The Keadby 3 Low Carbon Gas Power Station Project

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The Keadby 3 (Carbon Capture Equipped Gas Fired Generating Station) Order

Land at and in the vicinity of the Keadby Power Station site, Trentside, Keadby, North Lincolnshire

Environmental Statement

Volume II - Appendix 13C: Potential Areas of Contamination Further Risk and Impact Assessment

The Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

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GLOSSARY

Abbreviation	Description
CSM	Conceptual Site Model
ES	Environmental Statement
LWS	Local Wildlife Site
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest
SVOC	Semi Volatile Organic Compounds
TPH	Total Petroleum Hydrocarbons
VOC	Volatile Organic Compounds

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1.0 INTRODUCTION

1.1 Overview

1.1.1 This Technical Appendix supplements **Chapter 13**: Geology, Hydrogeology and Land Contamination (ES Volume I – **Application Document Ref. 6.2**) and describes the additional details for the approach to assessment for land quality for the Proposed Development.

1.1.2 In accordance with the screening methodology presented in Section 13.3 of **Chapter 13**: Geology, Hydrogeology and Land Contamination (ES Volume I - **Application Document Ref. 6.2**), a baseline risk score has been assigned to each of these areas and is presented in Table 1 (below). It is also visually represented on **Figure 13.2** (ES Volume III - **Application Document Ref. 6.4**). It has been assumed at this stage that excavation (cut) may occur anywhere within the Proposed Development Site boundary.

Table 1: Potential areas of contamination

Site ID	Site name	Proximity zone[1]	Land use class[2]	Relationship to cut/ fill/ construction work	Baseline risk score[3]
S1	Keadby Power Station (formerly coal fired, current gas fired). Keadby Power Landfill (deposited waste included inert and industrial waste) also within S1 area, along with numerous tanks and former railway (southern-most boundary) and former farms (west and north).	Zone 1	Class 3	Cut	5
S2	Historic Landfill and BGS Recorded Landfill Site - Keadby Power Station. Deposited waste	Zone 1	Class 3	Cut	5

Site ID	Site name	Proximity zone[1]	Land use class[2]	Relationship to cut/ fill/ construction work	Baseline risk score[3]
	included inert and industrial waste.				
S3	Historic Landfill and Licensed Waste Management Facility - John Brown Engineering Landfill. Deposited waste included inert and industrial waste, and liquid sludge.	Zone 2	Class 3	Cut	4
S4	Historic Landfill and Licensed Waste Management Facility - Keadby Power Station. Deposited waste included inert, commercial and household waste.	Zone 1	Class 3	Cut	5
S5	Historic Landfill - Keadby Central Electricity Generating Board. Deposited waste included inert, industrial, commercial and household waste, ash (from Keadby Power Station after lagoon settlement), construction, colliery tailings, refractories (from Keadby Power Station), asbestos.	Zone 1	Class 3	Cut	5

Site ID	Site name	Proximity zone[1]	Land use class[2]	Relationship to cut/ fill/ construction work	Baseline risk score[3]
S6	Historic Landfill - Former Keadby Power Station and Registered Landfill - Transtore Industries. Deposited waste included industrial, commercial, household and special waste.	Zone 1	Class 3	Cut	5
S7	Historic Landfill Site - PFA Settlement Lagoon	Zone 2	Class 3	Cut	4
S8	Historic Landfill Site - Keadby Power Station	Zone 3	Class 3	Cut	3
S9	Current railway	Zone 2	Class 2	Cut	3
S10	Former railway	Zone 1	Class 2	Cut	4
S11	Former railway sidings and conveyor system	Zone 1	Class 2	Cut	4
S12	Current PD Ports Marina and wharf including current warehouse and former railway and gasometer and infilled pond.	Zone 1	Class 2	Cut	4
S13	Current depot	Zone 3	Class 2	Cut	2
S14	Current pumping station	Zone 1	Class 1	Cut	3
S15	Current pumping station	Zone 2	Class 1	Cut	2
S16	Current pumping station	Zone 3	Class 1	Cut	1
S17	Current pumping station	Zone 3	Class 1	Cut	1

Site ID	Site name	Proximity zone[1]	Land use class[2]	Relationship to cut/ fill/ construction work	Baseline risk score[3]
S18	Current pumping station	Zone 1	Class 1	Cut	3
S19	Former tanks	Zone 1	Class 3	Cut	5
S20	Current Roe Farm	Zone 2	Class 1	Cut	2
S21	Former S L Cleaning Services; commercial cleaning services	Zone 3	Class 2	Cut	2
S22	Potential current tanks	Zone 3	Class 3	Cut	3
S23	Current North Pilfrey Farm	Zone 3	Class 1	Cut	1
S24	Current Pilfrey Farm	Zone 3	Class 1	Cut	1

[1] *Proximity zone definition is included within **Table 1, Appendix 13B** (ES Volume II – **Application Document Ref. 6.3).***

[2] *Land use class types are defined within **Table 2, Appendix 13B** (ES Volume II – **Application Document Ref. 6.3).***

[3] *Baseline risk scoring method is defined within **Table 3, Appendix 13B** (ES Volume II – **Application Document Ref. 6.3).***

2.0 FURTHER RISK AND IMPACT ASSESSMENT

2.1.1 The sites from Table 1 with a baseline risk score of three and above have been considered for further risk and impact assessment in the following tables. The sites from Table 1 with a baseline risk score of two or below are not considered to pose an unacceptable risk within the context of the Proposed Development construction or operation and have therefore been scoped out of any further assessment.

2.1.2 Sites considered for further risk and impact assessment have been grouped where they share similar risk profiles and proximity from the Proposed Development, including whether they are within the Proposed Development Site boundary or outside of it. The risk and impact assessments for each group/ individual site (which are presented and defined in Table 2 below) are presented as a series of tables comprising: a baseline Conceptual Site Model (CSM), a construction phase CSM, a post-construction CSM and then a significance of effect assessment table.

2.1.3 All sites with a baseline risk score of 5 have been assessed on their own, with the exception of S4, S5 and S6. These have been grouped as they are all landfills and they are all located within the same area (to the west of the Proposed Development Site). There is considered to be the same risk outcome for all the receptors assessed from these three sites.

2.1.4 The remaining sites with a baseline risk score of 3 and 4 have been grouped based on their land use type which is either; landfills, industrial sites, railway land or light industrial sites.

2.1.5 Peat deposits are known to be present but could not be identified as a site, or defined area, as the Peat deposits are not mapped. They could therefore be present anywhere within the superficial deposits layer (which has been proven to be up to 1.6m in thickness). Therefore, for Peat and the potential for ground gas, a more generalised risk and impact assessment has been undertaken.

Table 2: Risk and impact assessments for each group/ individual site

Group/ individual site	Site title (site ID) and land use class	Baseline risk score1	Additional Information regarding grouping of the sites
Potential areas of contamination located within the Proposed Development Site boundary			
Baseline risk score 5 industrial site – current Keadby 1 Power Station	Keadby Power Station (formerly coal fired, current gas fired). Keadby Power Landfill (deposited waste included inert and industrial waste) also within S1 area, along with numerous tanks and former railway (southern-most boundary) and former farms (west and north) – (S1) Class 3.	5	S1 is located partly within and partly outside of the Proposed Development Site boundary. As at least half of S1 is located where multiple services, access routes and laydown areas are proposed, it has been assessed as being 'within' the Proposed Development Site boundary.
Baseline risk score 5 landfill site – historic landfill	Historic Landfill and BGS Recorded Landfill Site - Keadby Power Station. Deposited waste included inert and industrial waste – (S2) Class 3.	5	S2 is located partly within and partly outside of the Proposed Development Site boundary. As a significant proportion of S2 crosses the northern area of the main development area of the Proposed Power Station and Carbon Capture Site (Proposed PCC Site), it has been assessed as being 'within' the Proposed Development Site boundary.
Baseline risk score 5 industrial site – former tanks	Former tanks – (S19) Class 3.	5	S19 is located entirely within the Proposed Development Site boundary.
Railway site – former railway	Former railway sidings and conveyor system – (S11) Class 2.	4	S11 is located partly within and partly outside the Proposed Development Site boundary. As a significant proportion of

Group/ individual site	Site title (site ID) and land use class	Baseline risk score1	Additional Information regarding grouping of the sites
			S11 crosses the southern area of the main development of the Proposed PCC Site, it has been considered as 'within' the Proposed Development Site boundary.
Industrial site – current marina and wharf including current warehouse, former railway and gasometer and infilled pond	Current PD Ports Marina and wharf including current warehouse, former railway and gasometer and infilled pond – (S12) Class 2.	4	S12 is located partly within and partly outside of the Proposed Development Site boundary. Approximately a third of S12 is located within the Proposed Development Site boundary which has been proposed for a haulage route and transport offloading. As this area does not currently have any access road, it has been assumed that cut operations are likely in this area. Therefore, S12 has been conservatively considered as being 'within' the Proposed Development Site boundary.
Light industrial site – current pumping station	Current pumping station – (S14) Class 1.	3	S14 is located entirely within the Proposed Development Site boundary.
Potential areas of contamination located outside of the Proposed Development Site boundary			
Baseline risk score 5 landfill sites – historic landfills	Historic Landfill and Licensed Waste Management Facility - Keadby Power Station. Deposited waste included inert, commercial and household waste – (S4) Class 3.	5	S4, S5 and S6 extend slightly to within the Proposed Development Site boundary within an area proposed for vehicular site access with a track already present. Therefore, it has been assumed that cut operations are likely to be limited in this area. These sites have been

