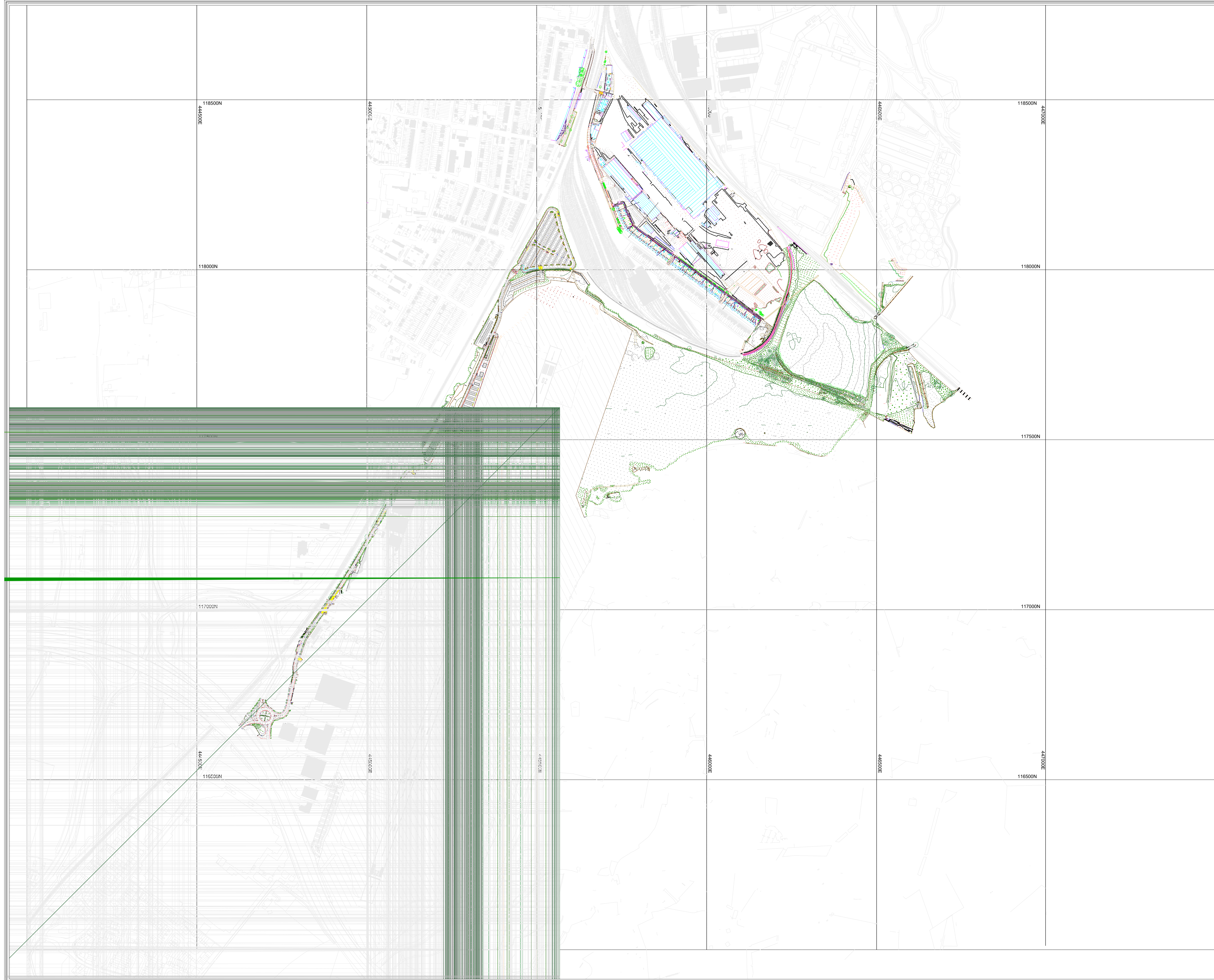




Station Information:

Station	Easting (m)	Northing (m)	Level (m)
GH1	445872.729	117821.022	12.703
GH2	445871.120	117908.156	12.708
GH3	445710.303	117910.532	12.650
GH4	445599.143	118005.236	14.517
GH5	445599.143	118005.236	14.517
GH6	445608.859	117846.933	10.150
GH7	445608.859	117846.933	10.150
GH8	445633.013	117453.433	13.902
GH9	445633.013	117453.433	13.902
GH10	445630.700	118054.266	13.505
S1	445635.121	117911.997	14.072
S2	445635.121	117911.997	14.072
S3	445637.076	117814.754	15.374
S4	445637.076	117814.754	15.374
S5	445623.285	117523.236	12.494
S6	445623.285	117523.236	12.494
S7	445611.134	117402.595	11.935
S8	445611.134	117402.595	11.935
S9	444868.431	117313.922	11.232
S10	444868.431	117313.922	11.232
S11	444692.586	116905.890	11.040
S12	444692.586	116905.890	11.040
S13	444763.783	116636.633	11.223
S14	444763.783	116636.633	11.223
S15	444684.022	116720.800	11.809

OS Note:

Survey oriented to the client provided SE Surveying
Survey 021-06/18, Greenhatch Group accept no responsibility
for the accuracy of the provided survey.
No scale factor has been applied to the survey therefore the
coordinates shown are arbitrary & not true O.S. Coordinates
which have a scale factor applied.
Please refer to Survey Station Table to enable establishment of
the on-site grid and datum.
The Ordnance Survey tile is to be used as a guide only.
Some services may have been omitted due to parked vehicles.

Buildings		Legend:	
	Cathedral/Cable		PC (computer)
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	Cathedral Cable		BoBoat

2	25/11/24	Navigation Quarter	TS	GH230
1	24/01/22	Eastern Woodland & Rail	TS	GH123



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- Topographical Surveys
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CLIENT
Blocwork (Eastleigh) LLP

PROJECT

**Navigation Quarter
Southampton Airport
SO18 2NL**

Topographical Survey

SCALE A1@ 1: 5000	DATE December 21
DRAWN TS	QUALITY REF GH12413

Level datum	See note
Grid orientation	See note

Job number	42270
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Drawing No.	Rev.
42270_T	2

Comments

This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

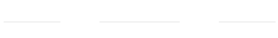
Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes

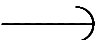
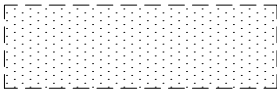
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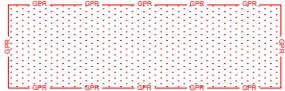
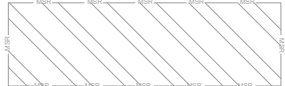
UTILITY LINETYPES

Air Line	
British Telecom	
British Telecom Overhead	
CCTV / Cable Television	
Communication Cable	
Drainage - Combined Water	
Drainage - Foul Water	
Drainage - Storm Water	
Drainage - Unknown Water	
Drainage - Trade Effluent Water	
Drainage - Combined Water - Assumed/TFR	
Drainage - Foul Water - Assumed/TFR	
Drainage - Storm Water - Assumed/TFR	
Drainage - Unknown Water - Assumed/TFR	
Drainage - Trade Effluent Water - Assumed/TFR	
Drainage - Approximate Pipe Size/Extents	
Earth Cable	
Empty Duct	
Electric & Comms	

Electric Low Voltage	
Electric High Voltage	
Electric - Unknown Voltage	
Electric Overhead	
Fibre Optic	
Fuel Line	
Gas Line	
Gauge Line	
GPR Line	
Heating Pipes	
Offset Fills	
Oil Pipe	
Rising Main	
Sensor Cable	
Telecom	
Traffic Light Signals	
Trench Scar	
Unknown	
Vapour Recovery	
Vent Line	
Virgin Media	
Water	

UTILITY SURVEY INFORMATION

Contracted Survey Area	
Depth to Top of Service (m)	0.40d
End of Trace / Record	 EOT
Head of Run	HoR
Weak Signal	WS
Taken From Records	TFR
Off Survey Area	OSA
Back Drop	BD
Silt Level	SL
Flow Level	FL
Above Ground	A/G
Unable to Locate	UTL
Unable to Survey	UTS
Unable to Raise (cover)	UTR
Unable to Trace	UTT
Unable to Survey	
Approximate Chamber Extents	

