



The Sustainable Remediation of an Agrochemical Manufacturing Facility

Dr Alan Thomas ERM, Oxford, UK

Co-authors:

ERM (all UK): David Manning, Jack Stapeley, Lotte Leclezio

EESI (Bristol, UK): Ross Pollock

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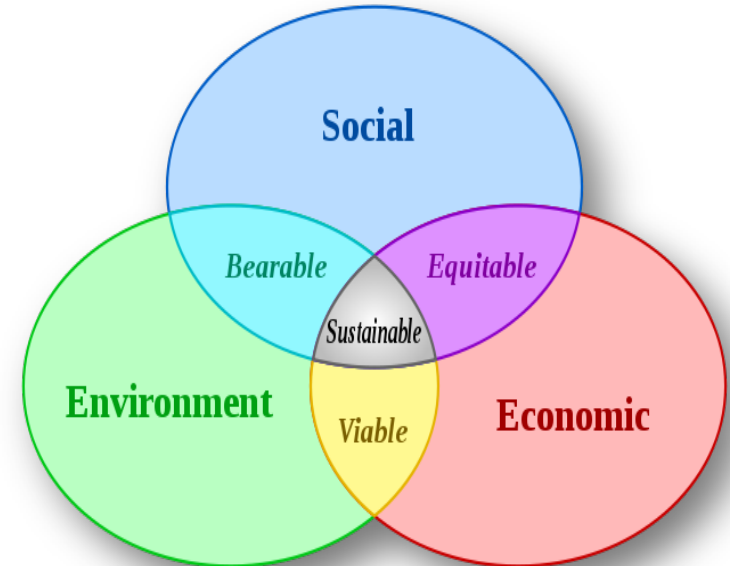
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The business of sustainability



Introduction

- Sustainable remediation is defined as “elimination and/or control of unacceptable risks in a safe and timely manner whilst optimising the environmental, social and economic value of the work” - ISO 18504
- There still remain relatively few examples of application across life cycle of project
- This case study will provide a high level overview of the practical application of the SuRF UK framework in a recent remediation project highlighting some of the key benefits





