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ENVIRONMENTAL SITE ASSESSMENT
PHASE I INVESTIGATION

EW BOWERS COACHES LIMITED
HAYFIELD ROAD
CHAPEL-EN-LE-FRITH
TOWNEND
SK23 0NU

REPORT PREPARED FOR

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1.0 INTRODUCTION

Peak Environmental Solutions Limited has been commissioned by Centrebus Limited to undertake a Phase I Environmental Site Assessment (contamination desk study) of Bowers Coaches, an ~0.1 hectare industrial operational bus depot site located at Hayfield Road, Chapel-en-le-Frith, Townend, LE4 9HR (centred on NGR 406190,380930). A site location plan is shown in Figure 1 and a topographic survey showing the site layout is reproduced in Figure 2.

This report has been written to support a forthcoming planning application to High Peak Borough Council (HPBC) for redevelopment of the site for residential landuse. The works undertaken as part of this Phase I report include a site walkover, interpretation of readily available environmental site information & historical mapping, development of a preliminary conceptual site model (CSM) and the completion of a qualitative land contamination preliminary risk assessment (PRA).

The purpose of the report is to:

1. Determine the potential for onsite or offsite land contamination issues arising from the current or historical uses of the site and surrounding area; and

2. Provide an initial assessment of potential risks that any such land contamination may pose to sensitive receptors on the redeveloped site, including future site users, controlled waters and infrastructure.

The report has been produced in accordance with the umbrella framework laid out in NHBC/EA Publication R&D66 (*'Guidance for the Safe Development of Housing on Land Affected by Contamination'*), BSI 10175:2011 *'Investigation of Potentially Contaminated Sites'* Code of Practice and DEFRA/EA CLR-11 '*Model Procedures for the Management of Land Contamination'* (referenced in Section 5.0) as well as in general accordance with the National Planning Policy Framework 2012.

The report was finalised in July2012 and should be read in the light of any subsequent changes in legislation, statutory requirements, statutory & non-statutory guidance, relevant research and industry practices, and should be read in conjunction with the documents detailed in Section 2.1. Additional references are provided in Section 5.0.

Information obtained by Peak Environmental Solutions has been relied upon by Peak Environmental Solutions in good faith. This Phase I Report is subject to the standard terms & conditions of Peak Environmental Solutions and the limitations & exceptions detailed in Appendix A.

2.0 SCOPE OF WORK

2.1 Desk Study and Site Walkover

The information considered as part of the Phase I desk study included a Landmark historical map pack (reproduced in Appendix B) and review of a variety of data sources including geological maps and Environment Agency (EA) data. Where appropriate, third party information has been referenced in the report or reproduced in the Appendices, with additional references listed in Section 5.0.

A site walkover was undertaken by Peak Environmental Solutions on the 5th July 2012 to assess the site environmental setting, review the site layout and check for visual evidence of contamination sources. The walkover survey did not include an assessment of asbestos containing materials (ACM) or an assessment of invasive weeds such as Japanese knotweed, Himalayan balsam or Giant hogweed. An overview of the site walkover observations are presented in Figure 3 and photographs are presented in Appendix C.

The report includes a preliminary assessment for the potential for radon gas hazards. A detailed radon assessment falls outside of the scope of the report and the requirement for radon mitigation measures in the proposed development should be identified separately to the satisfaction of HPBC Building Control.

2.2 Preliminary Risk Assessment

The qualitative PRA presented in this report considers the proposed residential redeveloped landuse and includes development of a conceptual site model (CSM) to assess the significance of risks associated with relevant pollutant linkages (RPLs) identified by a source-pathway-receptor analysis. The assessment of risk is based on a consideration of the following:

- The probability of an event occurring, taking into account both the presence of the hazard and receptor and the plausibility of the pathway (where probability is defined as the chance of a particular event occurring in a given period of time); and
- The severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the receptor (where severity or consequence can be defined as the adverse effects (or harm) arising from a defined hazard, which impairs the quality of human health or the environment in the short or longer term).

The PRA uses the risk matrix, consequence, likelihood and R&D 66 risk classification scheme (Very Low to Very High) detailed in Appendix D. For the purposes of the qualitative assessment, identified Very Low to Low risks will be considered acceptable for the redeveloped site uses.

2.3 Conclusions and Recommendations

The report presents the conclusions drawn from the Phase I study & risk assessment and makes recommendations for any further work likely to be necessary to support the proposed planning application

3.0 REPORTING

The findings of the Phase I are presented in tabular form as outlined in Table 1.