Assumed Route	AR
Assumed Connection	ACP
Sound Connection	S/C
Sonde Stopped	S/S
No Visible Access	NVA
No Visible Exit	NVE
No Visible Pipes	NVP
No Visible Services	NVS
No Depth Indicated	NDI
Base Level	BL
High Level	HL
Top of Pipe / Top of Valve	ToP / ToV
Landing Level	LL
Rubble Level	RL
No Signal	N/S
Heavily Silted	H/S
Approximate Location (ApL)	
GPR Anomaly	
Multiple Services Route	

APPENDIX C – PHASE 1 DESK STUDY REPORT



**Intelligent
Ground
Solutions**



Preliminary Risk Assessment

Navigator Quarter, Southampton
Mitchell Way, SO50 5QJ

For Blocwork (Eastleigh) LLP and AGS Airports Group Limited

27 February 2025

Report ref. 25/4362.A.1

Report ref. 25/4362.A.1

Revision log

Issue No.	Date	Description
1	27 February 2025	Issue of report to Client

Report Prepared By	Signature	Date
Jessica Rowe Principal		27 February 2025
Report Reviewed By	Signature	Date
Gemma Tatton Principal		27 February 2025
Report Authorised By	Signature	Date
Tom Horner Associate Director		27 February 2025

Executive Summary

Brief	The study was undertaken prior to the proposed redevelopment of the site for a commercial/light industrial end use to assess potential contamination risks.
Site Location	Navigator Quarter, Southampton, Mitchell Way, SO50 5QJ. Grid reference 445940, 117680. The site currently comprises an access road and disused car parking area associated with Southampton International Airport in the west, fallow grassland in the east and northeast, separated by a historical railway embankment which is densely vegetated. Infrastructure (blast barriers and lighting) associated with the adjacent runway are present in the north and southeast of the site.
Site History	Earliest available historical mapping shows that the site largely comprised agricultural land with a farm (North Stoneham Farm) in the southeastern corner. By the early 1900s a railway line was noted along the northern boundary, dissecting the site in an approximate east-west orientation. Two gravel pits were also noted during this time in the northwestern and southeastern corners. The site has been associated with a use as an airfield/airport since 1910, originally known as Eastleigh Airfield. The area was then used by the United States during WWI and by the RAF in WWII, with the area known as RAF Eastleigh before becoming RAF Southampton, and later RNAS Eastleigh (HMS Raven) as a training ground for the Royal Navy. Development was historically present in the southern area associated with the military use (likely barracks) and currently in the northwest associated with disused airport car parking. The majority of the site (eastern and northeastern field) has remained undeveloped throughout history.
Environmental Setting	The site is considered to be of a moderate environmental sensitivity given the presence of the SSSI to the east associated with the River Itchen, the underlying Secondary A and Secondary Undifferentiated Aquifers at the site, lack of an SPZ or potable water abstraction point within 1 km.
Contamination Potential Risk	Potential soil and groundwater contamination may include fuels/hydrocarbons, polycyclic aromatic hydrocarbons, heavy metals, asbestos and potentially per- and polyfluoroalkyl substances associated with the airport use and firefighting run-off. Due to the historical use of the site and wider area and potential sources identified, Geo² considers the risk to site end users from contaminants within shallow soils and the risk from elevated ground gas concentrations to be Low to Moderate. Significant on-site sources of contamination have not been identified, however, the site is in close proximity to the River Itchen, a sensitive water receptor, as such, the risk to controlled waters is considered to be Low to Moderate. The off-site rail yard to the north is known to have impacted groundwater with hydrocarbons (including free phase product) in the northern central area. It is unknown whether remediation works have been completed, however, free phase product was most recently identified in September 2023. As such the risk from off-site sources is considered Moderate to High.
Development Considerations	Based on the available information, it is anticipated that the ground conditions at the site will likely comprise Made Ground underlain by superficial clay and gravel followed by bedrock of the London Clay Formation, or Wittering Formation in the east. Alluvium may also be present in the east given the proximity to the River Itchen. Groundwater is anticipated at c. 3-4 m bgl.

	The key geotechnical considerations (amongst others) of the site relate to the potential for Made Ground associated with historical development. This risk should be further assessed through intrusive ground investigation.
Recommendations	Geo ² recommends that an intrusive investigation be undertaken to assess the potential for contamination, to refine the site-specific ground model and groundwater regime beneath the site. Further enquiries should also be made as to whether remediation has been undertaken on the rail yard to the north.
This table is a summary only, full details and limitations of the assessment are provided within the main body of the report.	

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Appendix D – Risk Assessment Terminology

Appendix E - Council Enquiry Response

1.0 Introduction

Geo² Limited were commissioned by Blocwork (Eastleigh) LLP and AGS Airports Group Limited to conduct a Preliminary Risk Assessment of a site known as Navigator Quarter, Southampton located off Mitchell Way, SO50 5QJ. The site is approximately 32.62 hectares in area and located at grid reference 445940, 117680.

The study was undertaken prior to proposed redevelopment of the site for a commercial/light industrial end use.

1.1 Scope of Works

The Preliminary Risk Assessment, consisting of desk study and site walkover, was conducted in order to assess the potential for contaminant sources to be present on site, resulting from the past use of the site and current land use.

The desk study was also undertaken to identify possible sensitive environmental receptors that may be at risk from sources, if present on site, within the locality of the site.

The scope of the Preliminary Risk Assessment has given consideration to guidance on Land Contamination: Risk Management pages of the GOV.UK web pages, the relevant requirements of the National Planning Policy Framework (NPPF) (as amended, 2024) (paragraphs 187 & 196-197) and the Planning Practice Guidance (Land Affected by Contamination).

2.0 Description of the Site and Surroundings

2.1 Site Description

The site is located approximately 6 km north of Southampton city centre. Figure 1 in Appendix A shows the location of the site.

The site currently comprises an access road and disused car parking associated with Southampton International Airport in the west, fallow grassland in the east and northeast separated by a historical railway embankment which is densely vegetated. Infrastructure (blast barriers and approach lighting) associated with the adjacent runway are present in the north and southeast of the site. The site is accessed through the car parking in the northwest and via a bridge beneath the railway line along the northeastern boundary.

The area shown within the red site boundary on Figure A below, will be referred to throughout this document as 'the site'.



Figure A: Site Location Plan. Site boundary in red Contains © Crown Copyright and Database Right 2024

2.2 Site Walkover

A site walkover was undertaken on 16th January 2025, with a photographic survey included in Appendix B. The site walkover findings are detailed below.

The site was accessed via Mitchell Way in the northwestern corner. Mitchell Way led to a tarmac car park and a mixed gravel and tarmac car park in the northwestern-most corner of the site. An area of disused grassland was also noted adjacent to the car parks with sporadic fragments of concrete and metal noted on the surface.

The site wrapped around the northern extent of Southampton Airport runway comprising a gravel track and densely vegetated bund. Runway approach lights were noted adjacent to the site in this area. The site was separated from the runway and associated areas by a c. 2.50 m metal wire fence.

The majority of the site comprised vacant grassland separated by a densely vegetated embankment in the central area running in an east to west orientation. This embankment was considered to

represent a former railway line. Concrete blocks and metal fragments were noted in the material of the embankment where bare ground was visible. Access to the northeastern field was via foot over the embankment or via a metal gate along the northern boundary. The northern access was noted to be flooded at the time of the walkover by c. 0.4 m of water. The track off-site to the north passed beneath the railway line via a brick tunnel.

Further airport infrastructure was noted in the larger southern field comprising a radar station and windsock flagpoles. In addition, a series of third-party boreholes were noted in the northern central area, which were understood to relate to the investigation of off-site hydrocarbons from the adjacent railway yard.

The remains of former buildings could be seen in the southern-most area of the site comprising remnant brick walls and concrete floors with rubble, engines, metal and corrugated sheeting. No evidence of asbestos containing materials were noted, however, the area was densely vegetated as such, the potential cannot be discounted.