The Site

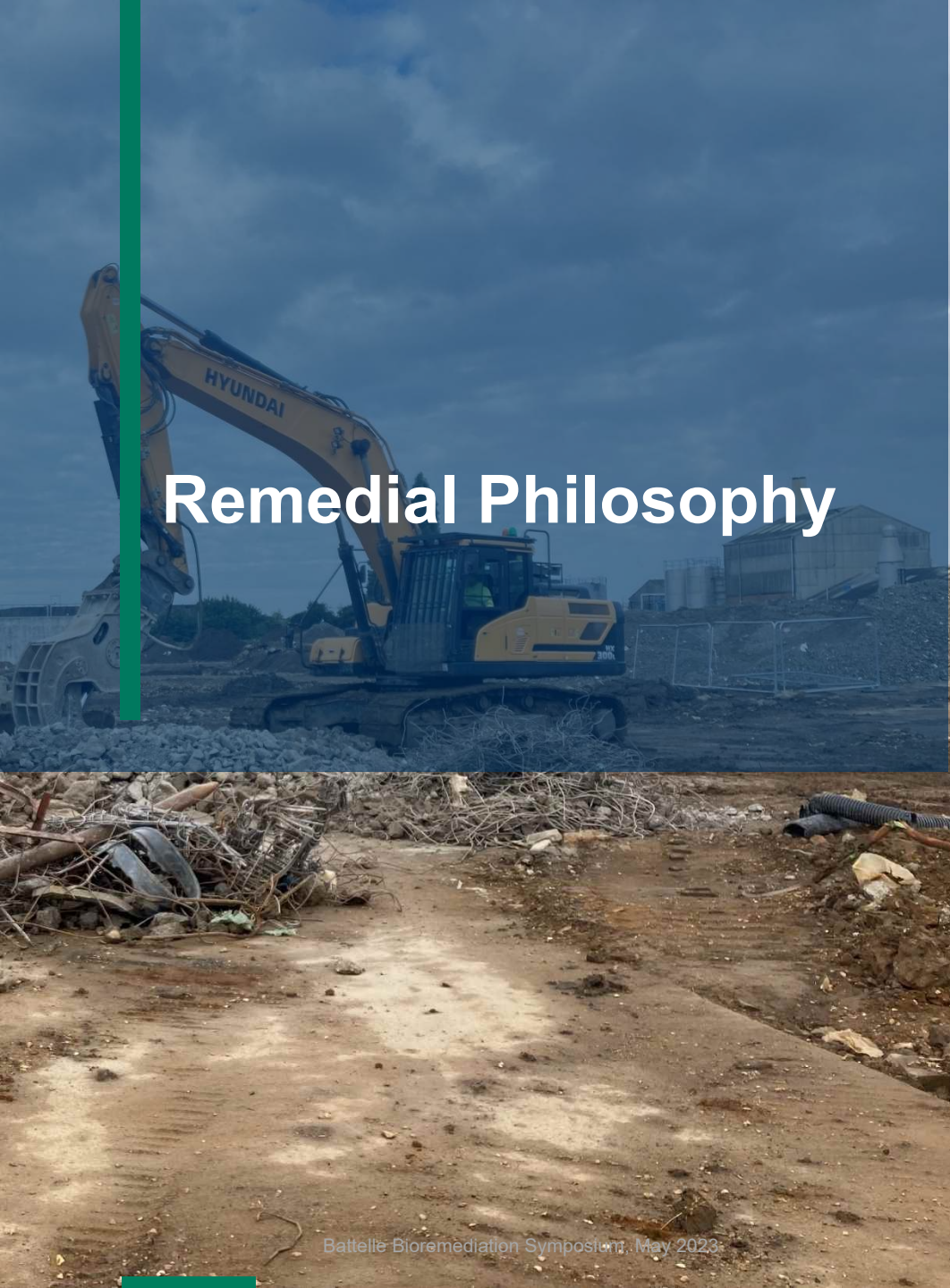
Operational agrichemical facility since the 1970s

Estuarine environmental setting. Groundwater classified as a non aquifer but close proximity to surface waters.

