



Dice
Environmental

Slip End Farm
Phase 1 Geo-Environmental Report

30/05/2023

Ref: 101029

Version 1.0

Site Slip End Farm,
Baldock,
SG7 6SG

Client Northern D & Sons

Date 30/05/2023

Project Reference 101029

Prepared by:

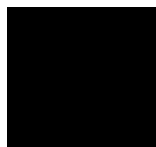


Abbie Davies BSc AMIEnvSc
Graduate Geo-Environmental
Consultant

Date

23rd May 2023

Reviewed by:



Jake Bayne MSc MEnvSc CEnv
Director

Date

30th May 2023

Authorised by:



Jake Bayne MSc MEnvSc CEnv
Director

Date

30th May 2023

Executive Summary	
Site Description	The site is located in the countryside and contains the north-eastern section of Slip End Farm. The site is accessed off of a track in the south of the site, which leads off of the A505 to the south of Slip End Farm. There are multiple buildings on the site, with a smaller structure in the north-east. The buildings are surrounded by piles discarded waste comprising wooden pallets, metal bars, likely ACMs (sheeting & cement) and miscellaneous plastic items. Multiple potential sources of contamination were identified on site, including an oil tank, large plastic containers of chemicals (e.g. manganese), two steel oil drums and a large pile of asbestos sheeting & cement in the approximal centre of the site. Asbestos sheeting was also identified on some of on-site the structures. The site contained overgrown vegetation, such as shrubs and grasses, in places mostly focused around the existing structures. Whilst grasses covered the majority of the land in the north and east of the site, the access road and paths to the buildings were comprised of cracked concrete.
Proposed Development	The proposed development on site is to include the demolition of the existing on-site structures, and subsequent erection of residential properties with associated gardens and parking facilities.
Geology	Geological maps of the area show the site not to be underlain by superficial strata. Geological maps of the area show the site to be situated upon bedrock of the Holywell Nodular Chalk Formation and New Pit Chalk Formation, comprising Chalk.
Hydrogeology	The underlying solid geology is classified as an Primary Aquifer, comprising geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. The site is located within Source Protection Zone 1. There is a groundwater abstraction license recorded 325m west of the site.

Hydrology	There is an inland river (Cat Ditch) 55m south-east of the site.
Radon	The Groundsure reports included within Appendix B shows that the site is located within an area where the percentage of homes above the radon action level is below 1%. Therefore, it is considered that no specific radon protection measures are required for this development.
Ground Gas	No significant potential source of ground gas has been identified for this site. Should significant hydrocarbon contamination be identified during intrusive investigation, this should be re-considered.
Conclusions / Recommendations	This report concludes that there is at least 'Moderate to High' potential risk to future site users and 'Moderate' potential risk to controlled waters. In order to determine whether the potential contaminants of concern are present on-site, and if so in what quantities, a Phase II intrusive investigation is recommended. Therefore, the following recommendations are considered appropriate for this development: - Investigation, logging and sampling of general ground conditions (superficial deposits and made ground soils) to assess the variability of soils. It is recommended that the Phase 2 investigation be carried out following site clearance of existing structures & ACMs. - No significant potential source of ground gas has been identified for this site. Should significant hydrocarbon contamination be identified during intrusive investigation, this should be re-considered. - Chemical laboratory testing of soils for a range of contaminants, including generic contaminants as well as those specifically identified within this report's conceptual site model. - It is considered that geo-technical in-situ and laboratory testing be carried out alongside any contamination investigation. This may include – but not be limited to –

	infiltration testing, plasticity index testing, and attaining shear strength of underlying cohesive materials. - The production of a Phase II Geo-Environmental Report to present the above-mentioned findings, conclusions and recommendations. - An asbestos management survey to be undertaken to locate and assess the extent of any asbestos or asbestos containing materials (ACMs) that may be present on site. These recommendations are considered appropriate based on the site's history, site walkover observations, and scale of the proposed development. These conclusions & recommendation should be approved by the local planning authority.
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1. Introduction

1.1. Client Brief

Dice Environmental was instructed by Northern D & Sons to undertake a Phase 1 Geo-Environmental Report for the site known as 'Slip End Farm, Baldock, SG7 6SG'.

