



Lime Down

Solar Park

Environmental Statement

Volume 3, Appendix 19-9: Preliminary Risk Assessment Approach & Methodology

September 2025

Revision 1

Planning Inspectorate Reference: EN010168

Document Reference: APP/6.3

APFP Regulation 5(2)(a)



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Appendix 19-9: Preliminary Risk Assessment Approach and Methodology

1.1 Introduction

1.1.1 Geosyntec Consultants Limited (Geosyntec) was commissioned by the Applicant to produce a Preliminary Risk Assessment to accompany the Ground Conditions chapter of the ES for the Scheme. The Site location is illustrated by Figure 1.

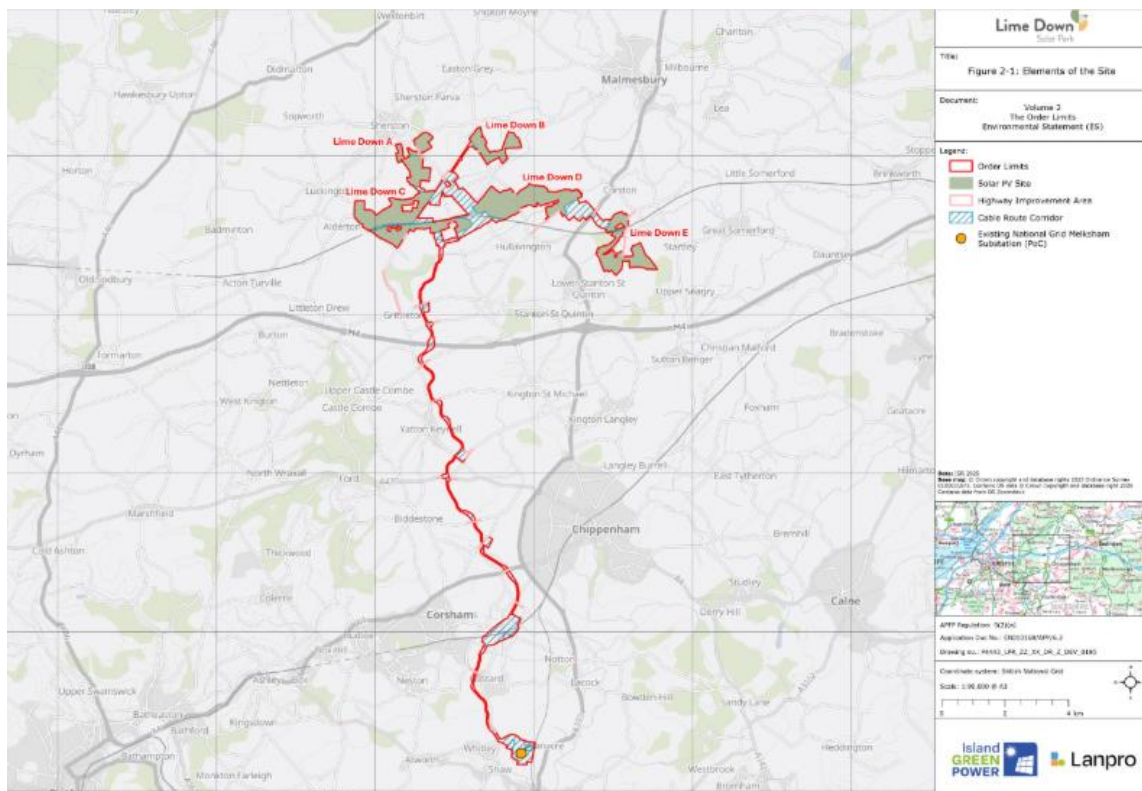


Figure 1 Map with Lime Down A-E sites and Melksham Station outlined in red. Potential Cable Corridor shaded in orange.

Objectives

1.1.2 The primary objectives of these PRA are to:

- Determine whether potentially contaminative uses have taken place within, or in close proximity to, the Site which could have led to the contamination of underlying soils or groundwater; and
- to understand the effects of the geological conditions and site activities on the geotechnical properties for the Scheme.