Table 1: Report Overview

Tables & Sections	Aspect covered
Table 2: Site Description & Environmental Setting Table 3: Site Walkover Observations and Comments Table 4: Geology Table 5: Hydrogeology and Hydrology	Site Location & Description Contemporary Site Activities Contemporary Neighbouring Landuse Geology Hydrogeology Hydrology Environmentally Sensitive Areas
Table 6: Permitted Operations & Pollution Incidents Table 7: Historical & Contemporary Landuse	Pollution Incidents Permitted Operations Historical Site Landuse Historical Off-Site Landuse Contemporary Site Landuse Contemporary Off-Site Landuse
Table 8: Substances of Concern	Likely contaminants based upon history of site and neighbouring land
Table 9: Initial Conceptual Site Model & Preliminary Risk Assessment	Relevant Pollutant Linkage Assessment Preliminary Risk Assessment
Section 4.0	Conceptual Model Uncertainties Principal Contamination Issues Conclusions and Recommendations

Table 2: Site Description & Environmental Setting

Aspect	Comments	Sensitivity
Site Location	- The site is located near the centre of Chapel-en-le-Frith in Derbyshire, approximately 7.5 km north of Buxton, at NGR 406190, 380930. - Access to the site is from Hayfield Road to the east of the site. A site location plan is presented in Figure 1.	Not applicable
General Site Description and Contemporary Site Activities	- The ~0.1 hectare site has an irregular boundary shape and a relatively flat topography ranging from 220.7m Above Ordnance Datum (m AOD) in the southeastern extent to 220.1m AOD at the northwestern extent. A topographic survey plan is presented in Figure 2. - Surface cover predominantly comprises three main buildings/structures in the northern, central and eastern site areas and associated hardstanding. Observations regarding on-site structures made during the site walkover are presented in Table 3. Photographs taken during the site walkover are presented in Appendix C. - The northern structure (designated 'S1' in Figure 3) comprises an open-fronted breezeblock-built garage building, within which two adjoining single-storey breezeblock storage rooms have been constructed. Two vehicle-servicing pits lie within the footprint of the main structure. - The central structure (designated 'S2') comprises a two-storey stone-built workshop & office building with pitched slate roof. - The eastern structure (designated 'S3') comprises a two-storey stone-built canteen & storage building with pitched slate roof. - Disused below ground diesel storage tanks are present in the western site area. - Disused above ground diesel, kerosene & used oil storage tanks are present in the southwestern site area. - An active above ground diesel storage tank & dispenser are present in the south-central site area. - Services known to exist on-site comprise electricity, gas, telecommunications and sewerage. - The site has been in use since the mid 1950s as a transport depot, details of which are presented in Table 7. - The principal current on-site activities comprise vehicle refuelling and provision of staff welfare facilities. On-site vehicle maintenance is no longer undertaken. - A commercial office building to the south of the proposed red line planning boundary and is used by Bowers Coaches for general administration. This area falls outside the scope of the Phase I.	Not applicable
Contemporary Neighbouring Landuse	- The site lies within a mixed commercial/industrial/residential setting. Adjacent land uses comprise: - North: Chapel Garage vehicle maintenance facility and residential properties of hayfield Road - East: Hayfield Road with residential properties beyond - South: Residential and small-scale commercial properties including offices used by Bowers Coaches and a dry cleaning business adjacent to Market Street (B5470). - West: Residential properties with the Shoulder of Mutton public house beyond.	**Moderate-High**

Aspect	Comments	Sensitivity
Environmentally sensitive Areas	- No protected environmentally sensitive areas have been identified within 1 km of the site. - The closest identified environmentally sensitive area is Lower Peaslows Farm Meadow, a designated Site of Special Scientific Interest (SSSI) located ~3 km to the east of the site.	**Low**
Proposed Site Use	- The current proposed redevelopment layout is presented in Figure 4 and includes the following: • Demolition of the northern site structure 'S1' and replacement with a new-build two-storey 3 bedroom dwelling 'Plot 3' • Conversion of the central site structure 'S2' to a two-storey 2/3 bedroom dwelling with annexed ground-floor living room 'Plot 2' • Conversion of the eastern site structure 'S3' to a 2 bedroom dwelling with annexed ground-floor dining room 'Plot 2' • Creation of associated hard/soft landscaping & vehicle parking areas including block paving & vegetated areas.	**High**

Table 3: Site Walkover Observations and Comments

The following observations relate to accessible areas and should be used with the figures & site photographs

- Figure 3 provides an overview of on-site features observed during the site walkover, an extract from which is presented for clarity. Selected photographs taken during the site walkover are presented in Appendix C.