Group/ individual site	Site title (site ID) and land use class	Baseline risk score1	Additional Information regarding grouping of the sites
	Historic Landfill - Keadby Central Electricity Generating Board. Deposited waste included inert, industrial, commercial and household waste, ash (from Keadby Power Station after lagoon settlement), construction, colliery tailings, refractories (from Keadby Power Station), asbestos – (S5) Class 3.	5	assessed as being 'outside' of the Proposed Development Site boundary.
	Historic Landfill - Former Keadby Power Station and Registered Landfill - Transtore Industries. Deposited waste included inert, industrial, commercial, household and special waste – (S6) Class 3.	5	
Landfill sites – historic landfills	Historic Landfill and Licensed Waste Management Facility - John Brown Engineering Landfill. Deposited waste included inert and industrial waste, and liquid sludge – (S3) Class 3.	4	S3, S7 and S8 are located entirely outside of the Proposed Development Site boundary.
	Historic Landfill Site - Pulverised Fuel Ash (PFA) Settlement Lagoon – (S7) Class 3.	4	

Group/ individual site	Site title (site ID) and land use class	Baseline risk score1	Additional Information regarding grouping of the sites
	Historic Landfill Site - Keadby Power Station – (S8) Class 3.	3	
Railway sites – current and former railways	Former railway – (S10) Class 2.	4	S9 is located entirely outside of the Proposed Development Site boundary. S10 extends to slightly within the Proposed Development Site boundary which is an area proposed for canal water supply connection works. It is assumed that cut operations are likely to be limited in this area. Therefore, this site has been assessed as being 'outside' of the Proposed Development Site boundary.
	Current railway – (S9) Class 2.	3	
Industrial site – potential current tanks	Potential current tanks – (S22) Class 3.	3	S22 is located entirely outside of the Proposed Development Site boundary.
Light industrial site – current pumping station	Current pumping station – (S18) Class 1.	3	S18 is located entirely outside of the Proposed Development Site boundary.

[1] *Baseline risk scoring method is defined within* ***Table 3, Appendix 13B*** *(ES Volume II –* ***Application Document Ref. 6.3).***

Table 3: Risk and impact assessment for the current Keadby 1 Power Station (S1) located within the Proposed Development Site boundary

Site ID (IDS)	S1
Site group	Baseline risk score 5 industrial site – current Keadby 1 Power Station located within the Proposed Development Site boundary
Site title (Site ID) and land use class	Keadby Power Station (formerly coal fired, current gas fired). Keadby Power Landfill (deposited waste included inert and industrial waste) also within S1 area, along with numerous tanks and former railway (southern-most boundary) and former farms (west and north) – (S1) Class 3.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Keadby Power Station, Keadby Power Landfill also within S1 area, along	Current commercial users at Keadby 1 Power Station (on-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone	Unnamed drains (on-site) North Soak Drain (on-site)	LWS (all off-site); Keadby Wetland South Soak Drain, Keadby	Keadby 1 Power Station buildings (on-site) Future Keadby 2 Power Station buildings (off-site)

with numerous tanks and former railway and former farms – (S1)	Future commercial users at Keadby 2 Power Station (off-site)	Formation) – Secondary B aquifer Groundwater abstraction (not potable) (on-site)	Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site) South Soak Drain (off-site) Two surface water abstractions (not potable) (off-site, adjacent to the south)	Stainforth and Keadby Canal Corridor	Future Keadby 3 Power Station foundations and services (on-site)

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S1 is located partly within and partly outside of the Proposed Development Site boundary. As at least half of S1 is located where multiple services, access routes and laydown areas are proposed, it has been assessed as being 'within' the Proposed Development Site boundary.

Table 4: Baseline CSM: current Keadby 1 Power Station (S1) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Ground gas (from landfill located within the S1 boundary, and any areas of significant Made Ground). Landfill known to contain inert and industrial waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids,	On-site users – Commercial users at Keadby 1 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Medium	Low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (on-site)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
alkalis, organic compounds, inorganic compounds, asbestos, TPH, PAH, solvents, lubricants, fuel oils, VOC, SVOC, timber and water treatment chemicals, PCB, methane, hydrogen sulphide and carbon dioxide.	Controlled waters – surface waters – North Soak Drain (on-site) Two surface water abstractions (not potable) (off-site, adjacent to the south)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – surface waters – Unnamed drains (on-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal, South Soak Drain (off-site)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Ecological receptors – Keadby Wetland LWS, South Soak Drain, Keadby LWS, Stainforth and Keadby	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Canal Corridor LWS (all off-site)				
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Medium	Low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk
Notes/ assumptions;					
[1] Site is assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 5: During construction CSM: current Keadby 1 Power Station (S1) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Ground gas (from landfill located within the S1 boundary, and any areas of significant Made Ground). Landfill known to contain inert and industrial waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids,	On-site users – Commercial users at Keadby 1 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely to low likelihood	Medium	Low to moderate/ low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (on-site)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Medium	Moderate/ low to moderate risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
alkalis, organic compounds, inorganic compounds, asbestos, TPH, PAH, solvents, lubricants, fuel oils, VOC, SVOC, timber and water treatment chemicals, PCB, methane, hydrogen sulphide and carbon dioxide.	Controlled waters – surface waters – North Soak Drain (on-site) Two surface water abstractions (not potable) (off-site, adjacent to the south)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – surface waters – Unnamed drains (on-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal, South Soak Drain (off-site)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Ecological receptors – Keadby Wetland LWS, South Soak Drain, Keadby LWS, Stainforth	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	and Keadby Canal Corridor LWS (all off-site)				
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely to low likelihood	Medium	Low to moderate/ low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk

Notes/ assumptions;

[1] Site investigation will be required prior to construction of the Proposed Development.

[2] S1 partly lies within the footprint of the Proposed Development and therefore may require remediation in the areas located within the Proposed Development Site boundary.

[3] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[4] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.

[5] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010.

[6] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
[7] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary. This might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources identified or it may alter ground gas pathways. This may result in a temporary worsening in groundwater quality or increased ground gas risk compared to baseline.					

Table 6: Post-construction CSM: current Keadby 1 Power Station (S1) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Ground gas (from landfill located within the S1 boundary, and any areas of significant Made Ground). Landfill known to contain inert and industrial waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids,	On-site users – Commercial users at Keadby 1 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild to medium	Very low to low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild to medium	Very low to low risk
		Inhalation of ground gases.	Unlikely	Mild to medium	Very low to low risk
	Off-site users – Future commercial users at Keadby 2 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
alkalis, organic compounds, inorganic compounds, asbestos, TPH, PAH, solvents, lubricants, fuel oils, VOC, SVOC, timber and water treatment chemicals, PCB, methane, hydrogen sulphide and carbon dioxide.		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Minor	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (on-site)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely to low likelihood	Medium	Low to moderate/ low risk
	Controlled waters – surface waters – North Soak Drain (on-site) Two surface water abstractions (not	Groundwater migration, direct run-off from site.	Unlikely to low likelihood	Medium	Low to moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	potable) (off-site, adjacent to the south)				
	Controlled waters – surface waters – Unnamed drains (on-site)	Groundwater migration, direct run-off from site.	Unlikely to low likelihood	Mild	Very low to low risk
	Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal, South Soak Drain (off-site)	Groundwater migration, direct run-off from site.	Unlikely	Mild to medium	Very low to low risk
	Ecological receptors – Keadby Wetland LWS, South Soak Drain, Keadby LWS, Stainforth and Keadby Canal	Vertical and lateral migration, direct contact.	Unlikely to low likelihood	Mild	Very low to low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Corridor LWS (all off-site)				
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Mild to medium	Very low to low risk
		Aggressive ground conditions.	Unlikely to low likelihood	Mild	Very low to low risk
	Future property receptors – Buildings, foundations and services (on-site and off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] Assumes construction works are complete and remediation has been carried out where necessary on areas within the Proposed Development boundary.

[3] A range may be given as remediation strategies will vary in design. Remediation strategies may involve source removal or pathway intervention as appropriate.

[4] Assumes that for the areas of S1 located outside of the Proposed Development Site boundary, the risks to the identified receptors will be as it was at baseline, as no direct intervention to remediate these areas will have taken place.

Table 7: Current Keadby 1 Power Station (S1) located within the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
On-site users – Commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
On-site users – Commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
On-site users – Commercial users Inhalation of ground gases.	Low risk	Low to moderate/ low risk	Very low to low risk	Neutral to minor adverse	Neutral to minor beneficial
Off-site users – Future commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	N/A	N/A	Very low risk	N/A	N/A
Off-site users – Future commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	N/A	N/A	Very low risk	N/A	N/A
Off-site users – Future commercial users Inhalation of ground gases.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Controlled waters – groundwater Secondary A and B aquifers and abstraction (on-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Moderate/ low risk	Moderate/ low to moderate risk	Low to moderate/ low risk	Neutral to minor adverse	Neutral to minor beneficial
Controlled waters – surface waters – North Soak Drain (on-site), abstractions (off-site, adjacent) Groundwater migration, direct run-off from site.	Moderate/ low risk	Moderate/ low risk	Low to moderate/ low risk	Neutral	Neutral to minor beneficial
Controlled waters – surface waters – unnamed drains (on-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal, South Soak Drain (off-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Ecological receptors – LWS Vertical and lateral migration, direct contact.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Property receptors – Buildings, foundations and services (on-site) Exposure to explosive gases.	Low risk	Low to moderate/ low risk	Very low to low risk	Neutral to minor adverse	Neutral to minor beneficial
Property receptors – Buildings, foundations and services (on-site) Aggressive ground conditions.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Future property receptors – Buildings, foundations and services (on-site and off-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Future property receptors – Buildings, foundations and services (on-site and off-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral to minor adverse**	**Neutral to minor beneficial**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. [2] The post-construction significance column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.					