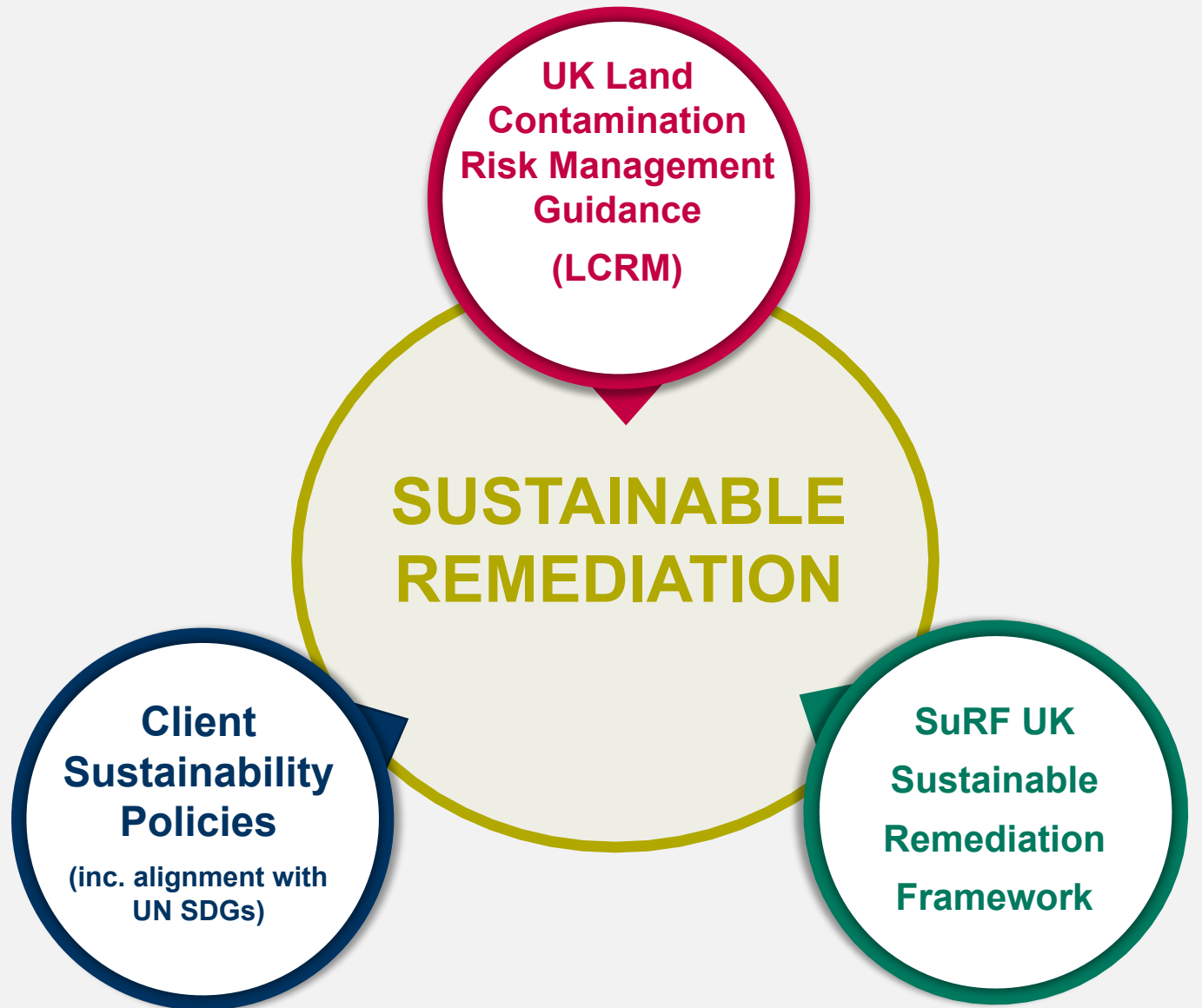
Contaminants of concern included active ingredients and VOCs (including chlorinated hydrocarbons)

Some of the contaminants had Environmental Quality Standards marginally above laboratory detection limit

Manufacturing activities ceased in 2020. Client decommissioning activities were followed by a programme of building demolition and ex-situ soil & groundwater remediation.