1.1.3 These reports have been prepared in accordance with the technical guidance and procedures described in the:

- UK Government guidance Land Contamination: Risk Management (2019);

- British Standard (BS) 5930:2015 (as amended) Code of Practice for Site Investigations (BSI);
- BS:EN 1997 Eurocode 7 – Geotechnical Design (BSI); and
- BS 10175:2011 (as amended) Investigation of Potentially Contaminated Sites – Code of Practice (BSI).

1.2 Conceptual Site Model and Preliminary Risk Assessment

Introduction

- 1.2.1 This section will lay out the risk assessment approach to utilised in the assessment. It aligns with the approach recommended in Section 1.1.7 above.

Assessment Framework

- 1.2.2 Environmental liabilities can arise through provisions contained within legislation including Part 2A of the Environmental Protection Act 1990 (EPA 1990), the Environmental Damage (Prevention and Remediation) Regulations 2015, the Water Resources Act 1991, the Environmental Permitting Regulations 2016 and the Water Act 2003.
- 1.2.3 Current good practice recommends that the determination of health hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Statutory Guidance to Part 2A (2012) and Land Contamination: Risk Management (LCRM).
- 1.2.4 The “suitable for use” approach is adopted for the assessment of contaminated land where remedial measures are undertaken for any unacceptable risks to human health or the environment, considering the use (or proposed use) of the land in question and the environmental setting.
- 1.2.5 The risk assessment process for environmental contaminants is based on a source-pathway-receptor analysis. These terms can be defined as follows:
- **Source:** hazardous substance that has the potential to cause adverse impacts; and
 - **Pathway:** route whereby a hazardous substance may come into contact with the receptor: examples include ingestion of contaminated soil and leaching of contaminants from soil into watercourses; and
 - **Receptor:** target that may be affected by contamination: examples include human occupants/users of site, water resources (surface waters or groundwater), or structures.
- 1.2.6 For a risk to be present, there must be a viable contaminant linkage; i.e. a mechanism whereby a source impacts on a sensitive receptor via a pathway.

- 1.2.7 The following sections details the initial Conceptual Site Model (CSM) which has been developed for the Site with a view to assessing the potential risks/liabilities and constraints associated with the Site in its current condition prior to any proposed redevelopment. Risks associated with the proposed redevelopment have also been assessed based on an appropriate future land use scenario, including any potential sources of contamination, potential receptors and potential contaminant pathways identified during this desk-based assessment.

Risk Assessment Principles

- 1.2.8 Current good practice recommends that the determination of hazards due to contaminated land is based on the principle of risk assessment, as outlined in the Environment Agency guidance on LCRM.
- 1.2.9 Assessments of risks associated with each of these contaminant linkages are discussed in the following sections.
- 1.2.10 Using criteria broadly based on those presented in the Construction Industry Research and Information Association publication Research & Development (R&D 66) (National House Building Council (NHBC)/Environment Agency/Chartered Institute of Environmental Health (CIEH), 2008), the magnitude of the risk associated with potential contamination at the Site has been assessed. To do this an estimate is made of:
- The magnitude of the potential consequence (i.e. severity);
 - The magnitude of probability (i.e. likelihood).
- 1.2.11 The severity of the risk is classified according to the criteria in **Table 1**.

Risk Assessment Framework

- 1.2.12 In order to appropriately estimate the risk, the guidance held within R&D 66: Annex 4 (Qualitative Risk Assessment) will be followed. This will allow for a defensible and reproducible assessment of the magnitude of consequence and severity for any identified hazard. Annex 4 contains definitions and examples of what constitutes different magnitudes of consequence (A4.3 Classification of Consequence) and probability (A4.4 Classification of Probability) and these tables have been reproduced below:

Table 1: Description of Severity of Risk

Classification	Definition	Examples
Severe	<ul style="list-style-type: none"> • Highly elevated concentrations likely to result in “significant harm” to human health as defined by the EPA 1990, Part 2A, if exposure occurs. 	<ul style="list-style-type: none"> • Significant harm to humans is defined in circular 01/2006 as death, disease serious injury, genetic mutation, birth defects or the impairment of reproductive functions.