Table 8: Risk and impact assessment for the historical landfill (S2) located within the Proposed Development Site boundary

Site ID (IDS)	S2
Site group	Baseline risk score 5 landfill site – historic landfill located within the Proposed Development Site boundary.
Site title (Site ID) and land use class	Historic Landfill and BGS Recorded Landfill Site - Keadby Power Station. Deposited waste included inert and industrial waste – (S2) Class 3.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Historic Landfill and BGS Recorded Landfill Site - Keadby Power Station – (S2)	Current public open space users at Keadby Common (on-site and off-site) Current commercial site users at the electricity	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not	Keadby Boundary Drain and various unnamed drains (on-site) Surface water abstraction (not potable) (off-site, adjacent to the north)	Keadby Boundary Drain Local Wildlife Site (LWS) (on-site)	Electricity Distribution Centre buildings (on-site) Future Keadby 3 Power Station buildings (on-site)

	distribution centre (on-site) Future commercial users at Keadby 3 Power Station (on-site)	potable) (off-site 200m south-east)			

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S2 is located partly within and partly outside of the Proposed Development Site boundary. As a significant proportion of S2 crosses the northern area of the main development of the Proposed PCC Site, it has been as assessed as being 'within' the Proposed Development Site boundary.

Table 9: Baseline CSM: historical landfill (S2) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Ground gas. Landfill known to contain inert and industrial waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds, inorganic compounds, asbestos, hydrocarbons (TPH), polyaromatic hydrocarbons (PAH),	On-site users – Commercial users at the electricity distribution centre	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low likelihood	Medium	Moderate/ low risk
		Inhalation of ground gases.	Low likelihood	Medium	Moderate/ low risk
	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
solvents, lubricants, fuel oils, alkalis, volatile organic compounds (VOC), semi-volatile organic compounds (SVOC), polychlorinated biphenyls (PCB), dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		Inhalation of ground gases.	Unlikely	Medium	Low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater –	Leaching, vertical and lateral migration	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Groundwater abstraction (not potable) (off-site, 200m distance)	from contaminated soils and waters.			
	Controlled waters – surface waters – Keadby Boundary Drain and various unnamed drains (on-site) Surface water abstraction (not potable) (off-site, adjacent)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Keadby Boundary Drain LWS (on-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Low likelihood	Medium	Moderate/ low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Notes/ assumptions;					
[1] Site is assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 10: During construction CSM: historical landfill (S2) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Ground gas. Landfill known to contain inert and industrial waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds, inorganic compounds, asbestos, TPH, PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC,	On-site users – Commercial users at the electricity distribution centre	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low likelihood	Medium	Moderate/ low risk
		Inhalation of ground gases.	Low likelihood to likely	Medium	Moderate/ low to moderate risk
	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		Inhalation of ground gases.	Unlikely	Medium	Low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Medium	Moderate/ low to moderate risk
	Controlled waters – groundwater –	Leaching, vertical and lateral migration	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Groundwater abstraction (not potable) (off-site, 200m distance)	from contaminated soils and waters.			
	Controlled waters – surface waters – Keadby Boundary Drain and various unnamed drains (on-site) Surface water abstraction (not potable) (off-site, adjacent)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Keadby Boundary Drain LWS (on-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors –	Exposure to explosive gases.	Unlikely to low likelihood	Severe	Moderate/ low to moderate risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Buildings, foundations and services (on-site)				

Notes/ assumptions;

- [1] Site investigation will be required prior to construction of the Proposed Development.
- [2] S2 partly lies within the footprint of the Proposed Development and therefore may require remediation within the areas of S2 that are within the Proposed Development Site boundary.

[3] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [4] During construction, standard mitigation procedures are assumed to be implemented in accordance with a Construction Environmental Management Plan (CEMP).
- [5] Construction workers have been excluded from the assessment due to the use of Personal Protective Equipment (PPE)/ risk management protocols and in accordance with CIRIA C692, 2010.
- [6] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.

[7] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary. This might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources identified or it may alter ground gas pathways. This may result in a temporary worsening in groundwater quality or increased ground gas risk compared to baseline.

Table 11: Post-construction CSM: historical landfill (S2) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Ground gas. Landfill known to contain inert and industrial waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds, inorganic compounds, asbestos, TPH,	On-site users – Commercial users at the electricity distribution centre	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Mild to medium	Low to moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low likelihood	Mild to medium	Low to moderate/ low risk
		Inhalation of ground gases.	Low likelihood	Mild to medium	Low to moderate/ low risk
	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC, PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		Inhalation of ground gases.	Unlikely	Medium	Low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild to medium	Very low to low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Minor to mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor to mild	Very low risk
	On-site users – Future commercial users at Keadby 3 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely to low likelihood	Medium	Low to moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 200m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild to medium	Very low to low risk
	Controlled waters – surface waters – Keadby Boundary Drain and various unnamed drains (on-site) Surface water abstraction (not	Groundwater migration, direct run-off from site.	Unlikely to low likelihood	Medium	Low to moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	potable) (off-site, adjacent)				
	Ecological receptors – Keadby Boundary Drain LWS (on-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Medium to severe	Low to moderate/ low risk
		Aggressive ground conditions.	Unlikely to low likelihood	Mild	Very low to low risk
	Future property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
[2] Assumes construction works are complete and remediation has been carried out where necessary on areas within the Proposed Development boundary. [3] A range may be given as remediation strategies will vary in design. Remediation strategies may involve source removal or pathway intervention as appropriate. [4] Assumes that for the areas of S2 located outside of the Proposed Development Site boundary, that upon completion of construction the risks to the identified receptors will be as it was at baseline, as no direct intervention to remediate these areas will have taken place. [5] The on-site public open space users at Keadby Common and the ecological receptor (Keadby Boundary Drain LWS) are located entirely within the area of S2 outside of the Proposed Development Site boundary. Therefore, no beneficial effects are considered likely.					

Table 12: Historical landfill (S2) located within the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
On-site users – Commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Moderate/ low risk	Moderate/ low risk	Low to moderate/ low risk	Neutral	Neutral to minor beneficial
On-site users – Commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Moderate/ low risk	Moderate/ low risk	Low to moderate/ low risk	Neutral	Neutral to minor beneficial
On-site users – Commercial users Inhalation of ground gases.	Moderate/ low risk	Moderate/ low to moderate risk	Low to moderate/ low risk	Neutral to minor adverse	Neutral to minor beneficial
On-site users – Public open space users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
On-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low risk	Low risk	Low risk	Neutral	Neutral
On-site users – Public open space users Inhalation of ground gases.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Public open space users	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.					
Off-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
On-site users – Future commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	N/A	N/A	Very low risk	N/A	N/A
On-site users – Future commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	N/A	N/A	Very low risk	N/A	N/A
On-site users – Future commercial users Inhalation of ground gases.	N/A	N/A	Very low risk	N/A	N/A
Controlled waters – groundwater Secondary A and B aquifers Leaching, vertical and lateral migration from contaminated soils and waters.	Moderate/ low risk	Moderate/ low to moderate risk	Low to moderate/ low risk	Neutral to minor adverse	Neutral to minor beneficial
Controlled waters – groundwater abstraction (off-site)	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Leaching, vertical and lateral migration from contaminated soils and waters.					
Controlled waters – surface waters – Keadby Boundary Drain and various unnamed drains (on-site), abstraction (off-site) Groundwater migration, direct run-off from site.	Moderate/ low risk	Moderate/ low risk	Low to moderate/ low risk	Neutral	Neutral to minor beneficial
Ecological receptors – LWS Vertical and lateral migration, direct contact.	Low risk	Low risk	Low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (on-site) Exposure to explosive gases.	Moderate/ low risk	Moderate/ low to moderate risk	Low to moderate/ low risk	Neutral to minor adverse	Neutral to minor beneficial
Property receptors – Buildings, foundations and services (on-site) Aggressive ground conditions.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Future property receptors – Buildings, foundations and services (on-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Future property receptors – Buildings, foundations and services (on-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Overall significance				**Neutral to minor adverse**	**Neutral to minor beneficial**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. [2] The post-construction significance column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete. [3] Note that a large proportion of S2 is located outside of the Proposed Development Site boundary which will not be remediated. Therefore, post-construction, no significant beneficial effects are considered likely.					

Table 13: Risk and impact assessment for the former tanks (S19) located within the Proposed Development Site boundary

Site ID (IDS)	S19
Site group	Baseline risk score 5 industrial site – former tanks located within the Proposed Development Site boundary
Site title (Site ID) and land use class	Former tanks – (S19) Class 3.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Former tanks – (S19)	Current residential users (off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer	River Trent (Humber Upper) (off-site) Two surface water abstractions (not potable) (off-site, 50m east)	Ramsar, Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI): Humber	Pumping station building (off-site) Residential buildings (off-site) Future Keadby 3 Power Station foundations and services (on-site)

		Groundwater abstraction (not potable) (off-site 850m west)		Estuary (off-site)	

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S19 is located entirely within the Proposed Development Site boundary.

Table 14: Baseline CSM: former tanks (S19) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including lead, fuels/ TPH, PAH.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 850m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Controlled waters – surface waters – River Trent (Humber Upper) (off-site) Two surface water abstractions (not potable) (off-site, 50m distance)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Medium	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk
Notes/ assumptions;					
[1] Site is assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 15: During Construction CSM: former tanks (S19) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including lead, fuels/ TPH, PAH.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Medium	Moderate/ low to low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 850m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Controlled waters – surface waters – River Trent (Humber Upper) (off-site) Two surface water abstractions (not potable) (off-site, 50m distance)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Medium	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Notes/ assumptions;					

- [1] Site investigation will be required prior to construction of the Proposed Development.
- [2] S19 is located within the footprint of the Proposed Development and therefore may require remediation in this area.

