety
SOC 3
Neighbourhood & Locality
ENV 2
Soil & Ground Conditions
ENV 5
Natural Resources & Waste
ECON 1
Direct Economic Costs & Benefits
ECON 2
Indirect Economic Costs & Benefits
SuRF
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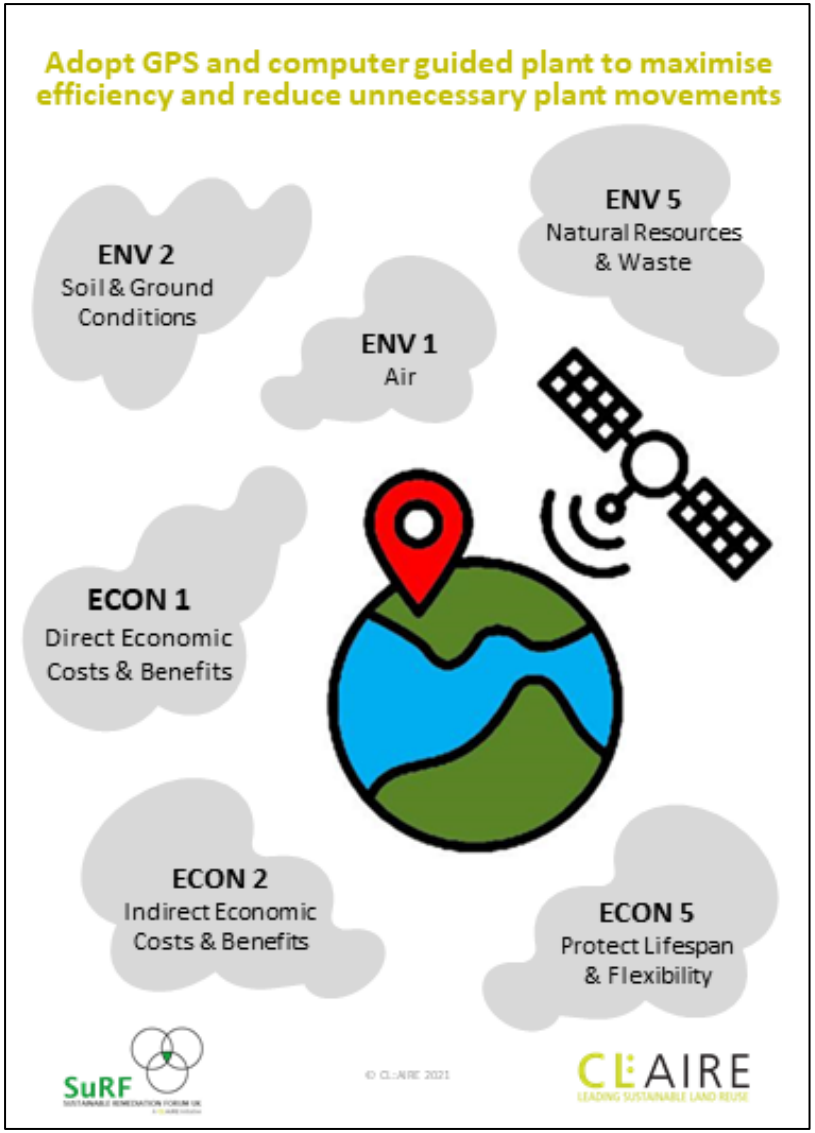
Adopt GPS and computer guided plant to maximise efficiency and reduce unnecessary plant movements
ENV 2
Soil & Ground Conditions
ENV 5
Natural Resources & Waste
ENV 1
Air
ECON 1
Direct Economic Costs & Benefits
ECON 2
Indirect Economic Costs & Benefits
ECON 5
Protect Lifespan & Flexibility
SuRF
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LEADING SUSTAINABLE LAND REUSE

Appendix 2: Sustainable Management Practice Spreadsheet

The functional spreadsheet is available to download as a Microsoft Excel file from the SuRF-UK pages of the CL:AIRE website (www.claire.co.uk/surf-uk).