The proposed development on site is to include the demolition of the existing on-site structures, and subsequent erection of residential properties with associated gardens and parking facilities.

The site location plan and layout are included within Appendix A.

This Phase I Geo-Environmental Assessment includes:

- A record of a site inspection walkover, subsequent site description, and appraisal of any observed land contamination, or potential contaminative sources.
- A site description and appraisal of any potential land contamination, or potential contaminative sources.
- A review of historical maps for the site and surrounding area, with respect to potential sources of contamination.
- A review of the general expected Environmental setting, including geology, hydrogeology and hydrology.
- The development of a preliminary conceptual site model based on the concept of 'contaminant linkage', which considers potential contamination sources, pathways and receptors.
- Conclusions and Recommendations drawn from the qualitative risk assessment.
- An executive Summary.

1.3. References

Assessment guidance and site-specific information has been sought from the following locations:

- EA/DEFRA (2020) LCRM: Land contamination Risk Management (Supersedes (2004), CLR11: Model Procedures for the Assessment of Land Contamination).
- CIRIA. (2001). *Contaminated land risk assessment A guide to good practice*.
- DEFRA. (2018). *MAGIC*. Retrieved from Magic Map: <http://magic.defra.gov.uk/MagicMap.aspx>

- Environment Agency. (March 2017). *New Groundwater Vulnerability Mapping Methodology in England and Wales. Reference SC040016/R. Environment Agency.*
- Environment Agency. (2008). *R&D Publication 66. Guidance for the Safe Development of Housing on Land Affected by Contamination.*
- Scivyer, C. (2015). *BRE 211. Radon: Guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment projects). Fifth Edition.*
- The Coal Authority. (2018). *Coal Authority Interactive Viewer. Retrieved from <http://mapapps2.bgs.ac.uk/coalauthority/home.html>*

1.4. Limitations

The recommendations and opinions expressed in this report are based on information obtained as part of the desk study or provided by others. Information provided from other sources is taken in good faith and Dice Environmental cannot guarantee its accuracy. The ultimate responsibility for any action taken, or lack thereof, shall lie with the developer.

This report does not include specific investigation for the presence of either Potential Asbestos Containing Material (PACM) or Japanese Knotweed at the subject site however, if obvious evidence of either is observed during site walkover, details will be provided in this report. Specialist contractors should be commissioned to make detailed assessments and recommendations if these materials are suspected. This report takes into account coal mining areas as a potential source of contamination (ground gas (CH_4 & CO_2)), however makes no comment on other potential associated concerns (geo-technical).

The information contained in this report is intended for the use of Northern D & Sons and Dice Environmental can take no responsibility for the use of this information by any third party or for uses other than that described in this report or detailed within the terms of our engagement.

2. Site Information

2.1. Site Location

The site is located approximately 7.79km south-west of Royston Town Centre. The national grid reference (NGR) for the approximate centre of the site TL 286 371.

A site plan is presented within Appendix A.

2.2. Site Description

A site walkover was undertaken on the 27th April 2023 by Dice Environmental.

The site is located in the countryside and contains the north-eastern section of Slip End Farm. The site is accessed off of a track in the south of the site, which leads off of the A505 to the south of Slip End Farm.

There are multiple buildings on the site, with a smaller structure in the north-east. The buildings are surrounded by piles discarded waste comprising wooden pallets, metal bars, likely ACMs (sheeting & cement) and miscellaneous plastic items.

Multiple potential sources of contamination were identified on site, including an oil tank, large plastic containers of chemicals (e.g. manganese), two steel oil drums and a large pile of asbestos sheeting & cement in the approximal centre of the site. Asbestos sheeting was also identified on some of on-site the structures.

The site contained overgrown vegetation, such as shrubs and grasses, in places mostly focused around the existing structures. Whilst grasses covered the majority of the land in the north and east of the site, the access road and paths to the buildings were comprised of cracked concrete.

2.3. General Area Context

North: To the north of the site there are predominantly open fields. There is a railway approximately 215m north-west.