[3] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [4] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.
- [5] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010.

[6] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.

[7] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources which may cause a temporary worsening in groundwater quality compared to baseline.

[8] The groundwater abstraction is considered too distant from S19 to be affected during construction.

[9] The potential for ground gas from S19 is not considered significant enough to result in an increased risk during construction.

Table 16: Post-construction CSM: former tanks (S19) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including lead, fuels/ TPH, PAH.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild to medium	Very low to low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild to medium	Very low to low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely to low likelihood	Medium	Low to moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 850m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Minor to medium	Very low to low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Controlled waters – surface waters – River Trent (Humber Upper) (off-site) Two surface water abstractions (not potable) (off-site, 50m distance)	Groundwater migration, direct run-off from site.	Unlikely	Mild to medium	Very low to low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Mild to medium	Very low to low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor to mild	Very low risk
	Future property receptors – Foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. • [2] Assumes construction works are complete and remediation has been carried out where necessary on areas within the Proposed Development boundary. [3] A range may be given as remediation strategies will vary in design. Remediation strategies may involve source removal or pathway intervention as appropriate.					

Table 17: Former tanks (S19) located within the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Residential users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Off-site users – Residential users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Off-site users – Residential users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Controlled waters – groundwater Secondary A and B aquifers Leaching, vertical and lateral migration from contaminated soils and waters.	Moderate/ low risk	Moderate/ low to low risk	Low to moderate/ low risk	Neutral to minor adverse	Neutral to minor beneficial
Controlled waters – groundwater abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Controlled waters – surface waters – River Trent (Humber Upper) (off-site), abstractions (off-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Ecological receptors – Ramsar, SAC and SSSI Vertical and lateral migration, direct contact.	Low risk	Low risk	Very low to low risk	Neutral	Neutral to minor beneficial
Property receptors – Buildings, foundations and services (off-site) Exposure to explosive gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Aggressive ground conditions.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Future property receptors – Foundations and services (on-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Future property receptors – Foundations and services (on-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral to minor adverse**	**Neutral to minor beneficial**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. [2] The post-construction significance column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.					

Table 18: Risk and impact assessment for the former railway (S11) located within the Proposed Development Site boundary

Site ID (IDS)	S11
Site group	Railway site – former railway located within the Proposed Development Site boundary
Site title (Site ID) and land use class	Former railway sidings and conveyor system – (S11) Class 2.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Former railway sidings and conveyor system – (S11)	Current public open space users at Keadby Common (on-site and off-site) Future commercial users at Keadby 3	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer	Unnamed drain (off-site, adjacent) North Soak Drain (off-site) Surface water abstraction (not potable) (off-site, 250m south)	Stainforth and Keadby Canal Corridor LWS (off-site)	Future Keadby 3 Power Station buildings (on-site)

	Power Station (on-site)	Groundwater abstraction (not potable) (off-site 120m east)			

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S11 is located partly within and partly outside of the Proposed Development Site boundary. As a significant proportion of S11 crosses the southern area of the main development of the Proposed PCC Site, it has been assessed as being 'within' the Proposed Development Site boundary.

Table 19: Baseline CSM: former railway (S11) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Mild	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
ash and other waste.	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 120m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – surface waters – North Soak Drain (off-site) Surface water abstraction (not potable) (off-site, 250m distance)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Unnamed drain (off-site, adjacent)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Ecological receptors – Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Notes/ assumptions;					
[1] Site is assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 20: During Construction CSM: former railway (S11) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Mild	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
ash and other waste.	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 120m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Medium	Moderate/ low to moderate risk
	Controlled waters – surface waters – North Soak Drain (off-site) Surface water abstraction (not potable) (off-site, 250m distance)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Unnamed drain (off-site, adjacent)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Ecological receptors – Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Notes/ assumptions;					

- [1] Site investigation will be required prior to construction of the Proposed Development.
- [2] S11 partly lies within the footprint of the Proposed Development and therefore may require remediation in the areas located within the Proposed Development Site boundary.

[3] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [4] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.
- [5] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010.
- [6] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline.

[7] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources which may cause a temporary worsening in groundwater quality compared to baseline.

[8] The potential for ground gas from S11 is not considered significant enough to result in an increased risk during construction.

Table 21: Post-construction CSM: former railway (S11) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Mild	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
ash and other waste.	On-site users – Future commercial users at Keadby 3 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Minor	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 120m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Mild to moderate	Low to moderate/ low risk
	Controlled waters – surface waters – North Soak Drain (off-site)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Surface water abstraction (not potable) (off-site, 250m distance)				
	Controlled waters – surface waters – Unnamed drain (off-site, adjacent)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Ecological receptors – Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Minor to mild	Very low risk
	Future property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] Assumes construction works are complete and remediation has been carried out where necessary on areas within the Proposed Development boundary.					

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
[3] A range may be given as remediation strategies will vary in design. Remediation strategies may involve source removal or pathway intervention as appropriate. [4] Assumes that for the areas of S11 located outside of the Proposed Development Site boundary, the risks to the identified receptors will be as it was at baseline, as no direct intervention to remediate these areas will have taken place. [5] The on-site and off-site public open space users at Keadby Common and unnamed drain are located entirely within/ nearby the area of S11 outside of the Proposed Development Site boundary. Therefore, no beneficial effects from remediation are considered likely.					

Table 22: Former railway (S11) located within the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
On-site users – Public open space users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Low risk	Neutral	Neutral
On-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
On-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Future commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Future commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	N/A	N/A	Very low risk	N/A	N/A
Off-site users – Future commercial users Inhalation of ground gases.	N/A	N/A	Very low risk	N/A	N/A
Controlled waters – groundwater Secondary A and B aquifers and abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Moderate/ low risk	Moderate/ low to moderate risk	Moderate/ low to low risk	Neutral to minor adverse	Neutral to minor beneficial
Controlled waters – surface waters – North Soak Drain (off-site) and abstraction (off-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Low risk	Neutral	Neutral
Controlled waters – surface waters – unnamed drains (off-site, adjacent) Groundwater migration, direct run-off from site.	Low risk	Low risk	Low risk	Neutral	Neutral
Ecological receptors – LWS Vertical and lateral migration, direct contact.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Future property receptors – Buildings, foundations and services (on-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Future property receptors – Buildings, foundations and services (on-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral to minor adverse**	**Neutral to minor beneficial**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. [2] The post-construction significance column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.					

Table 23: Risk and impact assessment for the current marina and wharf (S12) located within the Proposed Development Site boundary

Site ID (IDS)	S12
Site group	Industrial site – current marina and wharf including current warehouse, former railway and gasometer and infilled pond located within the Proposed Development Site boundary
Site title (Site ID) and land use class	Current PD Ports Marina and wharf including current warehouse, former railway and gasometer and infilled pond – (S12) Class 2.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Current PD Ports Marina and wharf including current warehouse and former railway and gasometer and infilled pond – (S12)	Current commercial users at PD Ports Marina (on-site) Current residential users (off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer	Unnamed drains (on-site) River Trent (Humber Upper) (off-site, adjacent) Sheffield and South Yorkshire Navigation/ Stainforth and Keadby	Ramsar, SAC and SSSI: Humber Estuary (off-site) LWS (both off-site);	PD Ports Marina buildings (on-site) Residential buildings (off-site)

	Current commercial users (public house) (off-site)	Groundwater abstraction (not potable) (off-site 530m west)	Canal (off-site, adjacent) Two surface water abstractions (not potable) (off-site, 90m north-east)	Keadby Wetland Stainforth and Keadby Canal Corridor	Commercial building (off-site) Future Keadby 3 Power Station foundations and services (on-site)
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] S12 is located partly within and partly outside of the Proposed Development Site boundary. Approximately a third of S12 is located within the Proposed Development Site boundary which has been proposed for a haulage route and transport offloading. As this area does not currently have any access road, it has been assumed that cut operations are likely in this area. Therefore, S12 has been conservatively assessed as being 'within' the Proposed Development Site boundary.					

Table 24: Baseline CSM: current marina and wharf (S12) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in ash and other waste.	On-site users – Commercial users at PD Ports Marina	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Low likelihood	Mild	Low risk
	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users –	Direct contact, ingestion, inhalation of	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Marinas can be impacted by metals and metalloids, inorganic chemicals, asbestos, phenol, PAH, TPH and PCB. Potential for some elevated carbon dioxide and methane from fill materials of former railway land and infilled pond.	Current commercial users (public house)	dust/ vapour with/ from contaminated soils.			
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Mild	Low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 530m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild	Very low risk
	Controlled waters – surface waters – River Trent (Humber Upper) (off-site, adjacent)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site, adjacent) Two surface water abstractions (not potable) (off-site, 90m north-east)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Unnamed drains (on-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Keadby Wetland LWS and Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk
Notes/ assumptions;					
[1] Site is assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 25: During construction CSM: current marina and wharf (S12) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in	On-site users – Commercial users at PD Ports Marina	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Low likelihood	Mild	Low risk
	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
ash and other waste. Marinas can be impacted by metals and metalloids, inorganic chemicals, asbestos, phenol, PAH, TPH and PCB. Potential for some elevated carbon dioxide and methane from fill materials of former railway land and infilled pond.	Off-site users – Current commercial users (public house)	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Mild	Low to moderate/ risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 530m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild	Very low risk
	Controlled waters – surface waters –	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	River Trent (Humber Upper) (off-site, adjacent)				
	Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site, adjacent) Two surface water abstractions (not potable) (off-site, 90m north-east)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Unnamed drains (on-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Ecological receptors – Keadby Wetland LWS and Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk

Notes/ assumptions;

- [1] Site investigation will be required prior to construction of the Proposed Development.
- [2] S12 partly lies within the footprint of the Proposed Development and therefore may require remediation in the areas located within the Proposed Development Site boundary.