An above ground storage tank was noted off-site adjacent to the central northern area of the site.

The site was bounded by the airport in the east and largely by vegetation, hedgerow and trees along the eastern and northern boundaries.

2.3 Site Surroundings

The surrounding land uses of the site are summarised below.

Direction	Land Use
North	A rail yard, commercial properties and residential housing to the northwest. Sewage treatment works to the northeast and agricultural land beyond.
East	River Itchen and Itchen Valley Country Park.
South	Southampton Airport to the southwest. Itchen Valley Country Park and the River Itchen to the southeast.
West	Residential properties beyond the A335.

3.0 Desk Study

3.1 Desk Study Data

Information regarding the environmental setting of the site was obtained from the Envirocheck report, which collated information from a variety of sources. A copy of the Envirocheck report is presented in Appendix C.

Where indicated in below, the data from the Envirocheck report has been supplemented with additional information obtained from freely available online data.

Site Geology	British Geological Survey (BGS) data indicates that the site is underlain by superficial River Terrace Deposits (clay and silt) followed by bedrock of the London Clay Formation (clay, silt and sand) in the west and the Wittering Formation (sand, silt and clay) in the east. Superficial deposits of Alluvium (clay, silt, sand and gravel) are mapped adjacent to the east of the site associated with the River Itchen, which may encroach onto site. Artificial ground is mapped along the northeastern boundary of the site, likely associated with the raised railway embankment in this area. A BGS borehole (Ref. SU41NE230) is located along the western boundary of the site, drilled in 1969. The ground conditions recorded comprised superficial clay, sand and gravel to c. 5.3 m bgl (below ground level) followed by clay and sand of the London Clay Formation to completion at 30.5 m bgl. Resting groundwater was identified at c. 3.0 m bgl. Two further BGS boreholes (Ref. SU41NE277 and SU41NE109) are located <50 m from the southeastern boundary of the site. The ground conditions in these locations comprised soft clay and peat at shallow depths (<2.0 m) followed by gravel and sand to c. 4.50 m bgl and firm to stiff bedrock clay below.
Ground Stability	The Envirocheck Report shows the site has the following risk ratings associated with these ground stability hazards: • Collapsible ground stability – <i>low risk to no hazard</i>; • Compressible ground stability – <i>moderate risk to no hazard</i>; • Ground dissolution – <i>no hazard</i>; • Landslide ground stability hazard – <i>very low risk</i>; • Running sands stability hazard – <i>low to very low risk</i>; and • Shrinking or swelling clay stability hazard – <i>moderate risk to no hazard</i>.
Mining	The Envirocheck Report records two BGS Recorded Mineral Sites located in the northwestern and southeastern corners of the site. Both entries relate to opencast quarrying of superficial sand and gravel and the operations are noted as ceased. Both quarries are noted on historical mapping and are likely infilled. Four BGS Recorded Mineral Sites are recorded within 250 m of the site, the nearest of which is located approximately 90 m northeast of the site and relates to opencast quarrying of sand and gravel; however, the operations are noted as ceased.

	The site is not within an area which may be affected by coal mining activity, therefore the risk to the proposed development from shallow coal mining is considered to be Low.
Radon	The site is in a low (less than 1% of homes are estimated to be at or above the Action Level) to intermediate probability radon area (up to 3 to 5% of homes are estimated to be at or above the Action Level). Given the site is located within two probability areas, it is recommended that the requirement for radon protective measures is confirmed with the Local Authority / Building Control. At this stage it would be prudent to allow for basic radon protective measures within new buildings.
Site Hydrogeology	The Environment Agency (EA) classify the superficial River Terrace Deposits as a Secondary (Undifferentiated) Aquifer and the Wittering Formation and Alluvium as Secondary A Aquifers. The London Clay Formation is classified as Unproductive Strata. The site is not located within a groundwater source protection zone (SPZ). According to the Envirocheck Report there are no licensed groundwater abstractions within 1 km of the site.
Site Hydrology	Drainage ditches are present along the northern central boundary and along the southern boundary of the site. In the wider area there are several tributaries of the River Itchen located to the east and south of the site. At its closest the river is approximately 170 m east. According to the Envirocheck Report there are three licensed abstractions from surface water located approximately 50 m east relating to abstraction for use in transport. There are two Pollution Incidents to Controlled Waters recorded within 250 m of the site, the nearest of which is located approximately 90 m west of the site and relates to the release of waste oil in July 1994, resulting in a Category 3 – Minor Incident. Eight Discharge Consents are recorded within 250 m of the site, the nearest of which is located approximately 75 m west of the site and relates to trade effluent discharge (site drainage) into groundwater via a soakaway. The licence is held by Southampton International Airport, dated July 2020, and is noted to be 'varied under EPR 2010'.
Waste and Infilled Land	According to the Envirocheck Report, there is a Historical Landfill Site registered in the northwest of the site associated with the former gravel pit. Details indicate that the licence was held by British Rail and deposited waste included household materials. No further pertinent information is supplied. The following entries are recorded within 250 m of the site: • One Historical Landfill Site located approximately 225 m west of the site, named as 'Land at Lakeside'. Details indicate that the licence was held by H T Hughes and Sons (Transport) Limited and deposited waste included inert waste; • Two Licensed Waste Management Facilities (locations), the nearest of which is located approximately 65 m east of the site and relates to a physical treatment facility. The licence is held by Aquavitrum Limited and was issued in February 2023;

	• Three areas of Potentially Infilled Land (non-water), the nearest of which is located approximately 85 m north of the site and was mapped in 1990; • One area of Potentially Infilled Land (water) located approximately 100 m northeast of the site, mapped in 1938; and • One Registered Landfill Site located approximately 235 m west of the site, operated by Sir Alfred Macalpine & Sons Ltd. The licence is dated January 1983 and has since lapsed/been cancelled or surrendered. Authorised waste is reported to have comprised excavated natural materials and household waste.
Local Industrial Land Use	There are two entries on the Substantiated Pollution Incident Register listed on-site in the central northern area. Both relate to the release of oils and fuel in July 2007 and February 2017. The impact to land is listed as Category 2 – Significant for both entries. No impact was noted to water or air. Within 250 m of the site there are; • One Integrated Pollution Control located approximately 230 m northeast of the site relating to mineral fibres (non-asbestos) within the Mineral Industry. The permit is dated April 2002 but has since been revoked; • Two Integrated Pollution Prevention and Controls, the nearest of which is located approximately 165 m northeast of the site and relates to the incineration of hazardous waste in an incinerator or co-incineration plant with a capacity exceeding 10 tonnes per day. The permit date is not supplied; • Three Local Authority Pollution Prevention and Controls, the nearest of which is located approximately 95 m northwest of the site and relates to coating and recoating of rail vehicles. The permit is dated as September 1995 but has since been revoked; • Nine Contemporary Trade Directory Entries (active and inactive), the nearest of which is located approximately 50 m northwest of the site and relates to repairing & restoring of furniture (inactive). The nearest active entry is located approximately 130 m north of the site and relates to electronic engineers; • Two Commercial Services Points of Interest relating to vehicle cleaning and recycling located approximately 220 m and 250 m northwest; • Twelve Manufacturing and Production Points of Interest relating to tanks, works and industrial estates, the nearest of which is a tank located approximately 10 m northeast of the site; and • One Fuel Station Entry (Stoneham Esso Express) located approximately 150 m west, the entry is recorded as obsolete.
Sensitive Environmental Receptors	An area of Special Scientific Interest is listed on-site, however, is considered to relate to the River Itchen and surrounding land which is also classified as a Special Area of Conservation. The site is also located within a Nitrate Vulnerable Zone (NVZ) relating to eutrophic water (Hamble Estuary Eutrophic Nvz).

	Historic England Records (historicengland.org.uk) indicate that no areas of designated heritage interest are located on or adjacent to the site.
Unexploded Ordnance (UXO)	A review of Zetica online risk mapping for the area indicates that the site is located in a Moderate risk area, with Southampton Airport listed as a Luftwaffe target. A Detailed Explosive Ordnance Risk Assessment has been undertaken for the site by Impartial Assessments which concludes that Explosive Ordnance poses a Low to Moderate Risk to proposed ground investigation and the development.