Classification	Definition	Examples
	<ul style="list-style-type: none"> • Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. • Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population. • Catastrophic damage to crops, buildings or property 	<ul style="list-style-type: none"> • Major fish kill in surface water from large spillage of contaminants from site. • Highly elevated concentrations of List I and II substances present in groundwater close to small potable abstraction (high sensitivity).
Medium	<ul style="list-style-type: none"> • Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs. • Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. • Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. • Significant damage to crops, buildings or property 	<ul style="list-style-type: none"> • Significant harm to humans is defined in circular 01/2006 as death, disease, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. • Ingress of contaminants through plastic potable water pipes.
Mild	<ul style="list-style-type: none"> • Exposure to human health unlikely to lead to "significant harm". • Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce. • Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its 	<ul style="list-style-type: none"> • Exposure could lead to slight short-term effects (e.g. mild skin rash). • Surface spalling of concrete.

Classification	Definition	Examples
	<p>functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.</p> <ul style="list-style-type: none"> Minor damage to crops, buildings or property 	
Minor	<ul style="list-style-type: none"> No measurable effect on humans. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services. 	<ul style="list-style-type: none"> The loss of plants in a landscaping scheme. Discoloration of concrete.

1.2.13 The probability of the risk occurring is classified according to the criteria in **Table 2**.

Table 2: Likelihood of Risk Occurrence

Category	Definition	Examples
High	There is pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution	<p>a) <i>Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden.</i></p> <p>b) <i>Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50 years.</i></p>
Likely	There is pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	<p>a) <i>Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space.</i></p> <p>b) <i>Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.</i></p>
Low	There is pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event	<p>a) <i>Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space.</i></p>

Category	Definition	Examples
	would take place, and is less likely in the shorter term	<i>b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.</i>
Unlikely	There is pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.	<i>a) Elevated concentrations of toxic contaminants are present below hardstanding.</i> <i>b) Light industrial unit</i>

- 1.2.14 An overall evaluation of the level of risk is gained from a comparison of the severity and probability, as shown in **Table 3**.

Table 3: Risk Based on Comparison of Likelihood and Severity

		Severity			
Likelihood		Severe	Medium	Mild	Minor
	HIGH	Very High	High	Moderate	Low
	LIKELY	High	Moderate	Moderate/Low	Low
	LOW	Moderate	Moderate/Low	Low	Very Low
	UNLIKELY	Moderate/Low	Low	Very Low	Very Low

- 1.2.15 Annex 4 then describes the classified risks in Section A4.5.1 as follows:

Very high risk

- 1.2.16 There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.

High risk

- 1.2.17 Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a

matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.

Moderate risk

- 1.2.18 It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

Low risk

- 1.2.19 It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

Very low risk

- 1.2.20 It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

No potential risk

- 1.2.21 There is no potential risk if no pollution linkage has been established

1.3 ES Assessment of Impact Methodology

- 1.3.1 The value, magnitude and significance tables presented below which are generally based on the procedure for assessing impacts described in the Design Manual for Roads and Bridges (DMRB), Volume 11, Part 10, HD 45/09 Road Drainage and the Water Environment (Highways Agency 2009).
- 1.3.2 The value (importance) of an attribute ranges from Very High to Negligible and is dependent on the site or feature's sensitivity, importance and conservation value. The criteria for determining the value of an attribute is given in **Table 4**.
- 1.3.3 The magnitude of impact on an attribute ranges from Major Adverse to Major Beneficial. The criteria for determining the magnitude of impact on an attribute is given in **Table 5**.

The significance of potential impact on an attribute is dependent on its assigned value and the magnitude of impact and is broadly categorised according to DMRB (ANNEX IV) Significance of Potential Effects, as presented in **Table 6**.