[3] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [4] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
• [5] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010. • [6] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline. [7] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources which may cause a temporary worsening in groundwater quality compared to baseline. [8] The groundwater abstraction is considered too distant from S12 to be affected during construction. [9] The potential for ground gas from S12 is not considered significant enough to result in an increased risk during construction.					

Table 26: Post-construction CSM: current marina and wharf (S12) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in	On-site users – Commercial users at PD Ports Marina	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Low likelihood	Mild	Low risk
	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
ash and other waste. Marinas can be impacted by metals and metalloids, inorganic chemicals, asbestos, phenol, PAH, TPH and PCB. Potential for some elevated carbon dioxide and methane from fill materials of former railway land and infilled pond.	Off-site users – Current commercial users (public house)	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Mild	Low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 530m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild	Very low risk
	Controlled waters – surface waters –	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	River Trent (Humber Upper) (off-site, adjacent)				
	Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site, adjacent) Two surface water abstractions (not potable) (off-site, 90m north-east)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Unnamed drains (on-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Ecological receptors – Keadby Wetland LWS and Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk
	Future property receptors – Foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
[2] Assumes construction works are complete and remediation has been carried out where necessary on areas within the Proposed Development boundary. [3] A range may be given as remediation strategies will vary in design. Remediation strategies may involve source removal or pathway intervention as appropriate. [4] Assumes that for the areas of S12 located outside of the Proposed Development Site boundary, the risks to the identified receptors will be as it was at baseline, as no direct intervention to remediate these areas will have taken place. [5] The on-site current commercial users and buildings at PD Ports Marina are located entirely within/ nearby the area of S12 outside of the Proposed Development Site boundary. Therefore, no beneficial effects from remediation are considered likely.					

Table 27: Current marina and wharf (S12) located within the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
On-site users – Commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Low risk	Neutral	Neutral
On-site users – Commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low risk	Low risk	Low risk	Neutral	Neutral
On-site users – Commercial users Inhalation of ground gases.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Residential users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Residential users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Residential users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Very low risk	Very low risk	Very low risk	Neutral	Neutral

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Commercial users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Controlled waters – groundwater Secondary A and B aquifers Leaching, vertical and lateral migration from contaminated soils and waters.	Low risk	Low to moderate/ risk	Low risk	Neutral to minor adverse	Neutral
Controlled waters – groundwater abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Controlled waters – surface waters – River Trent (Humber Upper) (off-site) Groundwater migration, direct run-off from site.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
Controlled waters – surface waters – Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site), abstractions (off-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Low risk	Neutral	Neutral
Controlled waters – surface waters – unnamed drains (on-site)	Low risk	Low risk	Low risk	Neutral	Neutral

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Groundwater migration, direct run-off from site.					
Ecological receptors – Ramsar, SAC and SSSI Vertical and lateral migration, direct contact.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
Ecological receptors – LWS Vertical and lateral migration, direct contact.	Low risk	Low risk	Low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (on-site) Exposure to explosive gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (on-site) Aggressive ground conditions.	Low risk	Low risk	Low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Exposure to explosive gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Aggressive ground conditions.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Future property receptors – Foundations and services (on-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Future property receptors – Foundations and services (on-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral to minor adverse**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. [2] The post-construction significance column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.					

Table 28: Risk and impact assessment for the current pumping station (S14) located within the Proposed Development Site boundary

Site ID (IDS)	S14
Site group	Light industrial site – current pumping station located within the Proposed Development Site boundary
Site title (Site ID) and land use class	Current pumping station – (S14) Class 1.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Current pumping station – (S14)	Current residential users (off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer	River Trent (Humber Upper) (off-site) Two surface water abstractions (not potable) (off-site, 20m east) Two surface water abstractions (not	Ramsar, SAC and SSSI: Humber Estuary (off-site)	Pumping station building (on-site) Residential buildings (off-site) Future Keadby 3 Power

		Groundwater abstraction (not potable) (off-site 870m west)	potable) (off-site, 220m north-east)		Station foundations and services (on-site)

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S14 is located entirely within the Proposed Development Site boundary.

Table 29: Baseline CSM: current pumping station (S14) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including metals, ammonia, acids, asbestos, TPH, solvents, fuel oils and alkalis.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 870m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Minor	Very low risk
	Controlled waters – surface waters –	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	River Trent (Humber Upper) (off-site) Surface water abstractions (not potable) (off-site, 20m to 220m distance)				
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Medium	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk
Notes/ assumptions;					
[1] Site is assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 30: During construction CSM: current pumping station (S14) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including metals, ammonia, acids, asbestos, TPH, solvents, fuel oils and alkalis.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely to low likelihood	Mild	Very low to low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 870m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Controlled waters – surface waters – River Trent (Humber Upper) (off-site) Surface water abstractions (not potable) (off-site, 20m to 220m distance)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Medium	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk
Notes/ assumptions;					
• [1] Site investigation will be required prior to construction of the Proposed Development. • [2] S14 is located within the footprint of the Proposed Development and therefore may require remediation in this area. [3] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
• [4] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP. • [5] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010. • [6] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline. [7] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources which may cause a temporary worsening in groundwater quality compared to baseline. [8] The groundwater abstraction is considered too distant from S14 to be affected during construction. [9] The potential for ground gas from S14 is not considered significant enough to result in an increased risk during construction.					

Table 31: Post-construction CSM: current pumping station (S14) located within the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including metals, ammonia, acids, asbestos, TPH, solvents, fuel oils and alkalis.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Minor to mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Minor to mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Minor to mild	Very low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 870m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Controlled waters – surface waters – River Trent (Humber Upper) (off-site) Surface water abstractions (not potable) (off-site, 20m to 220m distance)	Groundwater migration, direct run-off from site.	Unlikely	Medium	Low risk
	Ecological receptors – Ramsar, SAC and SSSI: Humber Estuary (off-site)	Vertical and lateral migration, direct contact.	Unlikely	Medium	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor to mild	Very low risk
		Aggressive ground conditions.	Unlikely	Minor to mild	Very low risk
	Future property receptors – Foundations and services (on-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. • [2] Assumes construction works are complete and remediation has been carried out where necessary on areas within the Proposed Development boundary. [3] A range may be given as remediation strategies will vary in design. Remediation strategies may involve source removal or pathway intervention as appropriate.					

Table 32: Current pumping station (S14) located within the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Residential users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Residential users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Residential users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Controlled waters – groundwater Secondary A and B aquifers Leaching, vertical and lateral migration from contaminated soils and waters.	Very low risk	Very low to low risk	Very low risk	Neutral to minor adverse	Neutral
Controlled waters – groundwater abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Controlled waters – surface waters – River Trent (Humber Upper) (off-site), abstractions (off-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Low risk	Neutral	Neutral

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Ecological receptors – Ramsar, SAC and SSSI Vertical and lateral migration, direct contact.	Low risk	Low risk	Low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Exposure to explosive gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Aggressive ground conditions.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Future property receptors – Foundations and services (on-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Future property receptors – Foundations and services (on-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral to minor adverse**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction. [2] The post-construction significance column assumes remediation required has been undertaken and the benefits of remediation realised. Assumes construction works are complete.					

Table 33: Risk and impact assessment for the historic landfills (S4, S5, S6) located outside of the Proposed Development Site boundary

Site ID (IDS)	S4, S5, S6
Site group	Baseline risk score 5 landfill sites – historic landfills located outside of the Proposed Development Site boundary
Site title (Site ID) and land use class	Historic Landfill and Licensed Waste Management Facility - Keadby Power Station. Deposited waste included inert, commercial and household waste – (S4) Class 3. Historic Landfill - Keadby Central Electricity Generating Board. Deposited waste included inert, industrial, commercial and household waste, ash (from Keadby Power Station after lagoon settlement), construction, colliery tailings, refractories (from Keadby Power Station), asbestos – (S5) Class 3. Historic Landfill - Former Keadby Power Station and Registered Landfill - Transtore Industries. Deposited waste included inert, industrial, commercial, household and special waste – (S6) Class 3.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Historic Landfill and Licensed Waste	Current public open space users	Superficial geology (Alluvium/ Warp) – Secondary A aquifer	North Soak Drain (off-site)	Stainforth and Keadby Canal	Future Keadby 3 Power

Management Facility - Keadby Power Station – (S4)	at Keadby Common (on-site and off-site)	Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 780m east)	Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site) Surface water abstraction (not potable) (off-site, 170m south)	Corridor LWS (off-site)	Station foundations and services (on-site)

Site title (Site ID)	Human receptor (on-site, adjacent and/ or <50m)	Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)	Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)	Ecological designation (on-site, adjacent and/ or <50m)	Property e.g. buildings and structures (on-site, adjacent and/ or <50m)
Historic Landfill - Keadby Central Electricity Generating Board – (S5)	Current public open space users at Keadby Common (on-site and off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 840m east)	North Soak Drain (off-site) Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site) Surface water abstraction (not potable) (off-site, 190m south-east)	Stainforth and Keadby Canal Corridor LWS (off-site)	Future Keadby 3 Power Station foundations and services (on-site)

Historic Landfill - Former Keadby Power Station and Registered Landfill - Transtore Industries – (S6)	Current public open space users at Keadby Common (on-site and off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer	Unnamed drain (off-site) North Soak Drain (off-site) Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site)	None	Future Keadby 3 Power Station foundations and services (on-site)

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S4, S5 and S6 extend slightly to within the Proposed Development Site boundary within an area proposed for vehicular site access with a track already present. Therefore, it has been assumed that cut operations are likely to be limited in this area. These sites have been assessed as being 'outside' of the Proposed Development Site boundary.