The following pages illustrate the SMPs contained in the spreadsheet.

SUSTAINABLE MANAGEMENT PRACTICE	Procurement of goods & services	Land use planning	RA: site investigation	Options Appraisal	Remediation Strategy	Remediation Construction and Operation	Verification and monitoring	ECON1	ECON2	ECON3	ECON4	ECON5	ENV1	ENV2	ENV3	ENV4	ENV5	SOC1	SOC2	SOC3	SOC4	SOC5
Avoid contaminating soil - safe secure storage and use of materials, fuel and waste	-	-	√√	-	√√	√√	-	X	X					X			X					
Demonstrate that the people used to undertake the job are competent to do so	√√	√√	√√	√√	√√	√√	√√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ensure the workforce is suitably trained to operate effectively and safely	-	-	√√	-	√√	√	√	X	X	X								X				
Establish key roles and responsibilities for sustainability performance and evaluation	-	-	√√	√√	√√	√√	√√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hold project meetings by telephone or video conferencing	√√	√√	√√	√√	√√	√√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implement measures to prevent flytipping and to remove flytipped wastes	-	-	√√	-	-	√√	√	X	X					X				X		X		
Implement site security to prevent accidental access and trespass	-	-	√√	-	-	√√	√	X	X									X		X		
Set project milestones to ensure periodic review and optimisation of activities	-	-	√√	-	√√	√√	√√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Avoid mixing soil types (e.g. top soil with sub-soil)	-	√	√√	-	-	√√	-	X						X			X					
Consider electronic data transfer systems for information exchange between parties, reporting and archiving	√√	-	√√	√	√√	√√	√√	X									X					X
Consider integrating investigation strategies, e.g intrusive and non-intrusive techniques, archaeological and trial pit surveys	-	-	√√	-	√√	√	√√	X														X
Consider non-intrusive surveys to delineate sources and areas affected by contamination (e.g. geophysical surveys)	-	-	√√	-	√√	√√	√√	X									X					X
Consider the proximity of laboratories to the site when evaluating qualified laboratories for testing that cannot be completed on-site	-	-	√√	-	√√	-	√	X					X				X			X		
Consider the use of a mobile laboratory/field testing techniques and/or non-intrusive surveys to reduce off-site shipment of samples and improve spatial data	-	-	√√	-	√√	√√	√√	X					X				X			X		X
Consider use of cleaner fuels & additives (e.g. ultra low sulphur diesel) for non-road plant e.g Electric, hybrid.	√	-	√√	-	√	√√	√	X					X				X	X		X		
Consider use of direct-push technology instead of rotary drilling	-	-	√√	-	-	√√	√	X							X		X			X		
Consider use of engines with efficient exhaust (particulate) filter system	-	-	√√	-	√	√√	-	X					X					X		X		
Don't allow plant and equipment to 'idle'	-	-	√√	-	-	√√	√	X					X				X	X		X		
Ensure proper maintenance of vehicles, plant & equipment e.g. Tyre pressures, correct loading of vehicles.	-	-	√√	-	-	√√	√	X					X				X	X		X		
Identify stakeholders most likely to be impacted by the activity and engage and minimise the impact on them.	-	√	√√	√√	√√	√	√	X											X		X	X
Minimise vehicle miles	-	-	√√	√	√√	√√	√√	X					X				X	X		X		
Plan to re-use boreholes through each phase of investigation, remediation and long-term monitoring	-	-	√√	√	√√	√	√√	X									X	X		X		
Reduce, reuse and recycle where possible. Plan your activities to reduce waste.	-	-	√√	-	√√	√√	√	X									X					
Select suitably sized plant and equipment	-	-	√√	-	√√	√√	√	X									X			X		
Specify electronic data transfer from laboratories	√√	-	√√	-	√√	√√	√√	X									X					X
Avoid drilling in the road or busy access areas where possible	-	-	√√	-	√√	√√	√		X									X		X		

Avoid drilling through confining layers without appropriate protection to prevent cross-contamination	-	-	√√	-	√√	√√	√		X						X							
Consider self-inspection/audit procedures to ensure that permit/consent conditions are being complied with	-	-	√√	-	√	√√	√		X				X	X	X	X			X			