East: To the east of the site there are predominantly open fields. There is a cat and dog kennels approximately 600m north-east.

South: 60m south of the site there is the A505, beyond which there are predominantly open fields, as well as a kennels approximately 400, south-west.

West: To the west of the site there are predominantly open fields.

3. Geo-Environmental Setting

3.1. Geology

Geological maps of the area show the site not to be underlain by superficial strata.

Geological maps of the area show the site to be situated upon bedrock of the Holywell Nodular Chalk Formation and New Pit Chalk Formation, comprising Chalk.

3.2. Hydrogeology

The underlying solid geology is classified as an Primary Aquifer, comprising geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale.

The site is located within Source Protection Zone 1.

There is a groundwater abstraction license recorded 325m west of the site.

3.3. Hydrology

There is an inland river (Cat Ditch) 55m south-east of the site.

3.4. Radon

The Groundsure reports included within Appendix B shows that the site is located within an area where the percentage of homes above the radon action level is below 1%. Therefore, it is considered that no specific radon protection measures are required for this development.

3.5. Historical Coal Mining

The site is not located within a coal mining reporting area as defined by the Coal Authority.

3.6. Landfills

The Groundsure reports included within Appendix B show that:

- There are no active landfills within 500m of the site.
- There are no historical landfills within 500m of the site.

3.7. Industrial Land Use

The Groundsure reports included within Appendix B show that:

- There are no wastewater treatment works recorded within 250m of the site.
- There is 1 petrol stations 432m south-west of the site, from 1974.

Currently, the only recorded industrial land use proximal to the site is a tank 85m south-west. However, during the site walkover, an oil tank, oil drums and chemical containers were also identified on the site, which is currently used as a farm.

Historically, there was some proximal industrial land use, including cuttings in the north and south of the site, the closest being 196m south-west. In addition, there was a pumping station 190m west, multiple unspecified tanks from 87m south-west, unspecified works 367m east and an unspecified heap 474m north. There was also an electricity substation 353m west, around 1974 to 1997.

4. Site History

4.1. Historical Map Review

Map Date	Significant Changes on Site	Significant Changes in the Surrounding Area
1877	The site is an empty plot.	There is a railway approximately 215m north-west. There is a pub approximately 10m south-east.
1896	A small building has been developed in the south of the site.	No significant change.
1951	Multiple small structures are now present on the site.	No significant change.
1977	The previous structures appear to no longer exist. Slip End Farm has a building extending into the south of the site.	Slip End Farm has been developed to the south of the site.
1982	No significant change.	There is a works and a poultry house approximately 350m north-east. There is a pumping station approximately 300m south-west.
1993	Additional farm buildings have been developed on-site, in the east, south-west and north.	There is a tank approximately 90m south-west.
2023	No significant change.	The works and poultry houses have been removed. There is no longer a pumping station in the south-west.

Table 1: Summary of site targeted historical map data.

A copy of the historical maps used for this review are included within Appendix C

4.2. Summary of Historical Data

A review of the historical mapping resources from between 1877 – 2023, provided by Groundsure, show that the site was an undeveloped plot of land until a small building, likely a part of the adjacent pub, encroached onto the site by 1896. By 1951, multiple, small, unidentified structures were built on site. By 1977, the adjacent pub had been replaced by Slip End Farm, with multiple of the farm's buildings extending into the site by 1993. This is how the site remains in the present day.

The site is located in the countryside, and there was little change to the surroundings between 1877 and 2023. The pub to the south was replaced by a farm by 1977. By 1982, a works, poultry houses and a pumping station were present, yet these were removed by 2023. By 1993, there was a tank approximately 90m south-east of the site.

5. Conceptual Site Model

5.1. Potential Sources

Significant potential sources of contamination which have been identified for the site include:

- Made ground across the site associated with the oil drums, oil tank and asbestos containing materials identified on site during the walkover, previous on-site structures now demolished, and the railway approximately 215m north-west. The potential contaminants of concern associated with this potential source include:
 - o Heavy Metals, Polyaromatic Hydrocarbon (PAHs), Petroleum Hydrocarbons (TPH), Volatile and Semi-Volatile organic compounds (VOCs & SVOCs), vapours, asbestos containing materials (ACMs) and fibres.
- Use and spillages of chemicals identified on the site during the walkover and associated with the current use of the site as a farm. The potential contaminants of concern associated with this potential source include:
 - o Pesticides, herbicides and fertilisers.
 - o Manganese.