Table 34: Baseline CSM: historic landfills (S4, S5, S6) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Ground gas. Landfills known to contain inert, industrial, commercial, household, special, ash and asbestos waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds, inorganic compounds, asbestos, TPH,	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC, PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		vapour with/ from contaminated waters.			
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 780m – 840m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Unnamed drain (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site) Surface water abstraction (not potable) (off-site, 170m – 190m distance)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
Notes/ assumptions;					
[1] Sites are assessed against baseline condition without construction of the Proposed Development.					

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 35: During construction CSM: historic landfills (S4, S5, S6) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Ground gas. Landfills known to contain inert, industrial, commercial, household, special, ash and asbestos waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds,	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
inorganic compounds, asbestos, TPH, PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC, PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Medium	Moderate/ low to moderate risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 780m – 840m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Controlled waters – surface waters – Unnamed drain (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site) Surface water abstraction (not potable) (off-site, 170m – 190m distance)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Notes/ assumptions;					
• [1] As these sites are located mostly outside of the Proposed Development Site boundary, it is assumed that no ground investigations or remediation will be undertaken on these sites. However, these sites may have the potential to influence conditions on the Proposed Development Site during construction. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. • [3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP. • [4] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010. [5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline [6] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources (including those beyond the Proposed Development Site boundary) or alter ground gas pathways which may cause a temporary worsening in groundwater quality or increased ground gas risk compared to baseline. [7] The groundwater abstraction is considered too distant from S4 and S5 to be affected during construction.					

Table 36: Post-construction CSM: historic landfills (S4, S5, S6) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Ground gas. Landfills known to contain inert, industrial, commercial, household, special, ash and asbestos waste. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds,	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
inorganic compounds, asbestos, TPH, PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC, PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		vapour with/ from contaminated waters.			
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 780m – 840m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Unnamed drain (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site) Surface water abstraction (not potable) (off-site, 170m – 190m distance)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Stainforth and Keadby Canal Corridor LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Future property receptors –	Exposure to explosive gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Foundations and services (on-site)	Aggressive ground conditions.	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] Assumes for sites outside of the Proposed Development Site boundary that upon completion of construction, the risk from this group of sites to the identified receptors will be as it was at baseline, as no direct intervention to remediate these sites will have taken place.					

Table 37: Historic landfills (S4, S5, S6) located outside of the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
On-site users – Public open space users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
On-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
On-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Controlled waters – groundwater Secondary A and B aquifers	Moderate/ low risk	Moderate/ low to moderate risk	Moderate/ low risk	Neutral to minor adverse	Neutral

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Leaching, vertical and lateral migration from contaminated soils and waters.					
Controlled waters – groundwater abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Low risk	Low risk	Low risk	Neutral	Neutral
Controlled waters – surface waters – unnamed drain (off-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Low risk	Neutral	Neutral
Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site), abstraction (off-site) Groundwater migration, direct run-off from site.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
Ecological receptors – LWS Vertical and lateral migration, direct contact.	Low risk	Low risk	Low risk	Neutral	Neutral
Future property receptors – Foundations and services (on-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Future property receptors – Foundations and services (on-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Overall significance				**Neutral to minor adverse**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate inputs from construction.					

Table 38: Risk and impact assessment for the historic landfills (S3, S7 and S8) located outside of the Proposed Development Site boundary

Site ID (IDS)	S3, S7, S8
Site group	Landfill sites – historic landfills located outside of the Proposed Development Site boundary
Site title (Site ID) and land use class	Historic Landfill and Licensed Waste Management Facility - John Brown Engineering Landfill. Deposited waste included inert and industrial waste, and liquid sludge – (S3) Class 3. Historic Landfill Site - PFA Settlement Lagoon – (S7) Class 3. Historic Landfill Site - Keadby Power Station – (S8) Class 3.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Historic Landfill and Licensed Waste Management Facility - John Brown Engineering Landfill – (S3)	Current public open space users at Keadby Common (on-site and off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 780m east)	Unnamed drain (off-site) North Soak Drain (off-site) Surface water abstraction (not	None	Future Keadby 3 Power Station foundations and services (off-site)

			potable) (off-site, 210m south)		

Site title (Site ID)	Human receptor (on-site, adjacent and/ or <50m)	Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)	Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)	Ecological designation (on-site, adjacent and/ or <50m)	Property e.g. buildings and structures (on-site, adjacent and/ or <50m)
Historic Landfill Site - PFA Settlement Lagoon – (S7)	Current public open space users at Keadby Common (on-site) Future commercial users at Keadby 3 Power Station (off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 680m east)	Various unnamed drains (off-site) No surface water abstractions present within 250m of the site.	None	Future Keadby 3 Power Station buildings (off-site)
Historic Landfill Site - Keadby Power Station – (S8)	Current public open space users at Keadby Common (on-site and off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer	Unnamed drain (off-site) No surface water abstractions present within 250m of the site.	None	None

		Groundwater abstraction (not potable) (off-site 900m east)			

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S3, S7 and S8 are located entirely outside of the Proposed Development Site boundary.

Table 39: Baseline CSM: historic landfills (S3, S7 and S8) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Ground gas. Landfills known to contain inert and industrial waste and liquid sludge. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds, inorganic compounds, asbestos, TPH, PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC,	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of	Unlikely	Mild	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		vapour with/ from contaminated waters.			
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 680m – 900m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Various unnamed drains (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Controlled waters – surface waters – North Soak Drain (off-site) Surface water abstraction (not potable) (off-site, 210m distance)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
Notes/ assumptions;					
[1] Sites are assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 40: During construction CSM: historic landfills (S3, S7 and S8) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Ground gas. Landfills known to contain inert and industrial waste and liquid sludge. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds, inorganic compounds, asbestos, TPH,	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC, PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Medium	Moderate/ low to moderate risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 680m – 900m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Controlled waters – surface waters – Various unnamed drains (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Controlled waters – surface waters – North Soak Drain (off-site) Surface water abstraction (not potable) (off-site, 210m distance)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Notes/ assumptions;

- [1] As these sites are located outside of the Proposed Development Site boundary, it is assumed that no ground investigations or remediation will be undertaken on these sites. However, these sites may have the potential to influence conditions on the Proposed Development Site during construction.

[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.
- [4] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010.

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
• [5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline. [6] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources (including sources outside of the Proposed Development Site boundary) or alter ground gas pathways which may cause a temporary worsening in groundwater quality or increased ground gas risk compared to baseline. [7] The groundwater abstraction is considered too distant from S3, S7 and S8 to be affected during construction.					

Table 41: Post-construction CSM: historic landfills (S3, S7 and S8) located outside the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Ground gas. Landfills known to contain inert and industrial waste and liquid sludge. Potential for a range of inorganic and organic contaminants including but not limited to metals, metalloids, acids, organic compounds, inorganic compounds, asbestos, TPH,	On-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Medium	Moderate/ low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Public open space users at Keadby Common	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
PAH, solvents, lubricants, fuel oils, alkalis, VOC, SVOC, PCB, dioxins, furans, methane, hydrogen sulphide and carbon dioxide.		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Mild	Very low risk
	Off-site users – Future commercial users at Keadby 3 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Minor	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 680m – 900m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk
	Controlled waters – surface waters – Various unnamed drains (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Mild	Low risk
	Controlled waters – surface waters – North Soak Drain (off-site) Surface water abstraction (not	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	potable) (off-site, 210m distance)				
	Future property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] Assumes for sites outside of the Proposed Development Site boundary that upon completion of construction, the risk from this group of sites to the identified receptors will be as it was at baseline, as no direct intervention to remediate these sites will have taken place.					

Table 42: Historic landfills (S3, S7 and S8) located outside of the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
On-site users – Public open space users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
On-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
On-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Public open space users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Future commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Future commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	N/A	N/A	Very low risk	N/A	N/A
Off-site users – Future commercial users Inhalation of ground gases.	N/A	N/A	Very low risk	N/A	N/A
Controlled waters – groundwater Secondary A and B aquifers Leaching, vertical and lateral migration from contaminated soils and waters.	Moderate/ low risk	Moderate/ low to moderate risk	Moderate/ low risk	Neutral to minor adverse	Neutral
Controlled waters – groundwater abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Low risk	Low risk	Low risk	Neutral	Neutral
Controlled waters – surface waters – unnamed drains (off-site) Groundwater migration, direct run-off from site.	Low risk	Low risk	Low risk	Neutral	Neutral
Controlled waters – surface waters – North Soak Drain (off-site), abstraction (off-site) Groundwater migration, direct run-off from site.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
Future property receptors – Foundations and services (off-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Future property receptors – Foundations and services (off-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral to minor adverse**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction.					

Table 43: Risk and impact assessment for the current and former railways (S9 and S10) located outside of the Proposed Development Site boundary

Site ID (IDS)	S9, S10
Site group	Railway sites – current and former railways located outside of the Proposed Development Site boundary
Site title (Site ID) and land use class	Current railway – (S9) Class 2. Former railway – (S10) Class 2.