Table 4: Estimating the Importance of Attributes

Importance/Value/Sensitivity	Criteria	Feature/Receptor/Resource	Indicator of Quality
Very High	Very rare and of high national and regional importance with no potential for replacement	Surface Water	<ul style="list-style-type: none"> Water Framework Directive Class 'High' EC Designated Salmonid / Cyprinid fishery Site protected by International or UK legislation: Special Area of Conservation, Special Protection Area, Ramsar site or Site of Special Scientific Interest). Species protected by EC legislation
		Groundwater	<ul style="list-style-type: none"> Environment Agency 'Principal Aquifer' Principal aquifer providing a regionally important resource or supporting site protected under UK habitat and potable water abstraction legislation Source Protection Zone 1 – Inner protection zone
		Geology/Soils	<ul style="list-style-type: none"> Site protected by International or UK legislation (World Heritage Sites, Geopark, Site of Special Scientific Interest.) For contaminated land this would relate to a high to very high risk.
		Agriculture	<ul style="list-style-type: none"> High quality agricultural soils (Grade 1)
High	Medium national and high regional importance with limited potential for replacement	Surface Water	<ul style="list-style-type: none"> Water Framework Directive Class 'Good' Species protected under UK habitat legislation
		Groundwater	<ul style="list-style-type: none"> Environment Agency 'Principal Aquifer' Principal aquifer providing locally important resource or supporting river ecosystem Source Protection Zone 2 – Outer protection zone
		Geology/Soils	<ul style="list-style-type: none"> For contaminated land this would relate to a moderate risk. Site of local geological importance (Local Geological Site – previously Regionally Important Geological Site)
		Agriculture	<ul style="list-style-type: none"> Good quality agricultural soils(Grade 2 and 3a)

Importance/Value/Sensitivity	Criteria	Feature/Receptor/Resource	Indicator of Quality
Medium	Low regional and high local importance with some potential for replacement	Surface Water	<ul style="list-style-type: none"> Water Framework Directive Class 'Moderate' Non EC Designated fishery Sites designated by local authority as having local conservation status
		Groundwater	<ul style="list-style-type: none"> Environment Agency 'Secondary Aquifer' Aquifer providing water for agricultural or industrial use with limited connection to surface water Source Protection Zone 3 – Source catchment protection zone
		Geology/Soils	<ul style="list-style-type: none"> For contaminated land this would relate to a low risk. Mineral Safeguarding Area
		Agriculture	<ul style="list-style-type: none"> Moderate quality agricultural soils (Grade 3b)
Low	Local importance with potential for replacement	Surface Water	<ul style="list-style-type: none"> Water Framework Directive Class 'Poor' Low grade or common habitats with no conservation status
		Groundwater	<ul style="list-style-type: none"> Environment Agency 'Unproductive strata'
		Geology/Soils	<ul style="list-style-type: none"> Sites with little local geological/soils interest. For contaminated land this would relate to a very low risk.
		Agriculture	<ul style="list-style-type: none"> Poor quality agricultural soils (Grade 4)
Negligible	Very low importance and rarity, local scale	Hydrology	<ul style="list-style-type: none"> Water Framework Directive Class 'Poor' Low grade or common habitats with no conservation status
		Hydrogeology	<ul style="list-style-type: none"> Environment Agency 'Unproductive strata'
		Geomorphology	<ul style="list-style-type: none"> Sites with no local geological/soils interest. For contaminated land this would relate to a negligible risk.
		Agriculture	<ul style="list-style-type: none"> Very poor quality agricultural soils (Grade 5)

Table 5: Estimating the Magnitude of Impact on an Attribute

Magnitude	Criteria	Aspect	Typical Examples
Major Adverse	Results in loss of attribute and/or quality and integrity of the attribute	Surface Water	<ul style="list-style-type: none"> Fundamental change to hydrological conditions including deterioration in water quality Loss or extensive damage to a fishery Loss or extensive damage to a designated conservation site High risk of pollution from surface water run-off or accidental spillages
		Groundwater	<ul style="list-style-type: none"> Loss of, or extensive change to, an aquifer Potential high risk of pollution to groundwater Loss of, or extensive change to, groundwater supported designated wetlands
		Geology/Soils	<ul style="list-style-type: none"> Loss/sterilisation of the resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
		Agriculture	<ul style="list-style-type: none"> Loss of over 50 ha of 'best and most versatile agricultural land' Grades 1, 2 and 3a. Damage to/ or loss of all topsoil resource.
Moderate Adverse	Results in effect on integrity of attribute, or loss of part of attribute	Surface Water	<ul style="list-style-type: none"> Detectable but non-fundamental change to hydrological conditions Some deterioration in water quality likely to temporarily affect sensitive receptors Partial loss in productivity of a fishery Medium risk of pollution from surface water run-off or accidental spillages
		Groundwater	<ul style="list-style-type: none"> Partial loss or change to an aquifer Potential medium risk of pollution to groundwater Partial loss of the integrity of groundwater supported designated wetlands
		Geology/Soils	<ul style="list-style-type: none"> The site's integrity will not be adversely affected, but the Scheme may lead to a loss of or damage to key characteristics, features or attributes or partial sterilisation.
		Agriculture	<ul style="list-style-type: none"> Loss of between 20 and 50 ha of 'best and most versatile agricultural land' Grades 1, 2 and 3a. Damage to/ or loss of half of topsoil resource