Develop an Ecology Management Plan to identify and manage impacts on areas of ecological interest before disturbing the site	-	√√	√√	-	√√	√	-		X							X				X		
Develop/implement a plan to communicate project issues & progress with external stakeholders	-	√	√√	√	√√	√√	√√		X												X	
Develop/implement measures to prevent the off-site migration of vermin (e.g. rats) when the site is disturbed	-	-	√√	-	√	√√	-		X											X		
Ensure appropriate training is provided, and measures taken to deal with unexploded ordnance (UXO)	-	-	√√	-	-	√√	-		X									X		X		
Ensure appropriate training is provided, and measures taken, to prevent injury from manual handling	-	-	√√	-	√	√√	√√		X									X		X		
Ensure fuels and other chemicals are stored in secure, suitably bunded facilities away from watercourses, drains, flood risk areas and areas with high collision risk	-	-	√√	-	√	√√	√		X					X	X			X				
Ensure personnel are appropriately trained in implementing the emergency plan & incident response procedures	-	-	√√	-	-	√√	√		X	X								X				
Ensure that all necessary permits/consents and exemptions are in place before works commence. i.e. abstraction licenses, discharge consents.	-	√√	√√	-	√√	√	√		X				X	X	X	X			X			
Ensure that sources of asbestos are identified before the site is disturbed (e.g. demolition)	-	-	√√	-	√√	√	-		X									X		X		
Ensure that the risk of unexploded ordnance (UXO) on site is considered	-	-	√√	-	√√	-	-		X									X		X		
Identify all drainage systems on-site and design measures to mitigate any pollution risks	-	√	√√	-	√√	√√	√		X						X					X		
Identify location of underground services before excavation or drilling	-	-	√√	-	-	√√	√		X									X		X		
Implement an inspection schedule for containers, valves, pipe joins and secondary bunding	-	-	√√	-	√	√√	√		X					X	X			X				
Implement the Considerate Constructors Scheme Code of Considerate Practice	-	-	√√	-	√	√√	√		X							X		X		X	X	
Implement International Association of Oil & Gas Producers Life Saving Rules (as relevant to project activities)	-	-	√√	-		√√	√		X									X				
Keep a spill kit close to the fuel or other fluids/chemicals storage area	-	-	√√	-	-	√√	√√		X					X	X			X				
Observe a stand-off from surface water courses, flood defences and abstraction boreholes	-	√√	√√	-	√√	√√	-		X						X							
Prepare & implement an emergency plan for the site	-	-	√√	-	√	√√	√√		X									X				
Respond effectively to complaints about e.g. noise, dust, odour, smoke, light nuisance	-	-	√√	-	-	√√	-		X											X	X	
Stockpile contaminated materials in a sealed & bunded area	-	-	√√	-	√	√√	-		X					X	X							
Take appropriate measures to prevent contact with overhead cables	-	-	√√	-	√	√√	√		X									X		X		
Take care to prevent cross-contamination between drilling locations - decontaminate all equipment	-	-	√√	-	-	√√	√√		X						X				X			X
Take measures to prevent access and damage to protected areas	-	√√	√√	-	√	√√	√√		X							X						
Use systems to separate clean and 'dirty' water	-	-	√√	-	√	√√	√		X						X					X		
Avoid mixing soil with waste	-	-	√√	-	-	√√	-							X								

Avoid removal of trees where practicable	-	√√	√√	-	√√	√√	-									X				X		
Consider measures to eradicate or control the spread of invasive, non-native species	-	√√	√√	-	√√	√√	√									X				X		
Consider mobile data capture	-	-	√√	-	√	√√	√√													X		X
Consider publishing a case study to highlight innovation used in the project	-	-	√√	-	√√	-	√√															X
Consider the use of dedicated sampling equipment/dataloggers to minimise cross-contamination	-	-	√√	-	√√	√√	√√								X							X
Consider use of extraction hood/canopy during excavation/drilling in VOC-impacted soils	-	-	√√	-	√	√√	-						X					X		X		
Consider use of phosphate-free detergents to decontaminate sampling equipment	-	-	√√	-	√√	√√	√√								X							
Consider using communication tools, such as regular newsletters, open days or a website	-	√√	√√	√√	√√	√√	√√														X	
Control and mitigate noise, vibration, dust (etc.)	-	-	√√	-	√	√√	√													X		