No significant potential source of ground gas has been identified for this site. Should significant hydrocarbon contamination be identified during intrusive investigation, this should be re-considered.

5.2. Potential Pathways

Pathways to human receptors:

- Direct dermal contact or ingestion of soils, or inhalation of dust/fibres and/or vapours (i.e. human interaction with surface and subsurface materials).
- The migration and accumulation of ground gases through permeable sub-surface materials and/ or preferential pathways.

Pathways to Environmental (controlled waters) receptors:

- Lateral and vertical migration of groundwater through permeable sub-surface materials and/ or preferential pathways.

5.3. Potential Receptors

The potential receptors for the site include:

- Site workers during the redevelopment of the site.
- Intended end users of the site (residents).
- The river 55m south-east of the site.
- The Primary Aquifer within the underlying bedrock strata.

6. Phase I Conceptual Site Model

Human Receptors				
Sources	Potential Contaminants of Concern	Pathway	Receptor	Risk
Made ground across the site associated with the oil drums, oil tank and asbestos sheeting identified on site during the walkover, previous on-site structures now demolished, and the railway approximately 215m north-west. Use and spillages of chemicals identified on the site during the walkover and associated with the current use of the site as a farm. No significant potential source of ground gas has been identified for this site.	Heavy Metals, Manganese, Polyaromatic Hydrocarbon (PAHs), Petroleum Hydrocarbons (TPH), Volatile and Semi-Volatile organic compounds (VOCs & SVOCs), vapours, pesticides, herbicides, fertilisers, asbestos containing materials (ACMs) and fibres.	Direct dermal contact or ingestion of soils, or inhalation of dust/fibres and/or vapours (i.e. human interaction with surface and subsurface materials).	Site workers during the redevelopment of the site.	Moderate to High
			Intended end users of the site (residents).	
		The migration and accumulation of vapours and ground gases through permeable sub-surface materials and/ or preferential pathways.	Intended end users of the site (residents).	Low to Moderate

Environmental Receptors (Controlled Waters)				
Made ground across the site associated with the oil drums, oil tank and asbestos sheeting identified on site during the walkover, previous on-site structures now demolished, and the railway approximately 215m north-west. Use and spillages of chemicals identified on the site during the walkover and associated with the current use of the site as a farm.	Heavy Metals, Polyaromatic Hydrocarbon (PAHs), Petroleum Hydrocarbons (TPH), pesticides, herbicides & fertilisers.	Lateral and vertical migration of groundwater through permeable sub-surface materials and/ or preferential pathways.	The Primary Aquifer within the underlying bedrock strata. The river 55m south-east.	Moderate

7. Conclusions and Recommendations

An appraisal regarding the potential presence of on-site contamination has been carried out through review of historical maps, environmental data and a site walkover.