Magnitude	Criteria	Aspect	Typical Examples
Minor Adverse	Results in some measurable change in attributes quality or vulnerability	Surface Water	<ul style="list-style-type: none"> • Detectable but minor change to hydrological conditions • Slight deterioration in water quality unlikely to affect sensitive receptors • Low risk of pollution from surface water run-off or accidental spillages
		Groundwater	<ul style="list-style-type: none"> • Potential low risk of pollution to groundwater • Minor effects on groundwater supported wetlands
		Geology/Soils	<ul style="list-style-type: none"> • A measurable minor negative impact on key characteristics, features or attributes is evident.
		Agriculture	<ul style="list-style-type: none"> • Loss of less than 20 ha of 'best and most versatile agricultural land' Grades 1, 2 and 3a or the loss of any quantity of land not considered 'best and most versatile agricultural land' Grades 3b, 4 or 5. • Re-use of all topsoil resource within the development. • Loss of less than 20 ha of 'best and most versatile agricultural land' Grades 1, 2 and 3a or the loss of any quantity of land not considered 'best and most versatile agricultural land' Grades 3b, 4 or 5. • Re-use of all topsoil resource within the development.
Negligible	Results in effect on attribute, but of insufficient magnitude to affect the use or integrity	Surface Water	<ul style="list-style-type: none"> • Undetectable change in hydrological conditions including water quality • The Scheme is unlikely to affect the integrity of the water environment • Very low risk of pollution from surface water run-off or accidental spillages
		Groundwater	<ul style="list-style-type: none"> • No measurable impact upon an aquifer and risk of pollution from spillages
		Geology/Soils	<ul style="list-style-type: none"> • Minor alteration to one or more characteristics, features or elements or no observable impact.
		Agriculture	<ul style="list-style-type: none"> • No loss of agricultural land. • Minor disturbance to soils.
Minor Beneficial	Results in some beneficial effect on attribute or a reduced risk of	Surface Water	<ul style="list-style-type: none"> • A measurable minor improvement to water quality
		Groundwater	<ul style="list-style-type: none"> • Calculated reduction in existing spillage risk by 50% or more to an aquifer (when existing spillage risk <1% annually)
		Geology/Soils	<ul style="list-style-type: none"> • A measurable minor positive impact on key characteristics, features or attributes is evident.

Magnitude	Criteria	Aspect	Typical Examples
	negative effect occurring		
Moderate Beneficial	Results in moderate improvement of attribute quality	Surface Water	• A moderate improvement to water quality
		Groundwater	• Calculated reduction in existing spillage risk by 50% or more (when existing spillage risk is >1% annually)
		Geology/Soils	• A moderate positive impact on key characteristics, features or attributes is evident.
Major Beneficial	Results in major improvement of attribute quality	Surface Water	• A major improvement to water quality
		Groundwater	<ul style="list-style-type: none"> • Removal of existing polluting discharge to an aquifer or removing the likelihood of polluting discharges occurring • Recharge of an aquifer
		Geology/Soils	• A major positive impact on key characteristics, features or attributes is evident.