Decommission monitoring wells to prevent preferential pathways. Follow Environment Agency guidance.	-	-	√√	-	-	√√	√√								X							
Develop a conceptual model, with uncertainties identified, and review when additional information becomes available	-	√√	√√	√√	√√	√√	√√															X
Develop and implement an investigation/sampling strategy to obtain data that are 'fit for purpose'	-	-	√√	-	√√	√√	√√															X
Develop and implement Life-Saving Rules or similar to improve health & safety performance	√	√	√√	√	√√	√√	√√											X				
Do not store fuels etc near monitoring wells or water courses.	-	-	√√	-	-	√√	-								X							
Enhance community culture through the use of local art, an on-site visitors' centre, display boards etc..	-	-	√√	-	√√	√√	√														X	
Ensure all staff and site visitors receive a health & safety induction	-	-	√√	-	-	√√	√√											X				
Ensure that a unique referencing / numbering system is in place for boreholes, trial pits and sample identification	-	-	√√	-	√√	√√	√√															X
Evaluate carbon footprint for major activities and implement a CO2 emissions reduction plan	√√	-	√√	√	√√	√√	√						X				X					X
Identify any invasive, non-native species on-site	-	√√	√√	-	√√	√√	√									X				X		
Identify protected sites (e.g. Site of Special Scientific Interest (SSSI), Regionally Important Geological/Geomorphological Sites (RIGS) or heritage sites) and protect them	-	√√	√√	-	√√	√√	-							X	X					X		
Implement a plan to provide structured training on sustainability initiatives associated with the project	-	√	√√	√√	√√	√√	√√			X									X			X
Implement policies that discourage unhealthy behaviour such as smoking, drug and alcohol abuse	-	-	√√	-	-	√√	√√											X				
Inform neighbours about potentially noisy activity before it happens	-	-	√√	-	-	√√	√														X	
Install monitoring wells in an appropriate way to prevent preferential pathways.	-	-	√√	-	-	√√	√								X							
Learning from experience - ensuring a system is in place to document lessons learned, and to disseminate the findings.	√√	√√	√√	√√	√√	√√	√√															X
Locate fixed plant away from sensitive areas or mitigate impacts (e.g. location of exhausts, silencers or acoustic housing/barriers)	-	-	√√	-	√	√√	√													X		
Provide an accessible, inclusive and safe environment (e.g. good lighting, wheelchair ramps, clean roads & pavements)	-	√	√√	-	√√	√√	√											X	X	X		

Provide training to personnel on the importance of ecosystem protection	-	√√	√√	-	√	√√	-			X						X						
Sequence work and traffic patterns to minimise impacts on the local community	-	-	√√	-	-	√√	√						X					X		X		
Set clear objectives to ensure that data collection is focussed and fit for purpose	√√	√	√√	√√	√√	√√	√√															X
Specify laboratory analytical methods that generate less waste and solvent use and meet data quality objectives (e.g. bias & precision)	-	-	√√	-	√√	-	√										X					
Use bailers (no-purge) or low-flow samplers where suitable	-	-	√√	-	√	√√	√√										X					
Use plain English - avoid technical jargon	√√	√√	√√	√√	√√	√√	√√														X	
When forming a trial pit, segregate excavated layers and reinstate each layer as close as possible to the depth from which it was removed	-	-	√√	-	-	√	-							X								
Where practicable avoid multiple mobilisations	-	√	√√	-	√√	√√	√										X	X		X		
Where water has to be used to assist the drilling process, use only uncontaminated water and record the volume	-	-	√√	-	√√	√√	√√								X		X					
Work with local communities to ensure the characteristics of the locality are preserved or enhanced	-	√√	√√	-	√√	√√	√												X		X	
Select facilities such as hotels or meeting venues offering sustainability policies	√√	√	√	√√	√	√	√	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Consider limiting the size of a working face in VOC-contaminated soil	-	-	√	-	√	√√	-	X										X		X		