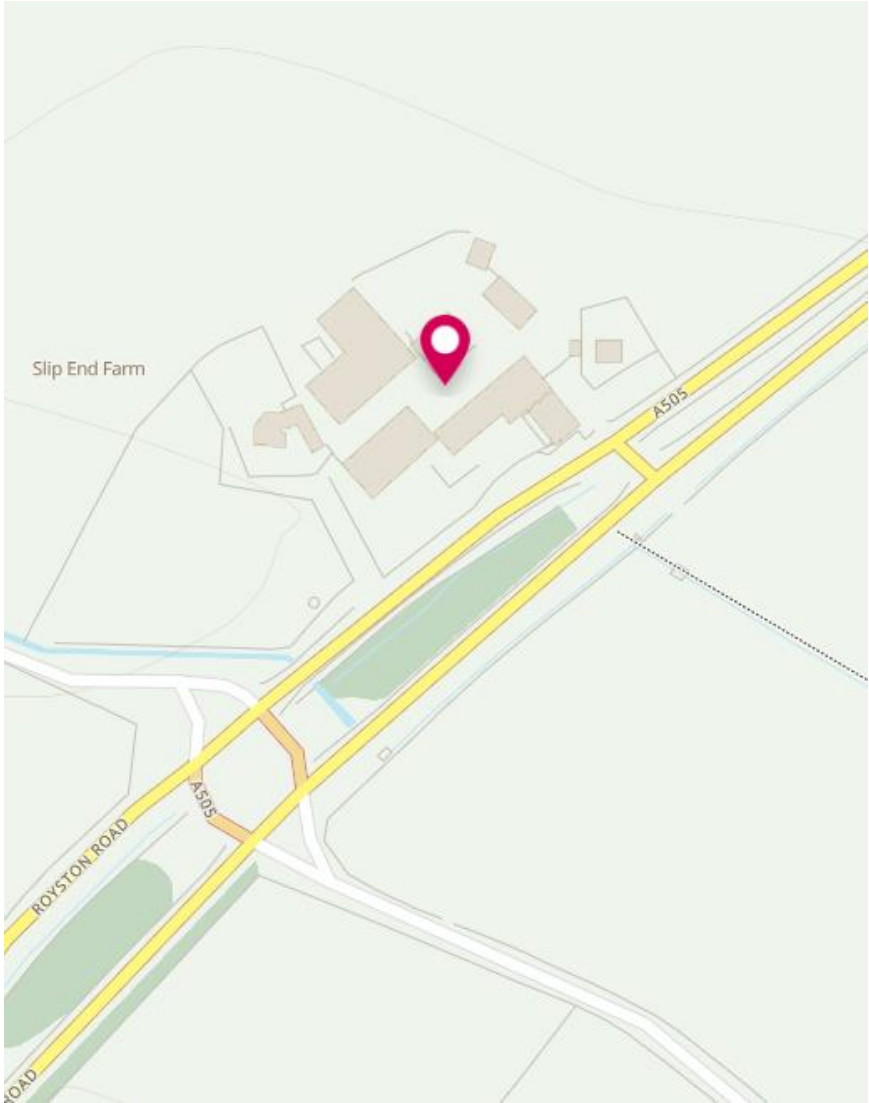
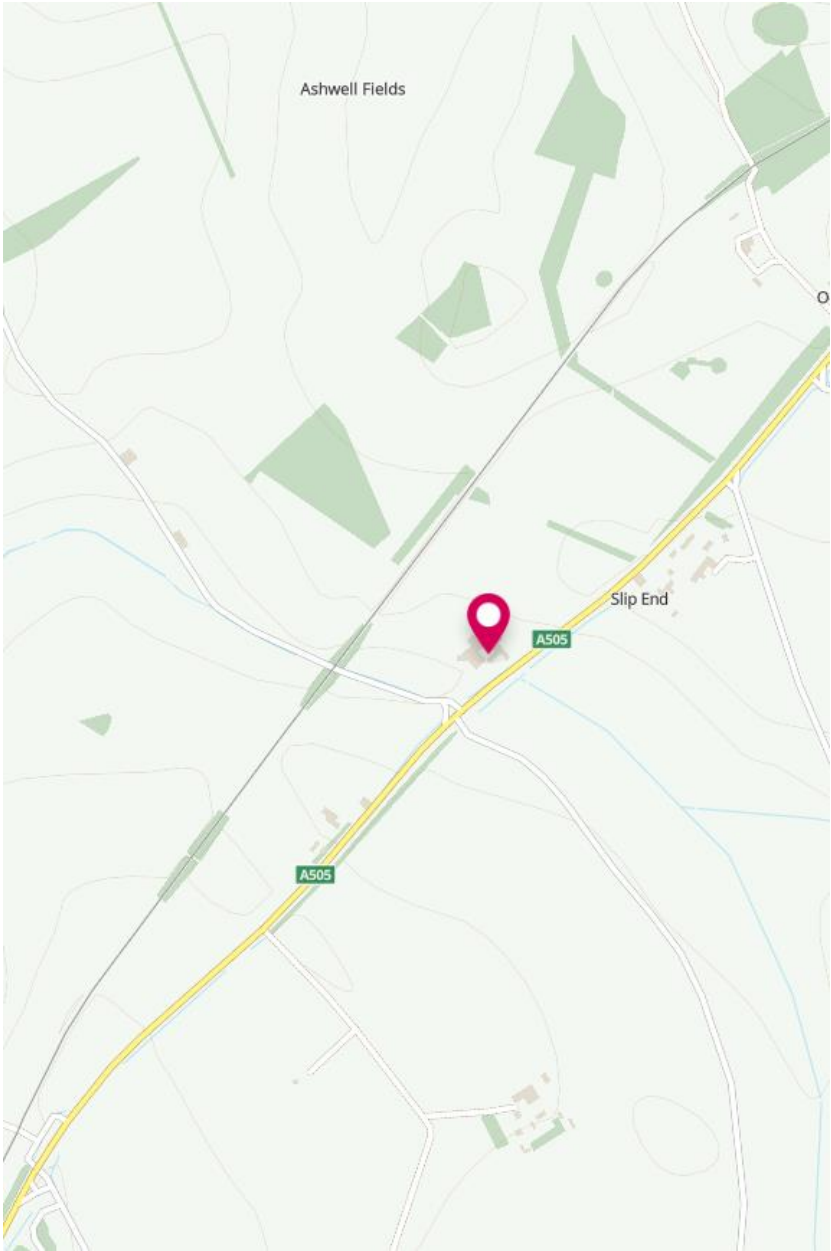
This report concludes that there is at least 'Moderate to High' potential risk to future site users and 'Moderate' potential risk to controlled waters. In order to determine whether the potential contaminants of concern are present on-site, and if so in what quantities, a Phase II intrusive investigation is recommended.