Table 6: Estimating the Significance of Potential Effects

Environmental Value (sensitivity) (from Table 11.2)	Magnitude of Impact (from Table 11.3)					
		Major	Moderate	Minor	Negligible	No Change
	Very High	Very Large	Large or Very Large	Moderate or Large	Slight	Neutral
	High	Large or Very Large	Moderate or Large	Slight or Moderate	Slight	Neutral
	Medium	Moderate or Large	Moderate	Slight	Neutral or Slight	Neutral
	Low	Slight or Moderate	Slight	Neutral or Slight	Neutral or Slight	Neutral

Note: Shaded boxes indicate a 'Significant Effect'. All others are 'Not Significant'. Where a choice of two impact significance descriptors is available, only one should be chosen. This allows for professional judgement and discrimination in assessing impacts.

- 1.3.4 The estimation of significance of effects as displayed in **Table 6** (DMRB 2009) is further explained in **Table 7**.
- 1.3.5 The potential significance of these effects will be reported in line with **Table 7**, which is broadly based on guidelines given in R&D Publication 66 (NHBC and Environment Agency, 2008). The rationale for the assessment of significance is based on the risk assessment process and therefore, takes account of the different sensitivities (importance) of the potential receptors.
- 1.3.6 The preliminary potential effects upon the Scheme from contaminated soils have been assessed. These effects have been identified by a qualitative assessment using the 'source-pathway-receptor' approach to determine the potential risks posed to the future users and permanent reinstatement of the buildings/infrastructure of the Scheme.

Table 7: Ground Contamination Assessment Significance Criteria

Significance	Rationale for assessment of significance
Very Large Adverse	<p>These represent key factors in the decision making process. These effects are generally but not exclusively associated with sites or features of international, national importance that are likely to suffer a most damaging impact and loss of resource integrity.</p> <p>Where the Scheme would result in degradation of the geological, soil, hydrogeological or contamination setting because it results in</p>

Significance	Rationale for assessment of significance
	<p>predicted very significant adverse impacts on at least one attribute. More than one attribute may be affected by a single project and each should be assessed and reported separately. Examples have been provided below.</p> <p>Human Health:</p> <ul style="list-style-type: none"> • Highly elevated concentrations likely to result in “significant harm” to human health as defined by the EPA 1990, Part 2A, if exposure occurs; and/or • Equivalent to a Local Authority Category 1 classification under the DEFRA (2012) Part 2A Contaminated Land Statutory Guidance. <p>Ecology:</p> <ul style="list-style-type: none"> • Major damage to aquatic or other ecosystems which is likely to result in a substantial adverse change in its functioning. <p>Controlled Waters:</p> <ul style="list-style-type: none"> • Equivalent to EA Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce; and/or • Catastrophic damage to crops, buildings or property. <p>Geology:</p> <ul style="list-style-type: none"> • Loss of sites of geological importance; and/or • Major damage to soils.
Large Adverse	<p>These effects are considered to be very important considerations and are likely to be material in the decision-making process.</p> <p>Where the proposal would result in a degradation of the water environment because it results in predicted highly significant adverse impacts on a water attribute. More than one attribute may be affected by a single project and each should be assessed and reported separately. For example:</p> <ul style="list-style-type: none"> • Elevated concentrations which could result in “significant harm” to human health as defined by the EPA 1990, Part 2A if exposure occurs; • Equivalent to a Local Authority Category 2 classification under the DEFRA (2012) Part 2A Contaminated Land Statutory Guidance; • Significant damage to aquatic or other ecosystems, including soils and geology which may result in a substantial adverse change in its functioning; • Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction

Significance	Rationale for assessment of significance
	<p>in amenity value or significant damage to agriculture or commerce; and</p> <ul style="list-style-type: none"> • Significant damage to crops, buildings or property.
Moderate Adverse	<p>These effects may be important but are not likely to be decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.</p> <ul style="list-style-type: none"> • Exposure to human health unlikely to lead to “significant harm”. • Equivalent to a Local Authority Category 3 classification under the DEFRA (2012) Part 2A Contaminated Land Statutory Guidance. • Minor or short lived damage to aquatic or other ecosystems, including soils and geology which is unlikely to result in a substantial adverse change in its functioning. • Equivalent to EA Category 3 pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce. • Minor damage to crops, buildings or property.
Slight Adverse	<p>These effects may be raised as local factors but are unlikely to be critical in the decision making process. They are important in enhancing the ultimate design of the Scheme.</p>
Neutral	<ul style="list-style-type: none"> • No measurable effect on humans. • Equivalent to a Local Authority Category 4 classification under the DEFRA (2012) Part 2A Contaminated Land Statutory Guidance. • Repairable effects of damage to soils, geology, buildings, structure and services. • Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.
Slight Beneficial	<p>Situations where the proposal provides an opportunity to enhance the water environment or provide an improved level of protection to an attribute. More than one attribute may be affected by a single project and each should be assessed and reported separately. Examples have been provided below.</p> <p>Surface Water:</p> <ul style="list-style-type: none"> • Method A assessment of either soluble or sediment-bound pollutants becomes ‘Pass’ from previous ‘Fail’ condition for existing discharges; and/or • Reduction by 50% or more in existing pollution risk from spillages into High to Poor watercourses (when existing spillage risk is <1%). <p>Groundwater:</p> <ul style="list-style-type: none"> • Reduction by 50% or more in existing pollution risk from spillages into an aquifer (when existing spillage risk is <1%). <p>Flood Risk:</p>

Significance	Rationale for assessment of significance
	<ul style="list-style-type: none"> A reduction in peak flood level (1% annual probability) >10 mm resulting in a reduced risk of flooding to 1-100 residential properties.
Moderate Beneficial	<p>These effects may be important but are not likely to be decision-making factors. They occur where the Scheme provides an opportunity to enhance the water environment because it results in a moderate improvement for an attribute. More than one attribute may be affected by a single project and each should be assessed and reported separately. Examples are provided below.</p> <p>Surface Water:</p> <ul style="list-style-type: none"> Method A assessment of both soluble and sediment-bound pollutants becomes 'Pass' from previous 'Refer' or 'Fail' condition for existing discharges; Reduction by 50% or more in likelihood of pollution to watercourses from spillages from existing discharges through retrofitting of pollution control to outfalls into a High to Poor watercourse (existing risk >1%); and/or Recharge of aquifer through provision of treated discharges to ground resulting in measurable improvements to a connected site/habitat of local nature conservation value i.e. Local Nature Reserve. <p>Groundwater</p> <ul style="list-style-type: none"> Reduction by 50% or more in existing likelihood of pollution arising from a spillage to an aquifer through retrofitting of pollution control (existing risk >1%).
Large Beneficial	<p>These effects are considered to be very important considerations and are likely to be material in the decision-making process.</p> <p>Schemes could have a large positive impact if it is predicted that it will result in a 'very' or 'highly' significant improvement to a water attribute(s), with insignificant adverse impacts on other water attributes. More than one attribute may be affected by a single project and each should be assessed and reported separately. Examples have been provided below.</p> <p>Surface Water:</p> <ul style="list-style-type: none"> Removal of an existing polluting discharge through provision of pollution prevention measures, or any other measure, affecting a site/habitat protected under EC or UK legislation (SAC, SPA, Ramsar site, SSSI, WPZ, salmonid water); and/or Reduction by 50% or more in the existing likelihood of pollution arising from a spillage affecting a site/habitat protected under EC or UK legislation (SAC, SPA, Ramsar site, SSSI, WPZ, salmonid water) where existing risk >1%. <p>Groundwater:</p>

Significance	Rationale for assessment of significance
	<ul style="list-style-type: none"> • Removal of an existing polluting discharge within Zone 1 and 2 of a SPZ and/or a principal aquifer; • Reduction by 50% or more in the existing likelihood of pollution arising from a spillage at discharge points within Zone 1 or 2 of a SPZ, principal aquifer and/or a site supporting a habitat protected under habitat legislation (existing risk >1%); and/or • Recharge of aquifer through provision of treated discharges to ground resulting in measurable improvements to a connected site/habitat protected under EC or UK legislation (SAC, SPA, Ramsar site, SSSI, WPZ, salmonid water).

- 1.3.7 The assessment of effects for soils, geology, groundwater and contaminated land have been assessed taking standard mitigation measures and good practice construction techniques into account (embedded mitigation). Effects that remain once embedded mitigation measures have been taken into consideration are residual effects.