3.2 Environmental Sensitivity

Given the above, the site is considered to be of a moderate environmental sensitivity given the presence of the SSSI to the southeast of the site associated with the River Itchen, the underlying Secondary A and Secondary Undifferentiated Aquifers at the site, lack of an SPZ or potable water abstraction point within 1 km.

3.3 Historic Planning Applications

A review of Eastleigh Borough Council planning portal indicates a number of applications associated with Southampton Airport including provision of car parking, signage installations and most recently the extension of the runway under application Ref. F/19/86707. A number of reports relating to contaminated land were submitted as part of the planning process. These are reviewed in Section 5.0.

3.4 Regulatory Enquiries

The Contaminated Land Officer (CLO) was contacted to enquire into information on the site and immediate surrounding area as well as enquiring into whether the site is on their list for inspection on the basis of the historical use of the site. The response confirms that the site nor any property / land adjoining has been classified as Contaminated Land under Part 2A. The response is included in Appendix E.

4.0 Site History

Details regarding the development of the site, its immediate surroundings and potentially contaminative land uses were obtained from a review of historical maps.

Copies of the maps are provided in Appendix C and a detailed summary provided below and on the following page. All distances given are approximate and are relative to the site, unless otherwise stated.

From the earliest map edition dated 1871 the majority of the site comprised undeveloped agricultural land. North Stoneham Farm comprising numerous buildings was mapped in the southern corner of the site. A railway line was also present along the northeastern boundary. Allotment gardens were mapped in the northwestern corner from 1896. By 1909 two gravel pits were labelled, one in the northwest of the site adjacent to the allotment gardens and the other adjacent to the farm in the south. By 1911, a railway line was also mapped along the northwestern boundary and dissected through the northern area of the site in an east-west orientation. Filter tanks were labelled to the south of the railway in the eastern area of the site, with the railway line noted to be on a raised embankment. Further development of the railway was noted in the 1931 map edition in the form of a spur in the northeast. Further allotment gardens were shown in the central northern area adjacent to the railway embankment from the 1951 to 1968 map editions. The railway line was also noted to be disused by the 1963 map edition and the filter tanks were no longer present. By 1992, the gravel pit in the south of the site was noted to be disused and both the northeastern and southern gravel pits were no longer labelled by 1995, suggesting that they may have been infilled.

Development of North Stoneham Farm including a number of huts was shown in the 1931 map edition, aerial imagery dated 1947 and 1963. From readily available online information it is understood that the wider area has been in use as an airfield/airport since 1910, originally known as Eastleigh Airfield. The area was then used by the United States during WWI and by the RAF in WWII, with the area known as RAF Eastleigh, before becoming RAF Southampton, and later RNAS Eastleigh (HMS Raven) as a training ground for the Royal Navy. The buildings shown in the 1930-1960s mapping are considered to relate to the airfield use, likely huts/barracks for housing military personnel. The buildings were no longer shown by the 1963 map edition and the original buildings associated with North Stoneham Farm remained until their demolition in the early 1990s.

Airport infrastructure comprising approach lights in the northwest and a tower in the southeast of the site were shown in the 1991 and 1992 map editions. Modern development comprising present day car parks in the northwest were shown by the 1995 map edition and 2005 aerial imagery. No further significant changes were noted.

Within 250 m of the site, potential contaminative land uses include;

- Railway lines to the west and north from the earliest map edition dated 1871 until present. Further sidings, a rail yard and running shed were noted directly north by the 1911 map

edition with further development noted in the early 1930s and late 1960s. A series of tanks were noted approximately 30 m north of the site in the central northern area associated with the rail yard in the 1972 map edition;

- A sewage works located approximately 200 m north from 1887;
- A series of gravel and clay pits in the surrounding area to the northeast and northwest in early 1900s map editions;
- Allotment gardens to the north from 1909 until present and northwest from 1963 until no longer mapped in 1983; and
- Southampton Airport mapped from 1963 onwards with the runway noted within 250 m of the site in 1983 mapping.

5.0 Existing Reports

The following third-party report has been provided to Geo² by the Client for review:

- Southern Testing, Factual Ground Investigation Report, Southampton International Airport Runway Extension, (Ref. J14044), dated May 2020, Issue No. 7 *[this report relates to land adjacent to the northern area and the central northern area of the site]; and*
- Email correspondence from Dyer and Butler Ltd regarding groundwater monitoring results from January 2015 to September 2023.

In addition, the following third-party reports were identified associated with planning references F/19/86707;

- WSP, Geo-Environmental Preliminary Risk Assessment, Southampton Airport, Eastleigh, (Project No. 70048854), dated August 2019;
- WSP, Generic Quantitative Risk Assessment, Southampton Airport, Eastleigh, (Project No. 70048854), dated September 2019;
- Savills, Environmental Statement Chapter 12: Ground Conditions, Southampton International Airport Eastleigh, dated July 2020; and
- H Fraser Consulting, Phase II Land Quality Assessment for runway extension, Southampton Airport, (Ref. 30691R2), dated January 2023.

Further third-party reports are referenced within the WSP Preliminary Risk Assessment and Environmental Statement Chapter, however, these reports have not been made available to Geo² or identified on the planning portal. A review of the available third-party reports is provided for information purposes only.

5.1 Previous Report Review

WSP, Geo-Environmental Preliminary Risk Assessment, August 2019

WSP undertook a Preliminary Risk Assessment for Southampton Airport in 2019 to support a runway extension in the north. The red line boundary included the majority of the current target site with the exception of the northeastern field. Pertinent information related to the target site is included below.

Fuel storage for the airport was largely stored along the western site boundary and historically comprised a number of underground storage tanks (now removed) in the southern area of the western boundary.

As part of the report WSP contacted the Environment Agency (EA) for information relating to remedial works undertaken on/adjacent to the site. The response indicated that the EA did not hold any records of remediation, however, did have documents relating to contamination associated

with the rail depot ('Eastleigh Depot') located directly north of the site. The information indicated that oil contamination had been known to be present at the depot since 1998 with a further recorded leak in 2001 from the main fuel line. On-going monitoring was undertaken in 2003-2005, 2008 and 2015. Soil and groundwater contamination was identified c. 3.00 m bgl associated with the groundwater table in the River Terrace Deposit gravels. Correspondence also proposed that the hydrocarbons were potentially preferentially travelling along the high-pressure gas main route which was stated to be present along the northern boundary (separating the airport from the depot). Remedial works were planned for early 2018.

Further information provided by the EA included records of pollution incidents on-site including firefighting run-off (minor impact to land and water) in 2002, oil/fuel spillage (significant impact to land) in 2007 and oil/fuel containment and control failure (significant impact to land) in 2017. Details of a prohibition notice dated 1997 relating to de-icing run off was also provided. It was indicated that drainage of the run-off was diverted into foul drainage to prevent contamination of the underlying groundwater which was understood to be in continuity with the River Itchen. Following four months of monitoring, no impact/marginal deterioration of the groundwater downstream was noted.

Further third-party reports included an assessment of a bund in the northwestern corner which required removal prior to the car park development. Anecdotal evidence suggested that the mound comprised soil from the terminal construction. Chemical analysis indicated that the material was classified as 'inert'.

The report summarised a low to moderate risk to human health associated with the extension and a moderate to high risk to controlled waters related to the off-site hydrocarbon contamination. Ground investigation was recommended.

WSP Generic Quantitative Risk Assessment, September 2019 and Southern Testing, Factual Ground Investigation Report, May 2020

WSP undertook a Generic Quantitative Risk Assessment utilising initial data from the Southern Testing Ground Investigation (dated June 2019 at the time of the report preparation).

The ground investigation works comprised the advancement of 8 No. trial pits, 3 No. BRE365 tests and 2 No. cable percussion boreholes. The works were undertaken airside to the north and east of the runway (not within the current site boundary).