Site title (Site ID)	Human receptor (on-site, adjacent and/ or <50m)	Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)	Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)	Ecological designation (on-site, adjacent and/ or <50m)	Property e.g. buildings and structures (on-site, adjacent and/ or <50m)
Current railway – (S9)	Current commercial users at Keadby 1 Power Station (off-site) Current residential users (off-site) Future commercial users at Keadby 2 and Keadby 3 Power Station (off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 160m north)	North Soak Drain (off-site, adjacent) Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site, adjacent) South Soak Drain (off-site, adjacent) Two surface water abstractions (not potable) (off-site, 100m north-east) Surface water abstraction (not potable) (off-site, 130m south)	LWS (all off-site); Keadby Wetland South Soak Drain, Keadby Stainforth and Keadby Canal Corridor Keadby Wet Grassland	Residential buildings (off-site) Keadby 1 Power Station foundations and services (off-site) Future Keadby 2 and Keadby 3 Power Station buildings (off-site)

Site title (Site ID)	Human receptor (on-site, adjacent and/ or <50m)	Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)	Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)	Ecological designation (on-site, adjacent and/ or <50m)	Property e.g. buildings and structures (on-site, adjacent and/ or <50m)
Former railway – (S10)	Current commercial users at Keadby 1 Power Station (off-site) Current residential users (off-site) Future commercial users at Keadby 2 Power Station (off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 150m north)	North Soak Drain (off-site, adjacent) Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal (off-site, adjacent) South Soak Drain (off-site) Two surface water abstractions (not potable) (off-site, adjacent to the north)	LWS (all off-site); Keadby Wetland South Soak Drain, Keadby Stainforth and Keadby Canal Corridor	Keadby 1 Power Station buildings (off-site) Residential buildings (off-site) Future Keadby 2 Power Station buildings (off-site) Future Keadby 3 Power Station foundations and services (on-site)

Notes/ assumptions;
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] S10 extends to slightly within the Proposed Development Site boundary which is an area proposed for canal water supply connection works. It is assumed that cut operations are likely to be limited in this area. Therefore, this site has been assessed as being 'outside' of the Proposed Development Site boundary. [3] S9 is located entirely outside the Proposed Development Site boundary.

Table 44: Baseline CSM: current and former railways (S9 and S10) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in ash and other waste.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Off-site users – Commercial users at Keadby 1 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low likelihood	Mild	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 150m to 160m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Mild	Low risk
	Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal and South Soak Drain (off-site) Surface water abstractions (not potable) (off-site, adjacent to 130m distance)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Keadby Wetland LWS, South Soak Drain,	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Keadby LWS, Stainforth and Keadby Canal Corridor LWS and Keadby Wet Grassland LWS				
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk
Notes/ assumptions;					
[1] Sites are assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 45: During construction CSM: current and former railways (S9 and S10) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Off-site users – Commercial users at Keadby 1 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Mild	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
ash and other waste.	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 150m to 160m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood to likely	Mild	Low to moderate/ low risk
	Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal and South Soak Drain (off-site) Surface water abstractions (not potable) (off-site, adjacent to 130m distance)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Ecological receptors – Keadby Wetland LWS, South Soak Drain, Keadby LWS, Stainforth and Keadby Canal Corridor LWS and Keadby Wet Grassland LWS	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Mild	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk

Notes/ assumptions;

- [1] As these sites have been assessed as being outside of the Proposed Development Site boundary, it is assumed that no ground investigations or remediation will be undertaken on these sites. However, based on their proximity to the Proposed Development, S9 and S10 may have the potential to influence conditions on the Proposed Development Site during construction.

[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
• [4] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010. • [5] While a CEMP will make it unlikely that there will be adverse consequences resulting from construction there may still be temporary minor adverse effects from ground disturbance in these areas. The adoption of a CEMP generally results in a low to unlikely probability of a consequence, but in some cases the actual consequence may temporarily increase from that defined at baseline. [6] It is assumed that earthworks may require cut operations anywhere within the Proposed Development boundary which might temporarily worsen groundwater quality, for example, as a result of dewatering activities, which may potentially draw contaminated groundwater away from the sources (including those located outside of the Proposed Development Site boundary) which may cause a temporary worsening in groundwater quality compared to baseline. • [8] The potential for ground gas from S9 and S10 is not considered significant enough to result in an increased risk during construction.					

Table 46: Post-construction CSM: current and former railways (S9 and S10) located outside the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Railway land can be impacted by fuels, lubricants, metals and asbestos as well as the preservatives such as creosote used on railway sleepers and herbicides. Railway embankments may contain material high in	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Off-site users – Commercial users at Keadby 1 Power Station	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low Likelihood	Mild	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Mild	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
ash and other waste.	Off-site users – Future commercial users at Keadby 2 and Keadby 3 Power Stations	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Minor	Very low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Minor	Very low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 150m to 160m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Mild	Low risk
	Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Stainforth and Keadby Canal and South Soak Drain (off-site) Surface water abstractions (not potable) (off-site, adjacent to 130m distance)				
	Ecological receptors – Keadby Wetland LWS, South Soak Drain, Keadby LWS, Stainforth and Keadby Canal Corridor LWS and Keadby Wet Grassland LWS	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Mild	Very low risk
	Future property receptors –	Exposure to explosive gases.	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Buildings, foundations and services (off-site)	Aggressive ground conditions.	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] Assumes for sites outside of the Proposed Development Site boundary that upon completion of construction, the risk from this group of sites to the identified receptors will be as it was at baseline, as no direct intervention to remediate these sites will have taken place.					

Table 47: Current and former railway (S9 and S10) located outside the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Residential users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Residential users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Residential users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Commercial users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Off-site users – Future commercial users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	N/A	N/A	Very low risk	N/A	N/A

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Future commercial users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	N/A	N/A	Very low risk	N/A	N/A
Off-site users – Future commercial users Inhalation of ground gases.	N/A	N/A	Very low risk	N/A	N/A
Controlled waters – groundwater Secondary A and B aquifers and abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Low risk	Low to moderate/ low risk	Low risk	Neutral to minor adverse	Neutral
Controlled waters – surface waters – North Soak Drain, Sheffield and South Yorkshire Navigation/ Stainforth and Keadby Canal and South Soak Drain (off-site) and abstraction (off-site) Groundwater migration, direct run-off from site.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
Ecological receptors – LWS Vertical and lateral migration, direct contact.	Low risk	Low risk	Low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Exposure to explosive gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site)	Very low risk	Very low risk	Very low risk	Neutral	Neutral

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Aggressive ground conditions.					
Future property receptors – Buildings, foundations and services (off-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Future property receptors – Buildings, foundations and services (off-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral to minor adverse**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction.					

Table 48: Risk and impact assessment for the potential current tanks (S22) located outside of the Proposed Development Site boundary

Site ID (IDS)	S22
Site group	Industrial site – potential current tanks located outside of the Proposed Development Site boundary
Site title (Site ID) and land use class	Potential current tanks – (S22) Class 3.

Site title (Site ID)	**Human receptor (on-site, adjacent and/ or <50m)**	**Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)**	**Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)**	**Ecological designation (on-site, adjacent and/ or <50m)**	**Property e.g. buildings and structures (on-site, adjacent and/ or <50m)**
Potential current tanks – (S22)	Current residential users (off-site)	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 990m north-west)	Torne/ Three Rivers (includes South Engine Drain and Folly Drain) (off-site) No surface water abstractions present within 250m of the site.	Three Rivers LWS (off-site)	Residential buildings (off-site)
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] S22 is located entirely outside of the Proposed Development Site boundary.					

Table 49: Baseline CSM: potential current tanks (S22) located outside the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including lead, fuels/ TPH, PAH.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 990m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk
	Controlled waters – surface waters –	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Torne/ Three Rivers (includes South Engine Drain and Folly Drain) (off-site)				
	Ecological receptors – Three Rivers LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk
Notes/ assumptions;					
[1] Sites are assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 50: During construction CSM: potential current tanks (S22) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including lead, fuels/ TPH, PAH.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 990m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	Controlled waters – surface waters – Torne/ Three Rivers (includes South Engine Drain and Folly Drain) (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Three Rivers LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk

Notes/ assumptions;

- [1] As S22 is located outside of the Proposed Development Site boundary, it is assumed that no ground investigations or remediation will be undertaken.

[2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.
- [4] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010.

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
• [5] Due to the proximity of S22 from the proposed haulage route and transport offloading area (approximately 190m), it is unlikely that S22 would present an impact on the Proposed Development Site during construction.					

Table 51: Post-construction CSM: potential current tanks (S22) located outside the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including lead, fuels/ TPH, PAH.	Off-site users – Current residential users	Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Unlikely	Medium	Low risk
		Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Unlikely	Medium	Low risk
		Inhalation of ground gases.	Unlikely	Minor	Very low risk
	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B	Leaching, vertical and lateral migration from contaminated soils and waters.	Low likelihood	Medium	Moderate/ low risk
	Controlled waters – groundwater – Groundwater abstraction (not potable) (off-site, 990m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Medium	Low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Controlled waters – surface waters – Torne/ Three Rivers (includes South Engine Drain and Folly Drain) (off-site)	Groundwater migration, direct run-off from site.	Low likelihood	Medium	Moderate/ low risk
	Ecological receptors – Three Rivers LWS (off-site)	Vertical and lateral migration, direct contact.	Low likelihood	Mild	Low risk
	Property receptors – Buildings, foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Low likelihood	Mild	Low risk

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] Assumes for sites outside of the Proposed Development Site boundary that upon completion of construction, the risk from this group of sites to the identified receptors will be as it was at baseline, as no direct intervention to remediate these sites will have taken place.

Table 52: Potential current tanks (S22) located outside of the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Off-site users – Residential users Direct contact, ingestion, inhalation of dust/ vapour with/ from contaminated soils.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Residential users Direct contact, ingestion, inhalation of vapour with/ from contaminated waters.	Low risk	Low risk	Low risk	Neutral	Neutral
Off-site users – Residential users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Controlled waters – groundwater Secondary A and B aquifers Leaching, vertical and lateral migration from contaminated soils and waters.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral
Controlled waters – groundwater abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Low risk	Low risk	Low risk	Neutral	Neutral
Controlled waters – surface waters – Torne/ Three Rivers (includes South Engine Drain and Folly Drain) (off-site) Groundwater migration, direct run-off from site.	Moderate/ low risk	Moderate/ low risk	Moderate/ low risk	Neutral	Neutral

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Ecological receptors – LWS Vertical and lateral migration, direct contact.	Low risk	Low risk	Low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Exposure to explosive gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Property receptors – Buildings, foundations and services (off-site) Aggressive ground conditions.	Low risk	Low risk	Low risk	Neutral	Neutral
Overall significance				**Neutral**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction.					