Extract from Figure 2

- Three buildings are present within the site boundary, designated S1, S2 and S3 in Figure 2. Areas of interest have been given numerical references and are discussed below.

The following observations relate to accessible areas and should be used with the figures & site photographs
- Structure S1 comprises an open-fronted breezeblock-built garage building, within which two adjoining single-storey breezeblock storage rooms have been constructed. Two vehicle-servicing pits (Ref. 'C') lie within the footprint of the main structure. At the time of the site walkover, the vehicle servicing pits contained oily standing water; it is understood that water generally soaks away to ground from the pits during dry weather. A ~1,500 litre above-ground engine oil tank & associated hand pump is present in the northwest corner of S1 (Ref. 'A') along with full and empty barrels of metal cutting fluid, transmission fluid and buckets of oily water. The concrete flooring in this area is in average condition and is heavily hydrocarbon stained. Drums (nominal 200 litre capacity) of screen & vehicle wash concentrate are connected to an electronic dilution mixer at location Ref. 'B'; smaller oil drums are also present in this area. The concrete flooring in this area is in average condition and is hydrocarbon stained. Unused 200 litre drums of screen and vehicle wash concentrate are stored in the northeastern corner of structure S1 along with two end-of-life fuel dispenser units, vehicle and machinery parts (Ref. 'D').
- Structure S2 comprises a currently disused two-storey stone-built building, the northern half of which has historically been used as a workshop on the groundfloor and a spare parts store on the first floor. The structure has a concrete floor slab in average conditions with hydrocarbon staining; limited quantities of oil, paint and cutting fluid were also observed in the workshop area (Ref. 'I'). The southern half of the building was used as office space and tyre storage on the ground floor and storage of assorted packaging and general equipment on the first floor.
- Structure S3 comprises a two-storey stone-built building, the ground floor of which provides canteen and toilet facilities for site users. Access to the first floor is via a staircase inside the southeastern building extent. The small groundfloor hall area in this part of the building is used to store barrels of opened and unopened transmission oil, with the concrete floor in this area hydrocarbon stained (Ref. 'M'). The first floor of structure S3 is used for storage of oil barrels, vehicle parts, office equipment and paperwork.
- Manhole covers associated with disused direct fill underground fuel storage tanks were observed in the western site area (Ref. 'E'); anecdotal evidence suggests that usage of these tanks was ceased a few years ago following suspicions of a leak.
- Three ~2,500 litre disused above ground storage tanks in the southwestern site area are understood to have historically contained diesel, kerosene & used oil(Ref. 'L').
- An active above ground diesel storage tank was observed in the south-central site area measuring approximately 6m long by 2m wide and 2m high (Ref. 'K').
- Two diesel dispenser units (pumps) were observed in the north-central site area (Ref. 'F' and 'H'). These are understood to be linked to the active diesel tank via an underground fuel pipe (Ref. 'G') and an overground pipe between pump 'H' and tank 'K'. Hydrocarbon staining was observed on the concrete hardstanding beneath the pumps (Ref. 'F').
- The overground fuel pipe was between pump 'H' and tank 'K' is understood to have been installed following complaints relating to diesel odours within structure S2 attributed to the former below-ground diesel pipe in this area (Ref. 'J'). The disused former below ground fuel pipe remains on the surface in this area and was observed to be heavily corroded.

Table 4: Geology

Aspect	Comments	Sensitivity
Geology	- Information relating to the solid & drift geology of the area are shown on the British Geological Survey (BGS) 1:50,000 Geology Map Sheet 99 'Chapel-en-le-Frith & geological memoirs, along with supplementary on-line geological information. - Made ground deposits are likely to exist beneath the site due to its previously developed nature and likely presence of sub-base materials beneath hardstanding areas. - Geological mapping data indicates the presence of Superficial Devensian Till deposits comprising silts, sands and gravels underlying the site. Quaternary alluvial deposits comprising clay, silt, sand & gravel are indicated present to the west of the site adjacent to Warm Brook. - The solid geology beneath the site comprises the mudstones, siltstones and sandstones of the Carboniferous Millstone Grit Group. No outcropping faces were observed during the site walkover. - Based on Health Protection Agency (HPA)/BGS radon maps, the site appears to fall within an area with between 0 and 1% of homes above the action level. The requirement for radon protection measures within the redeveloped site should be determined by the client to the satisfaction of CEC Building Control.	**Moderate** - Naturally occurring metals in soils/superficial may have the potential to pose a natural source of contamination & hazards. - The presence of low permeability superficial deposits may afford some protection to deeper groundwater from surface contamination.