The ground conditions comprised a limited thickness of topsoil followed by firm to stiff silty sandy clay, becoming gravelly with depth to c. 1.90 m bgl, followed by medium dense gravelly sand/sandy gravel to c. 3.70 m bgl and fissured sandy silty clay of the London Clay Formation at depth. Groundwater was struck at depth in the London Clay within the boreholes, with standing water recorded at c. 4-5 m bgl at the start of each shift. Return groundwater monitoring over the following year recorded groundwater at depths of between 3.47 m bgl and 4.24 m bgl (10.26 m AOD to 9.49 m AOD). No visual or olfactory evidence of contamination was identified during the investigation.

Following soil chemical analysis none of the potential contaminants were identified above the applied commercial and public open space end use assessment criteria. Asbestos was not identified within the samples analysed. A single leachate sample identified potentially elevated copper concentrations above the applied EQS (inland surface waters), however, the one groundwater sample tested did not exceed the guidance values.

The report recommended further detailed review of information relating to the off-site fuel spills as it was unclear as of September 2019 whether physical remediation had been undertaken to address the pollutant linkage.

Savills, Environmental Statement Chapter 12: Ground Conditions, July 2020

The Environmental Statement used the previous WSP reports to provide the baseline conditions for the site to assess the impacts and effects from the development. Given that significant contamination was not identified during the ground investigation and the proposed development comprised a runway extension only, the potential impacts to ground conditions were considered to be negligible with consideration to the embedded mitigation measures as part of current best practice.

H Fraser Consulting, Phase II Land Quality Assessment for runway extension, January 2023

H Fraser Consulting undertook a further ground investigation along the northern runway area (predominantly outside of the current site boundary) in 2022 to support the planning application for the development. The ground investigation comprised the advancement of 10 No. shallow boreholes to depths between 3-4 m bgl and 9 No. shallow hand dug pits to a maximum depth of 1 m bgl.

The ground conditions generally composed a limited thickness of topsoil followed by sandy gravelly clay and gravel at depth. Groundwater was identified during drilling between 3.00-3.50 m bgl. However, the wells were all noted to be dry upon return monitoring. A strong hydrocarbon odour was noted in the northeastern area (BH208) between 2.70 m bgl and 3.00 m bgl.

Following soil chemical analysis none of the potential contaminants were identified above the applied commercial guidance values. Elevated concentrations of hydrocarbons were identified in BH208 at 2.70 m bgl, but not at a shallower depth in the same location, indicating lateral migration of contamination, consistent with the known off-site hydrocarbons from the rail depot.

Elevated concentrations of ground gas were not identified during return monitoring and low/negligible flow rates were recorded.

Given the elevated hydrocarbon concentrations in BH208, a watching brief was recommended at the time of the soakaway installation.

Groundwater Monitoring Results January 2015 to September 2023

The Client has provided monitoring data for the central northern area of the site, undertaken by Ricardo Energy and Environment from January 2015 to September 2023. There is limited information available, however, the boreholes are understood to be in use for the monitoring of hydrocarbon contamination known to be migrating from the adjacent rail yard. No information has been provided by the Client to indicate whether remedial works initially planned for 2018 have been undertaken. Most recent monitoring results from March and September 2023 indicate the presence of free product (up to 15 mm in thickness in borehole F2 close to the northwestern corner of the northeastern field) and elevated Total TPH concentrations at a maximum of 1,244,385 µg/l in F2 from groundwater collected using disposable bailers. The locations of the boreholes and photographs of the groundwater sampled from these locations is shown below in Figure B:



Figure B: Image sent to the Client by Ricardo Energy and Environment

6.0 Preliminary Risk Assessment

6.1 Source – Pathway – Receptor

UK legislation and guidance on assessing potentially contaminated land recommends the use of a risk assessment process based on a review of source/pathway/receptor relationships for various environmental media. The first stage of any risk assessment is to identify, using the desk study data and site information, the presence and extent of any hazard at the site, theoretical or demonstrable.

A key component of the overall risk assessment process is identification of “significant contaminant linkages” between contaminants and receptors. This can be accomplished through development of a site-specific conceptual model in which the potential contaminants, pathways and receptors identified on-site are described.

Each element can be defined as follows:

- **Contaminant source:** A substance either on or under the land and which has the potential to cause harm or pollution to human or environmental receptors.
- **Pathway:** A route or means by which a receptor can be exposed to or affected by a source.
- **Receptor:** A living organism or an ecological system, or controlled water, or property including buildings, crops and livestock.

The presence of all three of the above elements identifies a contamination linkage and a potentially unacceptable risk. To ensure that any risk present to, or, from the site can be appropriately managed each of these contamination linkages will be targeted by the investigation.

6.2 Hazard Identification

6.2.1 Potential On-Site Sources

Potential sources of on-site contamination have been identified associated with historical mineral extraction and subsequent landfilling in the northwest, the historical farm and mineral extraction in the south of the site (with possible infilling of the gravel pit). RAF/military use of the southern area of the site, railway embankment and filter tanks in the central area and development of airport infrastructure including car parks, radar towers and blast screens.

Information from the EA included within a previous WSP report for the site indicated that the following pollution incidents historically occurred on site: firefighting run-off (minor impact to land and water) in 2002, oil/fuel spillage (significant impact to land) in 2007 and oil/fuel containment and control failure (significant impact to land) in 2017. It was also noted that a prohibition notice was issued in 1997 relating to de-icing run off.

Due to the age of the historical buildings on site in the southern area, it is likely that asbestos materials were used in the construction of the buildings, leading to a potential for asbestos in shallow Made Ground soils.

Potential contaminants of concern include metals, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), poly- and perfluoroalkyl substances (PFAS) (associated with fire-fighting run-off), asbestos and ground gas.

6.2.2 Potential Off-Site Sources

Potential sources of contamination have been identified associated with the rail yard to the north and the wider airport. Hydrocarbon contamination (including free phase product) is known to be migrating onto site from the rail yard. Potential contaminants of concern include metals, petroleum hydrocarbons and polycyclic aromatic hydrocarbons.

A potential contaminant of concern commonly associated with sites where aircraft operate are Poly- and perfluoroalkyl substances (PFAS), associated mainly with Aqueous Film Forming Foam (AFFFs) used as a method of fire suppression for hydrocarbon fuelled fires (e.g. petrol, diesel and kerosene). PFAS have been commercially available since 1949, and a component of AFFFs since 1963.

6.3 Initial Conceptual Site Model

Contamination linkages arise as a result of the interconnection of the contaminant source, contamination pathways and potential receptors. These contamination linkages are used to design the site investigation (if required), guiding the type of investigation, location of exploratory boreholes and the required sample analysis.

6.4 Risk Estimation

The objective of the qualitative risk assessment is to determine the significance of the risk, if any, which may occur as a result of the creation of pollutant linkages, which connect a potential receptor to an identified potential contaminant source at the site.

The perceived risk is based on a consideration of both the likelihood of an event (probability) occurring, and the severity of the potential consequence. Classification of these two factors is detailed in Appendix D.

6.5 Qualitative Risk Assessment

A qualitative risk assessment is undertaken, detailed in the table on the following page, in line with guidance provided in CIRIA's Contaminated Land Risk Assessment: a guide to good practice CIRIA C552, 2001. The purpose of this assessment is to determine the relative significance of the identified contamination linkages by assessing the probability of an impact occurring and by assessing the perceived severity of an impact to a receptor.

Those linkages considered of low risk or less on the basis of the available site data will not be considered any further in this assessment. Linkages considered to be more significant are identified as presenting potentially unacceptable risk to the identified receptor. In these instances, further works may be considered necessary.