Remedial Philosophy



The Process of Incorporating Sustainable Remediation

1 Project Planning, Site Investigation & Risk Assessment

2 Remedial Options Appraisal

3 Contractor Procurement Process

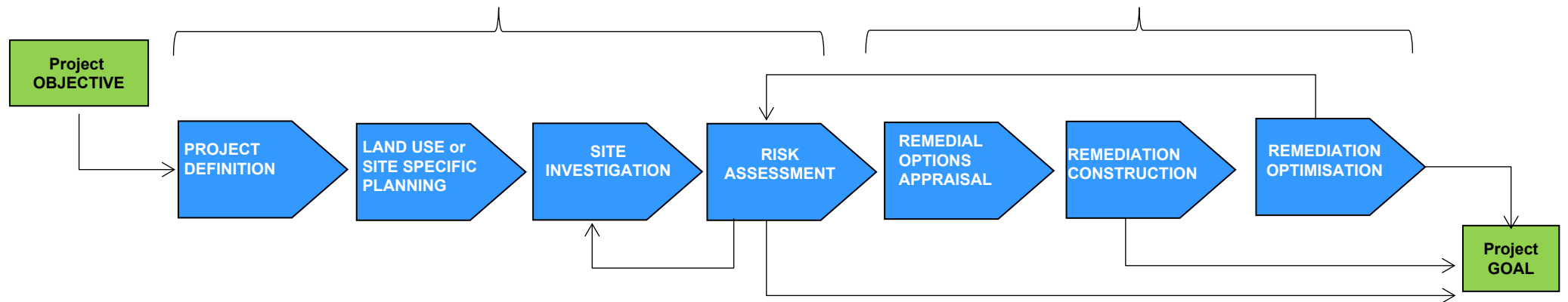
4 Remediation Implementation Phase



UK LCRM Guidance and SuRF UK Framework

Stage A / Setting the remediation specification and strategy

Stage B / Setting the remediation technical approach

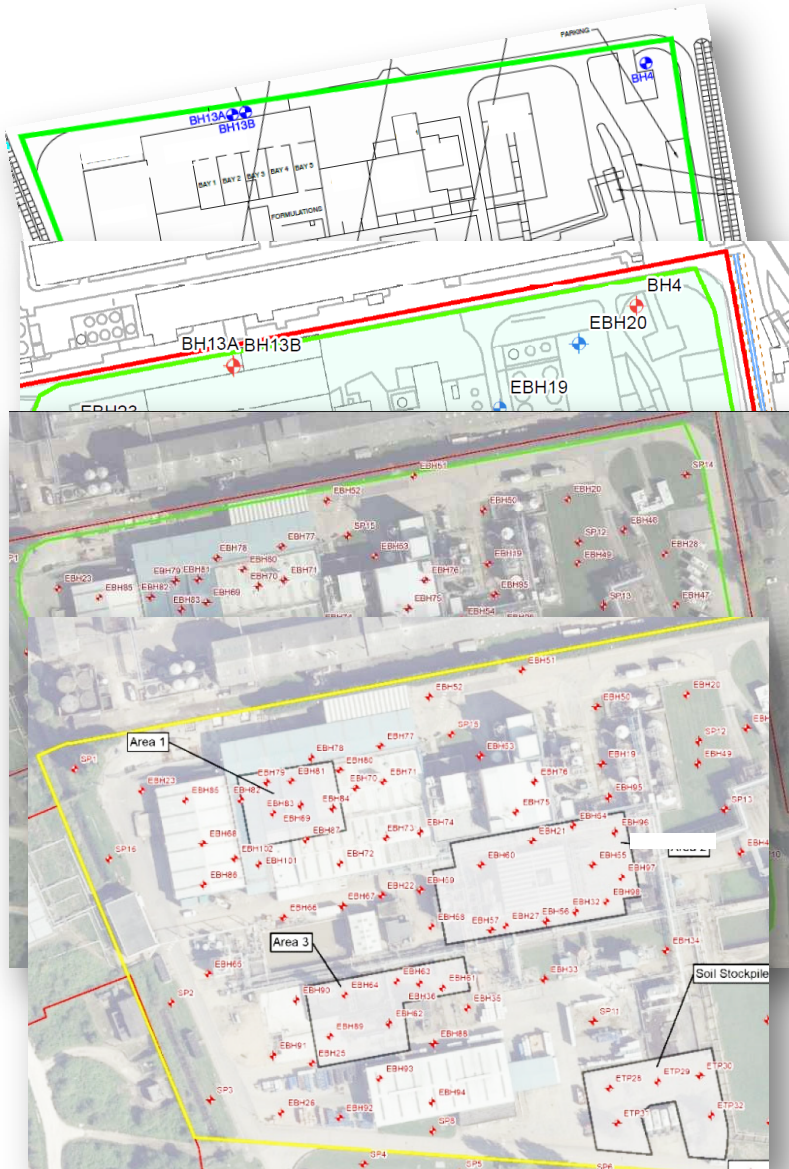


Select
Appropriate
Sustainable
Management
Practices

Implement Sustainable Management Practices
across activities as appropriate