Evaluate alternative waste transportation methods such as rail, barge or vehicles that operate using alternative fuels	√√	√√	√	√√	√√	√	-	X				X	X				X			X		
Identify opportunities for resource sharing with other sites (e.g. within portfolio, cluster)	√	√√	√	√	√√	√	√	X									X			X		
Identify potential incentives for improved site use (e.g. optimum land use options wrt contaminant distribution)	-	√√	√	-	√	-	-	X														
Identify reuse or recycling options for materials, plant and equipment removed from site	-	-	√	-	√√	√	√√	X									X					
Minimise the consumptive use of water	-	√√	√	-	√√	√√	√	X									X			X		
Minimise the volume of waste discharged to public sewer	-	√√	√	-	√√	√√	√	X					X				X			X		
Minimise the volume of waste sent to landfill	-	√√	√	-	√√	√√	√	X					X				X			X		
Schedule activities during appropriate seasons to reduce delays, community or ecological impact, and energy requirements	-	√	√	-	√√	√√	√	X					X				X			X		
Sequence remedial work phases to reduce or limit double handling of materials at the site	-	√√	√	-	√√	√	-	X					X							X		
Consider a survey of the site to identify and safeguard protected species and habitat	-	-	√	-	√√	√	-		X							X				X		
Divert runoff away from stockpiles	-	-	√	-	√	√√	-		X					X	X							
Ensure any culturally sensitive site use is taken into consideration before implementation (e.g. burial grounds, religious buildings, or culturally sensitive areas)	-	√√	√	-	√√	√	-		X										X	X		
Implement a plan to incorporate external economic impacts into decision-making	-	√√	√	-	√	-	-		X													
Limit the time during which chemicals or hazardous substances are stored on-site	-	-	√	-	-	√√	√		X					X	X			X				
Locate stockpiles away from watercourses and areas at risk from flooding	-	-	√	-	√√	√√	-		X					X	X							

Adopt an equal opportunities policy - implement training / mentoring / apprenticeships	√√	-	√	-	-	√√	-			X	X								X		X	
Adopting an anti-slavery policy	√√	-	√	-	-	√√	-												X			
Avoid overcompaction (use tracked vehicles)	-	-	√	-	-	√√	-							X								
Confine off-site traffic movement to designated routes e.g., major roads rather than narrow residential streets	-	-	√	-	√√	√√	-											X		X		
Confine on-site traffic movement to designated routes to minimise nuisance from dust and noise	-	-	√	-	√√	√√	-							X				X		X		
Consider a survey of soil types before disturbing the site (Soil Resource Plan)	-	√√	√	-	√	√	-							X			X					
Consider alternatives to the use of herbicides near water. If herbicides are used follow relevant guidance.	-	-	√	-	√	√√	-								X							
Consider conducting an Equality Impact Assessment.	-	√√	√	-	√√	√	√												X			
Consider covering excavated areas with biodegradable fabric or foam to suppress VOC emissions	-	-	√	-	√	√√	-						X					X		X		
Consider engaging a specialist to identify soil resources. Minerals assessment / geotechnical properties.	-	√√	√	-	√	√	-							X			X					
Consider reusing local ecological resources (e.g. seeds, cuttings) in site restoration	√	√√	√	-	√√	√√	-									X				X		
Consider use of alternative energy sources to power auxiliary equipment (e.g. wind, photo-voltaic, ground heat pump)	-	√√	√	-	√√	√√	√				X		X				X			X		
Consider using products with recycled, renewable or bio-based materials	-	-	√	-	√√	√√	√										X					
Consider using settlement tanks or lagoons to remove silt from water (e.g. pumped from excavations, run-off) before discharge	-	-	√	-	√	√√	-							X	X		X					
Consider ways to maximise positive benefits to local communities	-	√√	√	√√	√	√	-												X			
Develop/implement a plan to include external stakeholders in decision-making	-	√√	√	√√	√√	√	√															
Improve employee engagement with sustainability - assign 'sustainability champions'	√	-	√	-	-	√	-												X		X	
Encourage refillable water bottles rather than buying plastic bottles.	-	-	√	-	-	√	√										X					
Ensure that remediation information, including the verification report and monitoring data, are securely archived	-	√	√	-	√√	√	√√					x										x