Source(s)	Pathway(s)	Receptor(s)	Comments	Risk	Requires Investigation
Potentially contaminated soils and/or groundwater located beneath the site.	Direct contact/ingestion and, inhalation of dust and vapours	Future site users, principally within landscaped areas. (human health)	Potential sources of contamination have been identified associated with the historical development of the site, mainly in the northern and southern areas. The historical use represents the potential for Made Ground/infill materials to exist, as well as localised impact, for example, following the spillage of fuel and the potential for PFAS to be present associated with firefighting run-off. Hydrocarbon contamination (including free phase product) is known to be present within the groundwater in the northern central area. There is also potential for ACMs to be present within shallow soils in previously developed areas.	Moderate / Low (Low Likelihood x Medium)	Yes
		Maintenance and construction workers. (human health)	Given the proposed commercial use, the majority of the site is likely to be covered in hardstanding and buildings, limiting the potential pathway, as such the risk to future site users is considered to be low. The risk in any proposed landscaped areas where Made Ground is present is considered to be moderate. The presence of hydrocarbons within the groundwater in the central northern area of the site may represent a vapour risk if buildings are proposed in this area. Site workers may become exposed to localised contaminated soils and shallow groundwater during intrusive groundworks undertaken at the site. Safe working practices should be undertaken and appropriate Personal Protective Equipment (PPE) should be used to reduce the risk to low. Intrusive investigation will be required to quantify the potential contamination risks.		

Source(s)	Pathway(s)	Receptor(s)	Comments	Risk	Requires Investigation
	Leaching to groundwater, lateral and vertical flow, followed by migration within the aquifer.	Underlying Secondary Undifferentiated Aquifer (River Terrace Deposits) and Secondary A Aquifers (Wittering Formation and Alluvium [if present]). The River Itchen and associated tributaries to the east. (controlled waters)	Potential sources of contamination have been identified associated with the historical development in the north and south of the site. Given the anticipated granular River Terrace Deposits, at this stage it is considered that the groundwater is likely in conductivity with the River Itchen to the east, as such the risk to controlled waters from on-site sources is considered to be low to moderate. An environmental investigation will be required to assess the soil quality beneath the site and the risk to controlled waters to include groundwater sampling and surface water sampling (where possible).	Moderate / Low (Low Likelihood x Medium)	Yes
Organic contamination in soils and groundwater	Direct infiltration in water supply pipes	Drinking water supply pipes	Hydrocarbons, especially aromatics, are known to permeate plastic pipes. Assessment of the risk to water pipes for any new supply will have to be undertaken as a requirement of the statutory undertakers, who should provide recommendations for upgrading of potable water supply pipes. It is considered that the use of upgraded water supply pipes may be required in previously developed areas and in the central northern area of the site where hydrocarbon contamination is known to be present within the groundwater.	Moderate (Likely x Medium)	Yes

Source(s)	Pathway(s)	Receptor(s)	Comments	Risk	Requires Investigation
Ground gas, including Radon	Vertical and lateral migration of ground gases	Current and proposed commercial site end users (human health)	Potential sources of ground gas have been identified at the site associated with Made Ground materials associated with historical development/demolition and landfilled/infilled gravel pits in the northwest and south of the site. However, given the time elapsed since landfilling/infilling activities (circa 30 years), it is considered that any gassing is likely to have ceased by now and the risk is considered to be low. However, there is potential for peat/organic material to be present associated with any Alluvial deposits in the east of the site, therefore the risk is considered to be moderate/low. A ground gas risk assessment is recommended to assess the characteristic situation for the site and requirement for any ground gas protection measures within new buildings. The site is in a low (less than 1% of homes are estimated to be at or above the Action Level) to intermediate probability radon area (up to 3 to 5% of homes are estimated to be at or above the Action Level). Given the site is located within two probability areas, it is recommended that the requirement for radon protective measures is confirmed with the Local Authority / Building Control. At this stage it would be prudent to allow for basic radon protective measures within new buildings.	Moderate / Low (Low Likelihood x Medium)	Yes

Source(s)	Pathway(s)	Receptor(s)	Comments	Risk	Requires Investigation
Potentially contaminated soil and groundwater from off-site sources	Migration of contaminants	Current and proposed commercial site end users (human health) Maintenance and construction workers. (human health) Groundwater beneath site. (controlled waters)	Potential off-site sources of contamination have been identified associated with the rail yard to the north of the site which is known to have impacted the groundwater in the northern central area with hydrocarbons (including free phase product). It is unknown whether remediation works have been completed, however, free phase product was most recently identified in September 2023. The wider airport also represents a potential source of off-site contamination; however, it is understood that the majority of the refuelling infrastructure is located along the western boundary of the airport. An environmental investigation will be required to assess the groundwater quality beneath the site and the risk to future site users and controlled waters.	Moderate to High	Yes

7.0 Geotechnical Constraints

7.1 Preliminary Ground Model

Based on the available information, it is anticipated that the ground conditions at the site will comprise Made Ground (in previously developed areas) or topsoil across the majority of the site. Significant thicknesses of Made Ground have not been identified during previous third-party investigations on site and adjacent to the northeastern area, however, investigation will be required to confirm the depth of Made Ground. The underlying natural deposits are likely to comprise an initial layer of clay followed by sand and gravel and then cohesive weathered bedrock of the London Clay Formation or Wittering Formation in the east. Bedrock is anticipated at c. 4.00 m bgl. Alluvium may be present in the east given the proximity to the River Itchen.

7.2 Geotechnical Considerations

The geotechnical constraints that are considered to potentially be a risk during redevelopment are detailed below:

- Made Ground – given the historical presence of buildings in the south of the site and their subsequent demolition, and landfilling/infilling of gravel pits in the northwest and south of the site, Made Ground may be present in areas of the site. Made Ground is typically variable in nature and strength with a potentially low bearing capacity and unacceptable levels of total/differential settlement may occur;
- Remnant structures – partially demolished buildings were noted in the southern area of the site. A scheme of demolition will likely be required to remove remnant structures;
- Quarrying – Two former pits are noted on historical mapping in the northwest and southeastern corners of the site. The northwestern pit is recorded to have been landfilled. It is unclear whether the southern pit has been infilled. Fill materials are typically variable in nature and strength with a potentially low bearing capacity and unacceptable levels of total/differential settlement may occur;
- Peat – Peat has been identified in an off-site BGS borehole in close proximity to the site. There is potential for peat to be present within any Alluvial deposits in the east of the site. Peat is highly compressible and unacceptable levels of total/differential settlement may occur;
- Cohesive soils – There is potential for cohesive soils to be present beneath the site associated with the superficial deposits and bedrock. Cohesive soils can change volume, creating “shrink/swell” problems on the site. Cohesive soils are also generally unsuitable for traditional soakaways to be constructed; and
- Utilities – Several third-party utilities have been identified on-site including a high pressure gas main, electric, telecoms and sewerage.

8.0 Conclusions and Recommendations

8.1 Conclusions

A Preliminary Risk Assessment of the site known as Navigator Quarter, Southampton, located at Mitchell Way, SO50 5QJ was undertaken, prior to proposed redevelopment of the site for commercial end use.

8.1.1 Contaminated Land Considerations

The purpose of the assessment was to evaluate the potential for risk to be posed to human health and controlled waters from historical and current use of the site.

The site has a long history associated with aircraft use, from Eastleigh Airfield in the early 1900s to forming part of Southampton International Airport. Surrounding land uses include a rail yard to the north, Southampton Airport (runway, terminals and commercial premises) to the west and the River Itchen SSSI and conservation area to the east.

Due to the historical use of the site and wider area and potential sources identified, Geo² considers the risk to site end users from contaminants within shallow soils and the risk from elevated ground gas concentrations to be **Low to Moderate**.

Significant on-site sources of contamination have not been identified, however, the site is in close proximity to the River Itchen, a sensitive water receptor, as such, the risk to controlled waters is considered to be **Low to Moderate**. The off-site rail yard to the north is known to have impacted groundwater with hydrocarbons (including free phase product) in the northern central area of the site. It is unknown whether remediation works have been completed, however, free phase product was most recently identified in September 2023. As such the risk from off-site sources is considered **Moderate to High**.

8.1.2 Geotechnical Considerations

The key geotechnical considerations of the site relate to the potential Made Ground associated with historical development and infilling of two gravel pits in the northwestern and southeastern corners. The northwestern pit is indicated to have been landfilled. Remnant structures may also be present associated with development in the south and a series of utilities including high pressure gas main are on-site. There is also potential for peat and cohesive soils to be present beneath the site. Peat is highly compressible, and cohesive soils can change volume, creating “shrink/swell” problems on the site. Cohesive soils are also generally unsuitable for traditional soakaways to be constructed. This risk should be further assessed through intrusive ground investigation.