Report
Benefits of
Sustainable
Management
Practices

Site Investigation and Risk Assessment

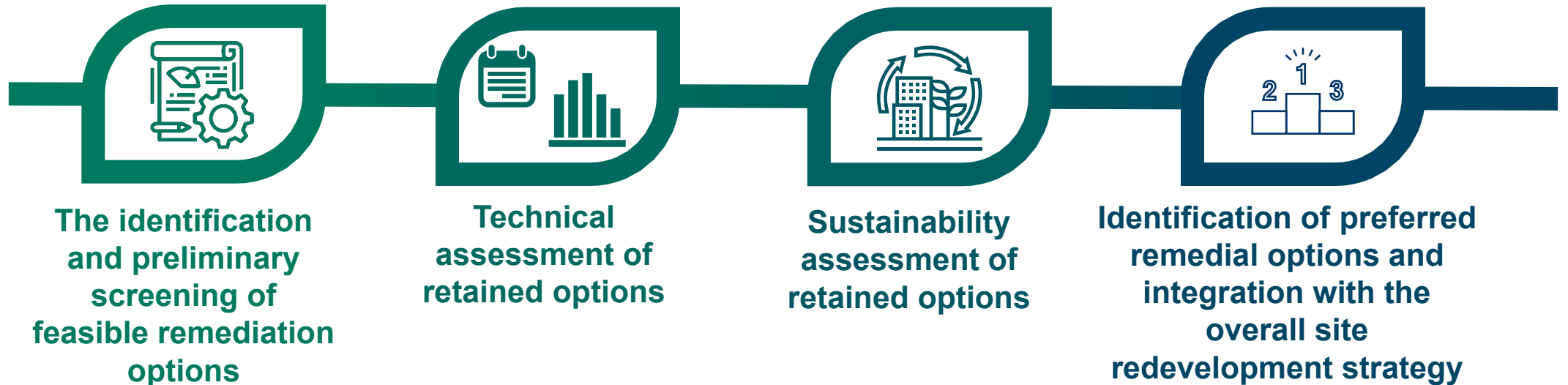


- Iterative approach with multiple phases of investigation
- Site Specific Risk Assessment
- Adopted Sustainable Management Practices (SMP)

SMP highlights

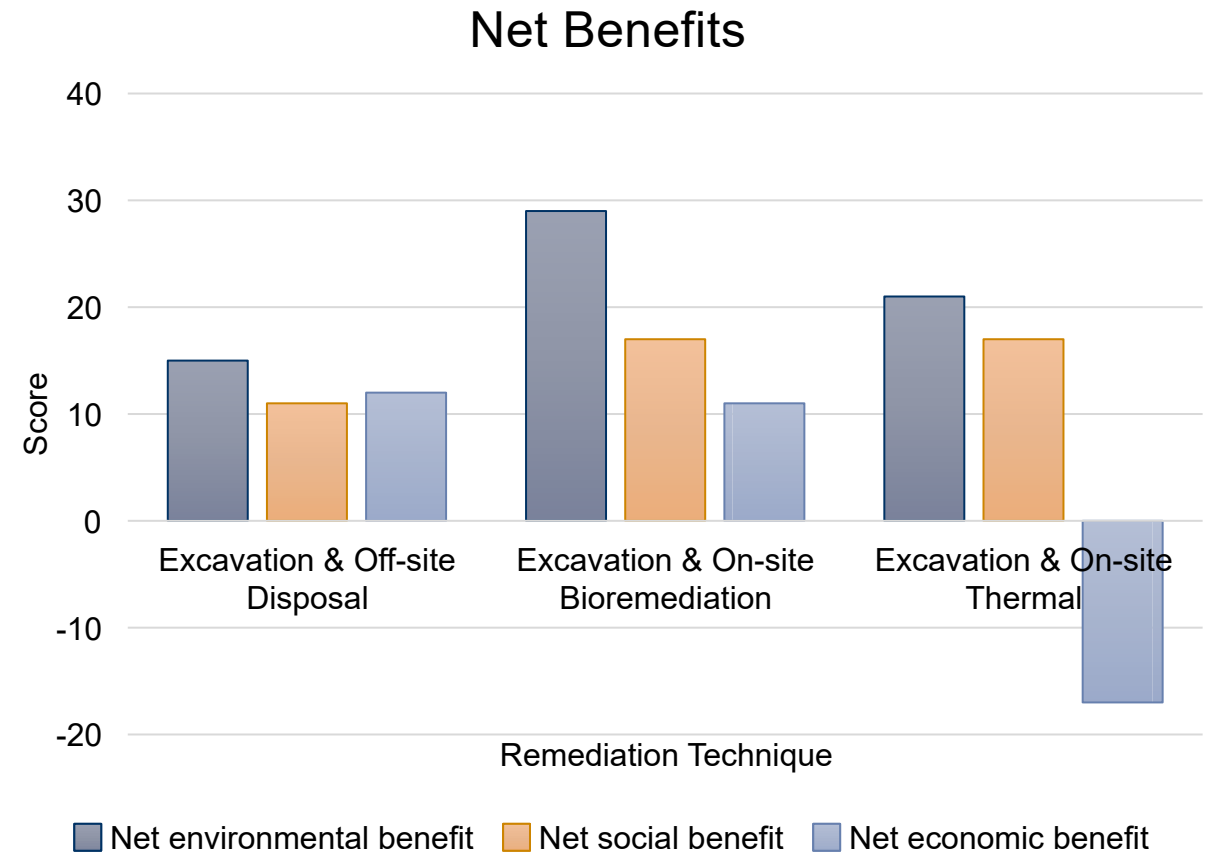
- Adopted a high resolution site characterisation approach to the extent practical
- Gathered site specific data for risk assessment
- Undertook Site specific risk assessment to derive remedial criteria
 - Human Health Future Use
 - Controlled waters