Table 53: Risk and impact assessment for the current pumping station (S18) located outside of the Proposed Development Site boundary

Site ID (IDS)	S18
Site group	Light industrial site – current pumping station located outside of the Proposed Development Site boundary
Site title (Site ID) and land use class	Current pumping station – (S18) Class 1.

Site title (Site ID)	Human receptor (on-site, adjacent and/ or <50m)	Groundwater, including aquifer designation, and active groundwater abstractions (within 1km)	Surface water, including watercourses (on-site, adjacent and/ or <50m) and active surface water abstractions (within 250m)	Ecological designation (on-site, adjacent and/ or <50m)	Property e.g. buildings and structures (on-site, adjacent and/ or <50m)
Current pumping station – (S18)	None	Superficial geology (Alluvium/ Warp) – Secondary A aquifer Bedrock geology (Mercia Mudstone Formation) – Secondary B aquifer Groundwater abstraction (not potable) (off-site 550m south-west)	None	None	Future Keadby 3 Power Station foundations and services (off-site)

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] S18 is located entirely outside of the Proposed Development Site boundary.

Table 54: Baseline CSM: current pumping station (S18) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including metals, ammonia, acids, asbestos, TPH, solvents, fuel oils and alkalis.	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 550m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild	Very low risk
Notes/ assumptions;					
[1] Site is assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.					

Table 55: During construction CSM: current pumping station (S18) located outside the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including metals, ammonia, acids, asbestos, TPH, solvents, fuel oils and alkalis.	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 550m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild	Very low risk
Notes/ assumptions;					
• [1] As S18 is located outside of the Proposed Development Site boundary, it is assumed that no ground investigations or remediation will be undertaken. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. • [3] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP. • [4] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010.					

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
[5] Due to the very low potential for contamination from S18, it is unlikely that S18 would have the potential to influence groundwater conditions on the Proposed Development Site during construction, despite the proximity to the cooling water discharge pipeline (approximately 5m).					

Table 56: Post-construction CSM: current pumping station (S18) located outside of the Proposed Development Site boundary

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Soil, leachate and groundwater contamination. Low potential for ground gas. Potential for inorganic and organic contaminants including metals, ammonia, acids, asbestos, TPH, solvents, fuel oils and alkalis.	Controlled waters – groundwater – Superficial Secondary A Bedrock Secondary B Groundwater abstraction (not potable) (off-site, 550m distance)	Leaching, vertical and lateral migration from contaminated soils and waters.	Unlikely	Mild	Very low risk
	Future property receptors – Foundations and services (off-site)	Exposure to explosive gases.	Unlikely	Minor	Very low risk
		Aggressive ground conditions.	Unlikely	Minor	Very low risk

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

[2] Assumes for sites outside of the Proposed Development Site boundary that upon completion of construction, the risk from this group of sites to the identified receptors will be as it was at baseline, as no direct intervention to remediate these sites will have taken place.

Table 57: Current pumping station (S18) located outside of the Proposed Development Site boundary – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Controlled waters – groundwater Secondary A and B aquifers and abstraction (off-site) Leaching, vertical and lateral migration from contaminated soils and waters.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Future property receptors – Foundations and services (off-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Future property receptors – Foundations and services (off-site) Aggressive ground conditions.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction.					

Table 58: Risk and impact assessment for peat deposits located within and outside of the Proposed Development Site

Site title and land use class	Peat deposits – Class 1.

Site title	**Human receptor (adjacent and/ or <50m)**	**Property e.g. buildings and structures (adjacent and/ or <50m)**
Peat deposits	Current commercial users at Keadby 1 Power Station Current residential users (eastern-most extent of the Proposed Development Site) Other current commercial users (eastern-most extent of the Proposed Development Site) Public open space users at Keadby Common Future commercial users at Keadby 2 and Keadby 3 Power Stations	Keadby 1 Power Station buildings and services Residential buildings Other commercial buildings Future Keadby 2 and Keadby 3 Power Station buildings and services
Notes/ assumptions;		
[1] Peat deposits may be found anywhere within the Proposed Development Site boundary or study area. Peat has previously been encountered in isolated areas, up to 1.6m thickness in the superficial deposits. [2] Ground gas is the only potential contamination source from marshlands/ peat deposits. Therefore, the other pathways are excluded from the assessment.		

Table 59: Baseline CSM: peat deposits located within and outside of the Proposed Development Site

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
Potential low levels of ground gas – methane and carbon dioxide.	On-site and off-site users – Current commercial users at Keadby 1 Power Station Other current commercial users (eastern-most extent of the Proposed Development Site)	Inhalation of ground gases	Unlikely to low likelihood	Mild	Very low to low risk
	On-site and off-site users – Current residential users (eastern-most extent of the Proposed Development Site)	Inhalation of ground gases	Unlikely to low likelihood	Mild	Very low to low risk
	On-site and off-site users –	Inhalation of ground gases	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline
	Public open space users at Keadby Common				
	On-site and off-site property receptors – Keadby 1 Power Station buildings and services Residential buildings Other commercial buildings	Exposure to explosive gases	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] Sites are assessed against baseline condition without construction of the Proposed Development. [2] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. The on-site and off-site receptors were considered to have the same risk at baseline outcome. Therefore, have been assessed together within the same row.					

Table 60: During construction CSM: peat deposits located within and outside of the Proposed Development Site

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
Potential low levels of ground gas – methane and carbon dioxide.	On-site and off-site users – Current commercial users at Keadby 1 Power Station Other current commercial users (eastern-most extent of the Proposed Development Site)	Inhalation of ground gases	Unlikely to low likelihood	Mild	Very low to low risk
	On-site and off-site users – Current residential users (eastern-most extent of the Proposed Development Site)	Inhalation of ground gases	Unlikely to low likelihood	Mild	Very low to low risk
	On-site and off-site users – Public open space users at Keadby Common	Inhalation of ground gases	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk during construction
	On-site and off-site property receptors – Keadby 1 Power Station buildings and services Residential buildings Other commercial buildings	Exposure to explosive gases	Unlikely	Minor	Very low risk

Notes/ assumptions;

[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary.

- [2] During construction, standard mitigation procedures are assumed to be implemented in accordance with a CEMP.
- [3] Construction workers have been excluded from the assessment due to the use of PPE/risk management protocols and in accordance with CIRIA C692, 2010.

[4] The potential for ground gas from peat deposits is not considered significant enough to result in an increased risk during construction.

Table 61: Post-construction CSM: peat deposits located within and outside of the Proposed Development Site

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
Potential low levels of ground gas – methane and carbon dioxide.	On-site and off-site users – Current commercial users at Keadby 1 Power Station Other current commercial users (eastern-most extent of the Proposed Development Site)	Inhalation of ground gases	Unlikely to low likelihood	Mild	Very low to low risk
	On-site and off-site users – Current residential users (eastern-most extent of the Proposed Development Site)	Inhalation of ground gases	Unlikely to low likelihood	Mild	Very low to low risk
	On-site and off-site users – Public open space users at Keadby Common	Inhalation of ground gases	Unlikely	Minor	Very low risk
	On-site and off-site users – Future commercial users at Keadby 2 and Keadby 3 Power Stations	Inhalation of ground gases	Unlikely	Minor	Very low risk
	On-site and off-site property receptors –	Exposure to explosive gases	Unlikely	Minor	Very low risk

Source	Receptor	Pathway	Probability	Consequence	Risk post-construction
	Keadby 1 Power Station buildings and services Residential buildings Other commercial buildings				
	On-site and off-site property receptors – Future Keadby 2 and Keadby 3 Power Station buildings and services	Exposure to explosive gases	Unlikely	Minor	Very low risk
Notes/ assumptions;					
[1] 'On-site' and 'off-site' are terms used here to describe whether a receptor is at or adjacent (within 50m) of the potential areas of contamination being assessed. It does not refer to whether the receptor is within or outside of the Proposed Development Site boundary. [2] Assumes construction works are complete and remediation has been carried out where necessary on areas within the Proposed Development boundary. [3] A range may be given as remediation strategies will vary in design. Remediation strategies may involve source removal or pathway intervention as appropriate. [4] Assumes that for the peat areas located outside of the Proposed Development Site boundary, that upon completion of construction the risks to the identified receptors will be as it was at baseline, as no direct intervention to remediate these areas will have taken place.					

Table 62: Peat deposits located within and outside of the Proposed Development Site – significance of effect assessment

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
On-site and off-site users – Commercial users Inhalation of ground gases.	Very low to low risk	Very low to low risk	Very low to low risk	Neutral	Neutral
On-site and off-site users – Residential users Inhalation of ground gases.	Very low to low risk	Very low to low risk	Very low to low risk	Neutral	Neutral
On-site and off-site users – Public open space users Inhalation of ground gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
On-site and off-site users – Future commercial users Inhalation of ground gases.	N/A	N/A	Very low risk	N/A	N/A
Property receptors – Buildings and services (on-site and off-site) Exposure to explosive gases.	Very low risk	Very low risk	Very low risk	Neutral	Neutral
Future property receptors – Buildings and services (on-site and off-site) Exposure to explosive gases.	N/A	N/A	Very low risk	N/A	N/A
Overall significance				**Neutral**	**Neutral**
Notes/ assumptions;					
[1] The construction column assumes that a CEMP will be in place to mitigate impacts from construction					