8.2 Recommendations

The following measures are recommended to address the identified risks and to assist in satisfying anticipated contaminated land planning conditions:

- Further enquiries should be made as to whether physical remedial works were undertaken on the rail yard to the north;
- Based on the identified potential sources and risk assessment an intrusive investigation is required to confirm the potential contaminant linkages. Data collected from such investigation will enable a review of the soil, groundwater and ground gas risks, refinement of the ground model, and further review of identified potential contaminant linkages;
- Given the site is located within two radon probability areas (low and intermediate), it is recommended that the requirement for radon protective measures is confirmed with the Local Authority / Building Control; and
- Subject to the findings of the intrusive investigation, a Remediation Strategy may be required for the redevelopment of the site.

9.0 Report Limitations

This Report was prepared by Geo² for the sole and exclusive use of the Client and for the specific purpose for which Geo² was instructed. Unless explicitly agreed otherwise, in writing, this Report has been prepared under Geo²'s Standard Terms and Conditions.

Geo² does not intend, without its written consent through a formal letter of reliance or warranty, for this Report to be disseminated to any party other than the named Client or to be used or relied upon by any party other than the named Client. Use of the Report by any other party is unauthorised and such use is at the sole risk of the user. Any party using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Geo² from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by Geo².

The recommendations contained within this Report represent Geo²'s professional opinions, based upon the information detailed within the Report, exercising the reasonable skill and care to be expected of a professional consultant holding itself out as having the competence, experience, and resources necessary for the purpose of carrying out similar work in scope and character to the services performed. The Report needs to be considered in the light of the proposal and associated limitations of scope. The Report needs to be read and considered in full and isolated sections cannot be used without full reference to other elements of the Report and any previous works referenced within the Report.

10.0 References

British Standards Institute

BS10175:2011 “Investigation of potentially contaminated land sites – code of practice”

British Geological Society

Geology of Britain Viewer

CIRIA

C552 Contaminated Land Risk Assessment, a guide to good practise, 2001.

C665, Assessing risks posed by hazardous ground gases to buildings, 2007.

CL:AIRE

Good Practice For Risk Assessment For Coal Mine Gas Emissions, October 2021.

Environmental Agency

Land Contamination Risk Management (LCRM) Guidance, 2020

Landmark

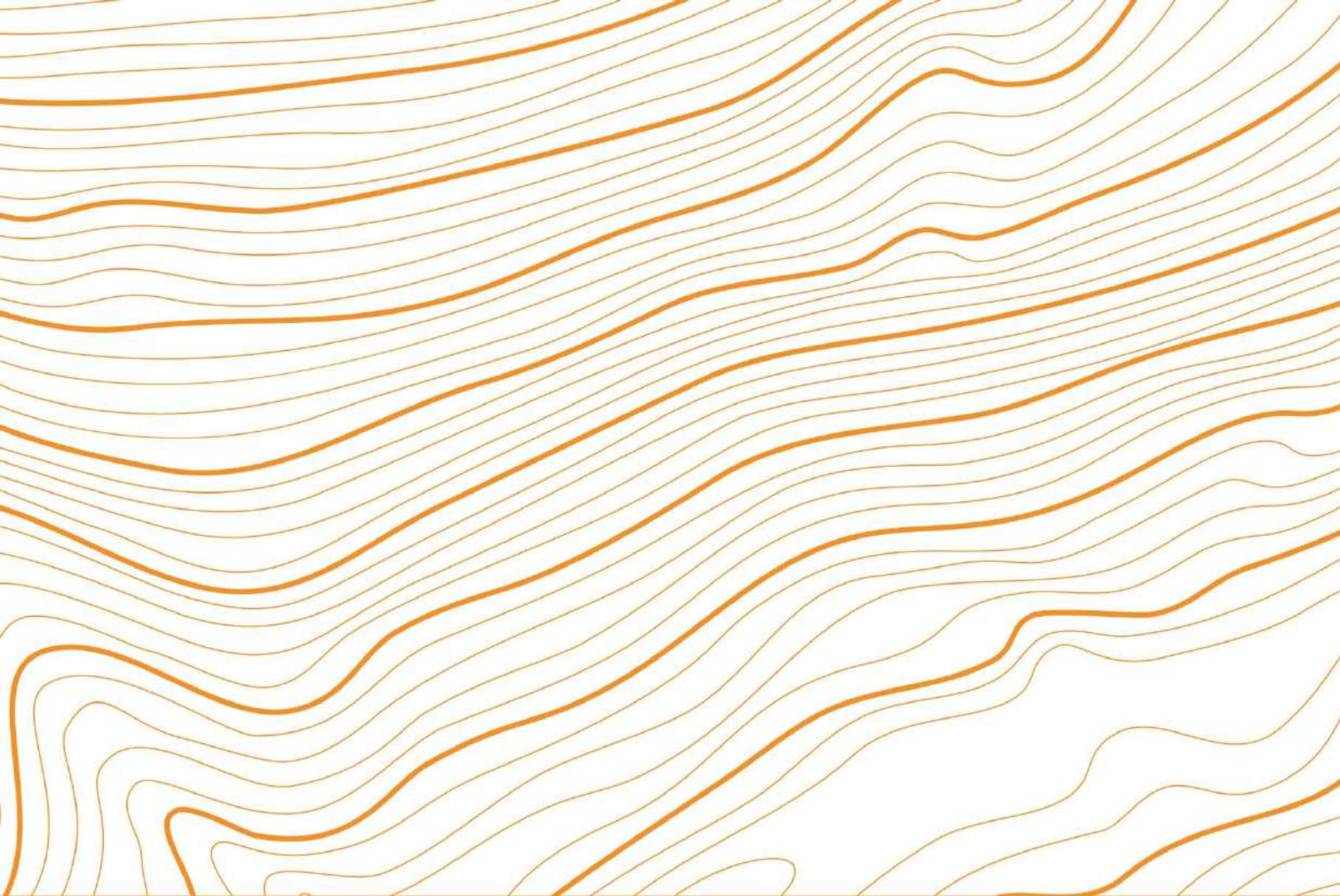
Envirocheck Report, ref. 366723883_1_1, dated January 2025