Table 5: Hydrogeology and Hydrology

Aspect	Comments	Sensitivity
Hydrogeology	- Environment Agency-defined Aquifer maps indicate that the Millstone Grit Group bedrock beneath the site comprises a 'Secondary A Aquifer'. The on-site indicated superficial till deposits are not indicated to have an aquifer classification and the off-site superficial alluvium deposits are designated a 'Secondary A Aquifer' - The depth to groundwater was not determined as part of this assessment. - The site is not within EA-defined Source Protection Zone (SPZ). The closest SPZ (Zone 1) is ~5 km to the southeast. - No British Geological Survey-recorded borehole records have been identified within 250m of the site. The closest such identified feature lies ~290m east of site and relates to the Black Brook Flood Alleviation Scheme (Ref. SK08SE187). A ~70m deep groundwater borehole is located ~350m northwest of the site at Ferodo Ltd, Chapel-en-le-Frith (Ref. SK08SE13).	**Moderate** - The bedrock geology is designated a 'Secondary A' aquifer.
Hydrology	- The closest identified surface water feature is Warm Brook, which lies ~100m west of the site. Black Brook lies ~150m east of the site and meets Warm Brook ~350m to the northwest of the site boundary. - No chemical river quality monitoring is known to be undertaken by the EA within 2 km of the site. The closest identified EA monitoring location is ~4.5 km northwest of the site at the River Goyt. - The EA website does not identify the site as lying within an area at risk of flooding from rivers or reservoirs.	**Low** - Closest identified surface water feature ~100m west of the site. Quality testing not undertaken by the EA.

Table 6: Permitted Operations & Pollution Incidents

Aspect	Comments	Sensitivity
Permitted Sites	- One Industrial Operator (OPRA) record has been identified within 1km of the site; relating to Federal Mogul Friction Products Limited, located at Hayfield Road, Chapel-en-le-Frith (Licence No. BS2968IF). Operator performance is listed as 'Very Good' and no notifiable releases are listed on the 2010 Industrial Pollution Licence.	**Low-Moderate**
Waste Operations & Landfills	- No records of contemporary or historic landfill sites or waste operations have been identified within 500m of the site. - The closest identified operation of this type is located ~550m north of the site named 'Land off the A6' in EA records and relates to historic household waste disposal. No Licence number or dates of operation are held on the EA website for this facility. - The next closest identified waste disposal site relates to Forge Bleach Works ~1.8 km northwest of the site which accepted inert wastes and was operational between December 1920 and March 1994. No Licence number is held on the EA website for this facility.	**Low** - The closest identified landuse is ~550m from the site as is unlikely to pose a significant risk to the proposed development
Pollution Incidents	- One recorded pollution incident has been identified within 500m of the site, relating to a 'Significant' impact to water from organic chemicals/products ~200m north of the site in June 2003 (Incident No. 163351).	**Low** - Single identified pollution incident recorded in 2003 >150m from the site

Table 7: Historical & Contemporary Landuse

Aspect	Comments	Sensitivity
On-Site Landuse	- Selected Envirocheck Historical Maps spanning the years 1879-2012 are presented in Appendix C. - 1879/80: No site-use annotation is given. The site lies within a mixed residential/agricultural/industrial setting. The southern site building 'S2' is shown in place, with additional smaller structures in the western site boundary area. The area of the site now occupied by the eastern site building 'S3' is shown to support a building ~3 times larger than the current structure, which runs southwest into the central site area. - 1898: An extension is shown to the northern elevation of the southern site building 'S2', a small structure is shown in the north-central site area. - 1921: Structure shown in northern site area occupying eastern half of current 'S1' structure. - 1938: Northern extension of southern site building 'S2' no longer shown. Structure shown in northern site area occupying footprint of current 'S1' structure. - 1969: Small annex shown to western elevation of eastern site building 'S3'. - 1978-1984: Eastern structure 'S3' shown to occupy current footprint. - 1988-1989: Eastern structure 'S3' shown to occupy current footprint. - 1974-1991: Eastern structure 'S3' shown to occupy current footprint. - 1993: Structure shown adjacent to western boundary in southwest site area. - 1993-11: No significant changes shown. - 2012: Structure formerly adjacent to western boundary in southwest site area no longer shown.	**Moderate-High** - Potentially contaminative historical on-site landuses have been identified on-site.
Anecdotal Information		
- Bowers coaches is understood to have been established in 1952, and it is assumed to have occupied the site since this date. This is supported by the relatively minor changes indicated to the site by the historical Ordnance Survey data - The use of the site prior to the establishment of Bowers Coaches in 1952 is unknown, however the size of the buildings & structures shown from 1879 onwards indicates an agricultural/industrial usage. - The structure shown adjacent to the western boundary in the southwest site area between 1993 and 2012 is understood to have been an open-fronted parking shed for employee vehicles.		