Therefore, the following recommendations are considered appropriate for this development:

- Investigation, logging and sampling of general ground conditions (superficial deposits and made ground soils) to assess the variability of soils. It is recommended that the Phase 2 investigation be carried out following site clearance of existing structures & ACMs.
- No significant potential source of ground gas has been identified for this site. Should significant hydrocarbon contamination be identified during intrusive investigation, this should be re-considered.
- Chemical laboratory testing of soils for a range of contaminants, including generic contaminants as well as those specifically identified within this report's conceptual site model.
- It is considered that geo-technical in-situ and laboratory testing be carried out alongside any contamination investigation. This may include – but not be limited to – infiltration testing, plasticity index testing, and attaining shear strength of underlying cohesive materials.
- The production of a Phase II Geo-Environmental Report to present the above-mentioned findings, conclusions and recommendations.
- An asbestos management survey to be undertaken to locate and assess the extent of any asbestos or asbestos containing materials (ACMs) that may be present on site.

These recommendations are considered appropriate based on the site's history, site walkover observations, and scale of the proposed development. These conclusions & recommendation should be approved by the local planning authority.

APPENDIX A



Title
Site Location

Reference
101029

Date
22/05/2023

Site Address

**Slip End Farm,
Baldock,
SG7 6SG**

Legend

 **Approximate Site Centre**

Scale
NTS

Drawn
AMD

Figure Number
Fig.1



Title
Site Layout

Reference
101029

Date
22/05/2023

Site Address

Slip End Farm,
Baldock,
SG7 6SG

Legend

Scale
NTS

Drawn
AMD

Figure Number
Fig.2



Title
Photos

Reference
101029

Date
22/05/2023

Site Address

Slip End Farm,
Baldock,
SG7 6SG

Legend

Scale
NTS

Drawn
AMD

Figure Number
Fig.3



Title
Photos

Reference
101029

Date
22/05/2023

Site Address

Slip End Farm,
Baldock,
SG7 6SG

Legend

Scale
NTS

Drawn
AMD

Figure Number
Fig.4



AST



AST



Oil drums.



Potential asbestos sheeting.

Title
Photos

Reference
101029

Date
22/05/2023

Site Address

Slip End Farm,
Baldock,
SG7 6SG

Legend

Scale
NTS

Drawn
AMD

Figure Number
Fig.5