The Coal Authority

Coal Authority Interactive Viewer

Zetica UXO

Risk Maps Viewer



Appendix A – Figures

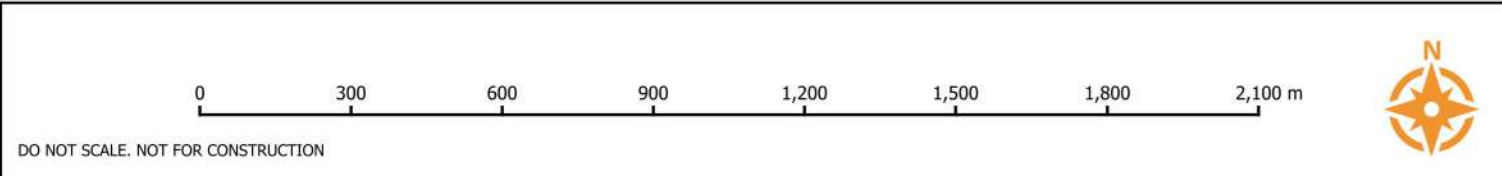
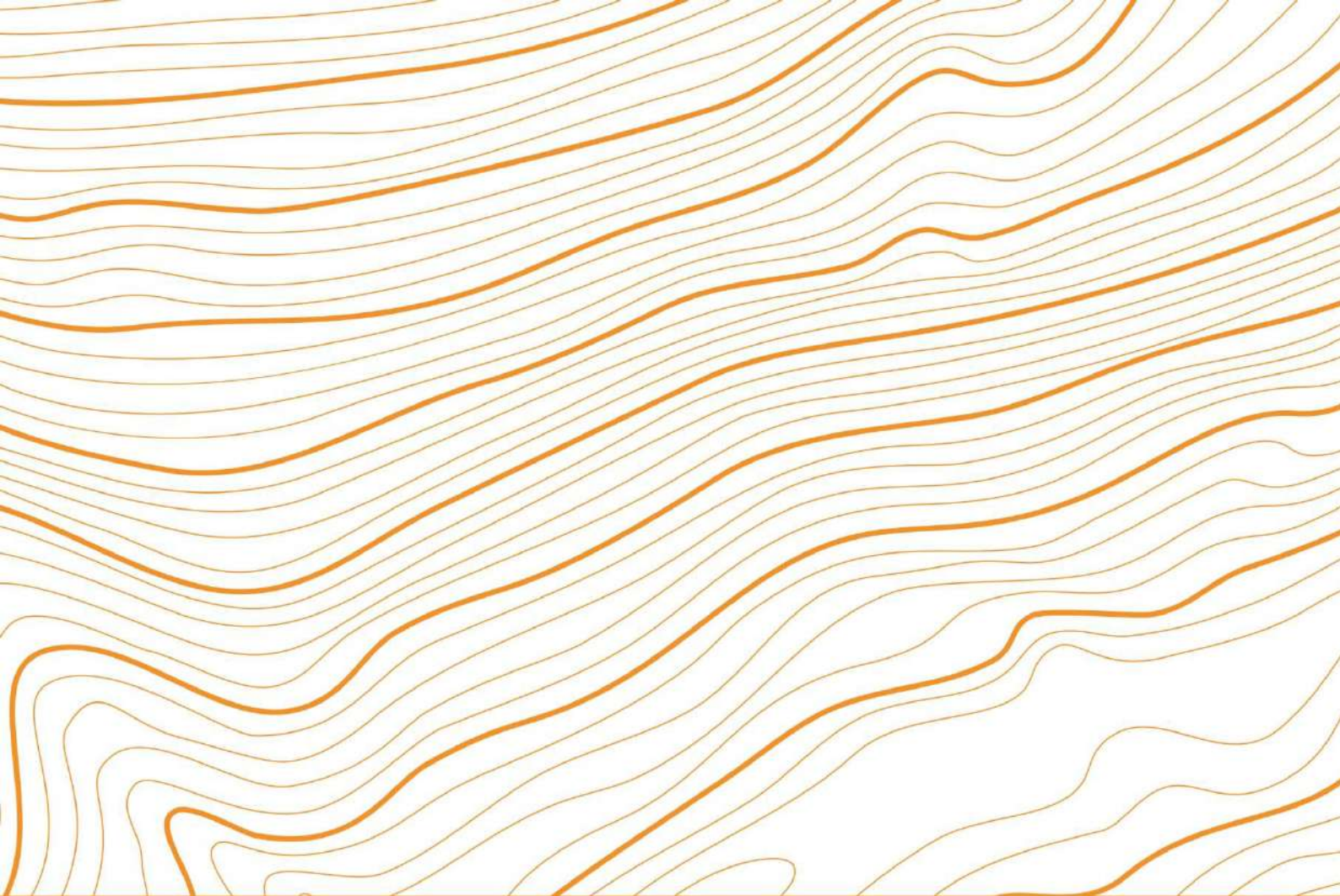


Figure Site Location Plan		
Job Navigator Quarter, Southampton		
Client Blocwork (Eastleigh) LLP and AGS Airports Group Limited		
Figure No. 1	Revision 1	Date 07 February 2025
Drawn by JCR	Checked by TH	Scale 1:15,000
Job No. 4362		



Appendix B – Photographic Survey

4362 – Navigation Quarter – Photographic Survey 1

Image 1: Access along northeastern boundary



Image 2: View across northeastern field



Image 3: Former railway embankment, densely vegetated



Image 4: Remnant waste on former railway embankment



Image 5: View across eastern field



Image 6: High pressure gas main marker along northeastern boundary



4362 – Navigation Quarter – Photographic Survey 2

Image 7: View along northern boundary, off-site tank



Image 8: View east across fallow land



Image 9: Northern area of the site adjacent to runway



Image 10: Blast barriers in north



Image 11: View across fallow land in northwest



Image 12: Access into eastern fields



4362 – Navigation Quarter – Photographic Survey 3

Image 13: Material storage in disused car parking



Image 14: Car parking in west



Image 15: Mitchell Way



Image 16:Gravel disused car parking



Image 17:Access into long stay car park

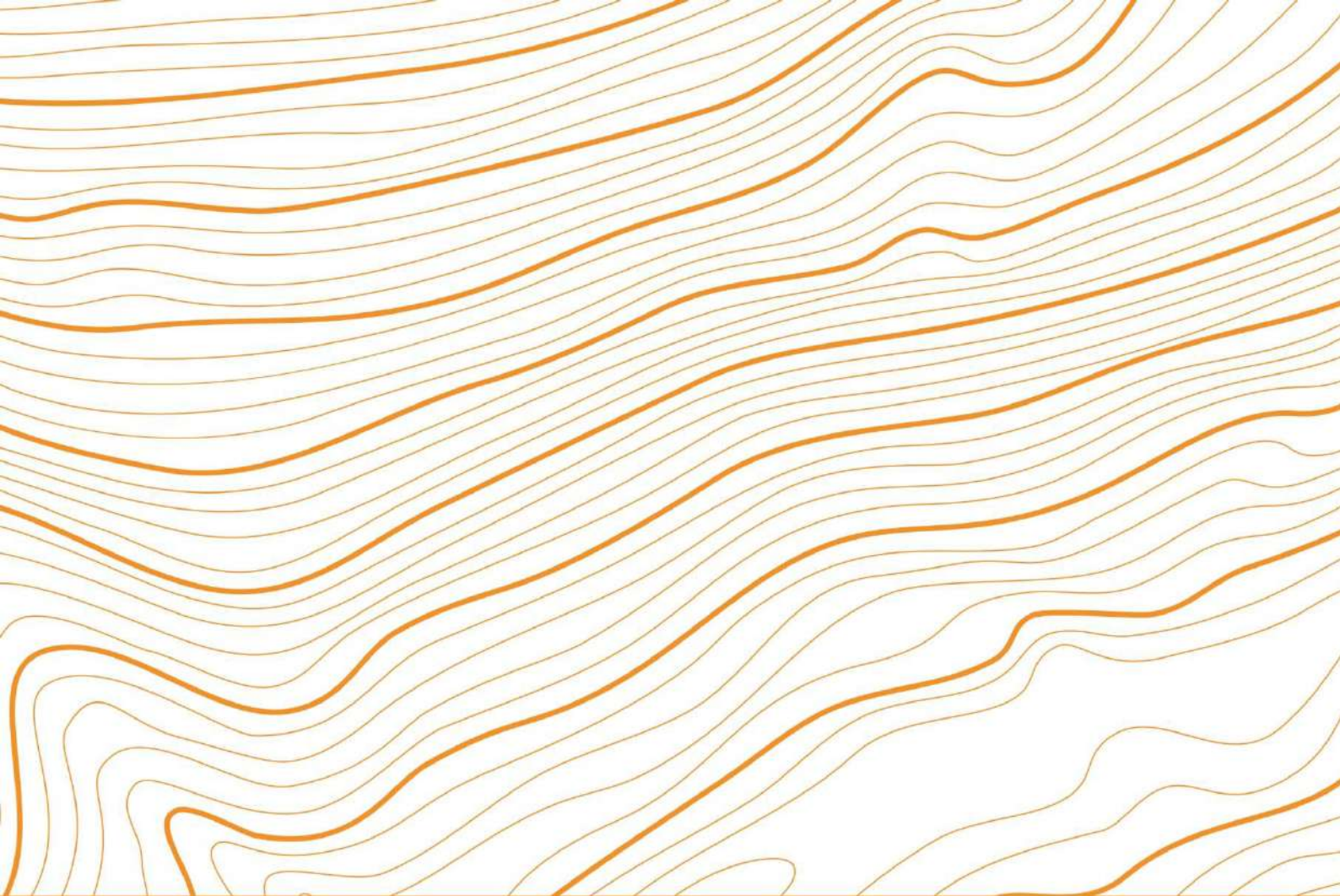


Image 18:Long stay car park



4362 – Navigation Quarter – Photographic Locations





Appendix C – Desk Study Data