Remedial Options Appraisal



Sustainability assessment of retained options

- Identified and agreed relevant environmental, social and economic indicators
- Weighted indicators to reflect site specific circumstances and client sustainability policies
 - Carbon Emissions
 - Zero waste to landfill
 - Soil Health
 - Economic costs
- Undertook semi quantitative multi criteria analysis appraisal (Tier 2 assessment in SuRF UK Framework) of retained technically feasible technologies
- Reviewed and agreed with regulatory authorities



Contractor Procurement Process



1 Environmental responsibility of the proposed technologies

2 The use of methods, materials or construction measures that generate less waste or pollution, are less toxic, are less detrimental to the health and well-being of personnel and any building occupants

3 Methods that consume fewer materials or less energy, water or chemicals in their production, packaging, use and disposal

4 Methods that promote the circular economy and minimise off-site disposal to landfill

5 Methods that produce fewer pollutants and greenhouse gases, or that otherwise have a reduced environmental impact as compared to traditional materials or remediation or construction measures

SMP highlights

- Included Sustainability in procurement process
- As part of methodology given 25% weighting in overall evaluation
- Encouraged early identification of good practice and planning for implementation phase

Remediation Implementation Phase

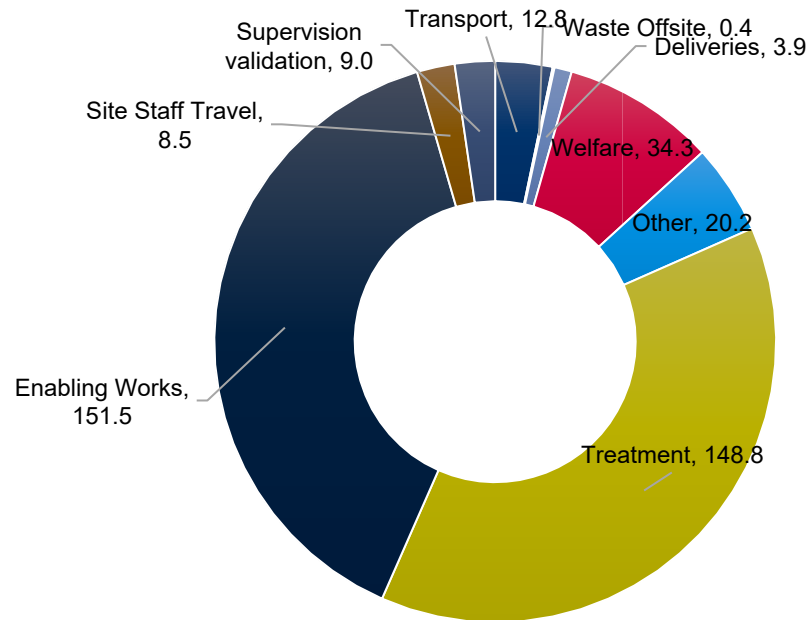
- Comprehensive list of generic SMPs developed by Contractor
- Those SMPs brought forward for use as part of the project were mapped to the project sustainability indicators
- Draft SMPs review by project team with appropriate actions incorporated into the Contractor's activities
- Regular reviews of completed tasks with quantitative and semi-quantitative analysis completed to support the beneficial outcomes of specific SMPs