Establish an on-site facility to house native vegetation uprooted during remediation activities	-	-	√	-	√√	√√	-			X						X				X		
Minimise the amount of exposed soil	-	-	√	-	√√	√√	-							X	X							
Paying a living wage rather than minimum wage	√√	-	√	-	-	√√	-			X	X								X			
Plant and wheel-washing to be carried out on contained hardstanding at least 10 m from water course or surface water drain	-	-	√	-	√√	√√	-								X							
Revegetate restored soil as soon as practicable	-	-	√	-	-	√√	-							X								
Stockpile soils for as short a period as possible	-	√	√	-	-	√√	-							X								
Store soil types in segregated stockpiles, identified on a site plan	-	-	√	-	√	√√	-							X			X					
Consider the use of Construction Environmental Management Plans	-	-	√	-	-	√√	-						X				X			X	X	

Adopt a sustainable procurement policy	√√	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Combine remediation works with other earthworks and development activities	-	√√	-	-	√√	√√	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Communicate remediation options to relevant stakeholders in a consultative process	-	-	-	√√	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implement a plan to evaluate sustainability criteria/indicators sets for the project	-	-	-	√√	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implement a plan to provide structured training in sustainable procurement practice	√√	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Implement a sustainable procurement plan for the project/site	√√	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Obtain input on remediation options from relevant stakeholders and manage community needs and concerns	-	-	-	√√	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Plan site layout with regard to minimising the physical remediation required	-	√√	-	√	√	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Request that the functional performance specifications of products are supplied	√√	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Set sustainability criteria in the specification to motivate suppliers to provide more sustainable products and services	√√	-	-	-	-	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Conduct bench-scale/pilot trials to estimate the material quantities required for remediation	-	-	-	√	√√	√	-	X									X					
Conduct periodic review of treatment processes to identify diminishing return	-	-	-	-	-	√√	√	X														X
Consider appointing contractors on a value for money rather than lowest cost basis	√√	-	-	-	-	-	-	X														
Consider capture and re-use of grey water	-	√√	-	-	√√	√√	-	X							X		X					
Consider discharge of unused water to surface water or SUDS rather than to sewer	-	√√	-	-	√√	√√	√	X							X		X					
Consider export of contaminated soil to a local treatment facility and return of suitable treated soil for re-use (cluster approach)	-	√	-	√	√√	√	-	X					X				X					
Consider gravity-flow instead of pumping to move water	-	√√	-	-	√√	√√	-	X							X		X			X		
Consider implementing a silt management plan	-	-	-	√√	√√	√√	-	X						X	X		X					
Consider incentivising contracts to maximise value for money and sustainability gains	√√	-	-	-	-	-	-	X														
Consider recovery of treated soil for re-use on-site where suitable for use as set out in the Materials Management Plan	-	√√	-	√	√√	√	-	X					X				X			X		
Consider use of methane capture system with electricity generation	-	-	-	-	√√	-	-	X					X				X			X		
Consider using existing site infrastructure for remediation works, e.g. housing equipment, offices, etc..	-	√√	-	-	√√	√	-	X									X					
Consider that institutional controls are in place to secure future land use and funds to maintain the controls	-	√√	-	-	√	-	√√	X			X	X						X	X			X
Optimise the efficiency of the remediation system to meet environmental, social and economic objectives	-	-	-	√√	√√	√√	√	X														X

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