SMP highlights

- Local procurement of amendments for bioremediation
- Sustainable use of existing infrastructure
- Zero waste – aggressive targeting of peat
- Social, Environmental & Economic benefits

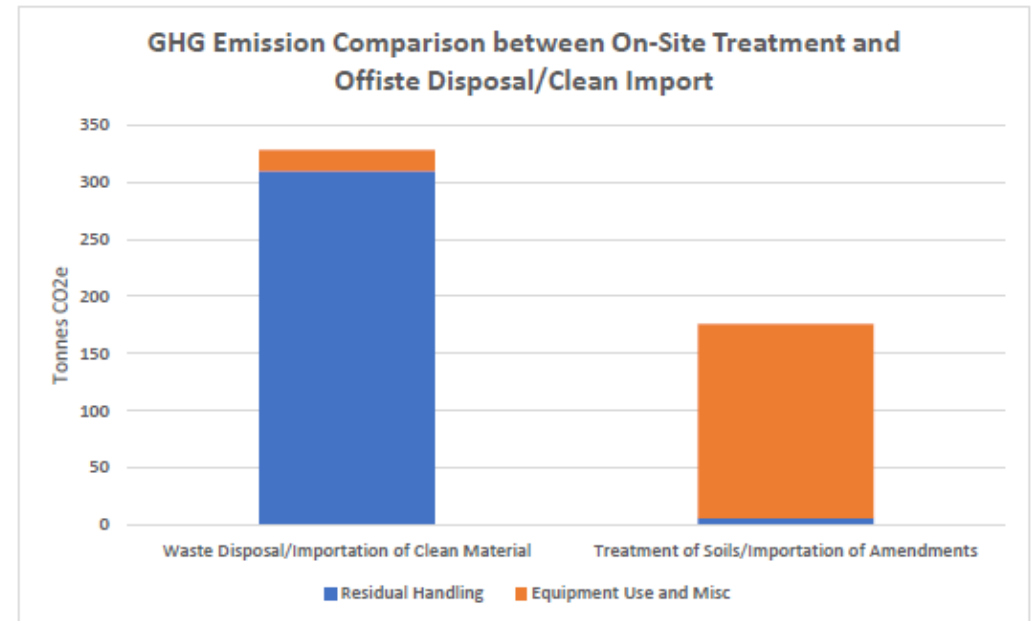
GHG Emissions Assessment



All emissions in metric tonnes

With the exception of 9 tonnes of spent activated carbon, general waste and refuse and a <25 kg of asbestos containing material all other wastes were treated, recovered and reused on site.

- SMP procurement strategy resulted in 50% of total deliveries from new suppliers identified within 10 miles of the site ~8 and 10 tonnes GHG emission savings.
- On site bioremediation generated approximately 50% less GHG emission (165 tonnes) compared to the modelled offsite solution (326 tonnes)





Lessons Learned & Recommendations

Lessons Learned & Recommendations

- Sustainability is site specific but applying a consistent set of principles within a framework can help optimise and maximise potential sustainability gains irrespective of other project boundaries
- The deployment of SMPs for this project has resulted in a number of significant sustainability gains and successes.
- Combined, relevant SMPs have led to a reduction of waste, reduction of GHG emissions, better engagement with local businesses and a reduction of costs.
- Early acknowledgement and engagement through the life cycle of the project is recommended



Thank you!

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