Aspect	Comments	Sensitivity
Off-Site Landuse	- Selected Envirocheck Historical Maps spanning the years 1879-2012 are presented in Appendix C. - 1879/80: Smithy shown ~50m southeast of site, burial ground shown ~100m south of site, Wadding Mill shown ~150m southwest of site, mill ponds shown ~150m north of site, brickworks & associated earthworks shown ~175m southwest of site, two smithys shown ~250m east of site, gas works shown ~225m northwest of site, New Hyde Mill (cotton spinning) shown ~250m northwest of site, Bowdenhay Mill (wadding) shown ~400m north of site. - 1898: Brick works & associated earthworks shown ~225m southeast of site. Smithy ~50m southeast of site no longer shown, Wadding Mill ~150m southwest of site expanded, brickworks ~175m southwest of site now shown as dye works, Bowdenhay Mill ~400m north of site expanded. - 1921 Brick works ~225m southeast of site no longer shown, gas works ~225m northwest of site expanded & annotated 'Chapel, Whaley & District Gas Co.', New Hyde Mill ~250m northwest of site expanded northwest & annotated 'Sovereign Mills', - 1938: Dye works ~175m southwest of site now shown as 'Smithbrook Mill', gas works ~225m northwest of site expanded although no longer annotated, Sovereign Mills ~250m northwest of site expanded, - 1969: Plant hire depot shown ~150m west of site, haulage depot/council yard shown ~175m east of site, engineering works shown ~250m east of site. Smithbrook Mill ~175m southwest of site now shown as Chapel Service Station, Wadding Mill ~150m southwest of site now shown as engineering works, gas works ~225m northwest of site no longer shown & replaced with small garage, Sovereign Mills ~250m northwest of site expanded, Bowdenhay Mill ~400m north of site no longer shown. - 1978-1984: Engineering works Mill ~150m southwest of site expanded. - 1988-1989: Engineering works Mill ~150m southwest of site expanded and annotated 'Works'. - 1974-1991: Engineering works Mill ~150m southwest of site expanded and annotated 'Works'. - 1993: No significant changes shown. - 1993-2000: No significant changes shown. - 2006: Sovereign Mills ~250m northwest of site reduced number of outbuildings, open land to the northwest of site developed for residential landuse. - 2012: No significant changes shown.	**Moderate** - Evidence of potentially contaminative adjacent off-site uses have been identified by the desk study, the closest of which lie within 150m of the site.

Table 8: Substances of Concern

Group	Substances	Comments
Inorganic Substances	- Metals: semi metals & non metals: arsenic, cadmium, total chromium, copper, lead, inorganic mercury, nickel, selenium, vanadium, zinc - Asbestos	- Potential inorganic substances of concern include metals and asbestos from previous on-site vehicle maintenance activities and asbestos from on-site building material/historical structure demolition.
Organic Substances	- Total petroleum hydrocarbons (TPH): aliphatic & aromatic fractions C5-C44. - Priority 16 polyaromatic hydrocarbons (PAH): naphthalene, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo-a-anthracene, chrysene, benzo-b-fluoranthene, benzo-k-fluoranthene, benzo-a-pyrene (BaP), dibenzo-a,h-anthracene, benzo-g,h,i-perylene, indeno-1,2,3-c,d-pyrene. - Volatile and Semi-Volatile Organic Compounds - Chlorinated & non-chlorinated Solvents - Detergents	- TPH & PAHs contaminants may be present in shallow soils and groundwater across the site due previous and contemporary site landuse, including above ground fuel and oil/lubricant storage, vehicle maintenance and vehicle storage. - TPH & PAHs contaminants may be present in deeper soils and groundwater in the northwestern and western site areas due to the presence of below ground vehicle inspection bays, fuel storage tanks and vehicle fuelling facilities in these areas. TPH/PAH impacted deeper soils & groundwater may also exist in the south-central site area due to the historical presence of a potentially compromised underground fuel pipe in this area. - A range of VOCs & SVOCs including chlorinated solvents may be present in soils & groundwater beneath the northern 'S1' and central 'S2' site buildings due to the historical & contemporary storage of vehicle maintenance products and vehicle maintenance undertaken in these areas. - Detergents may be present in made ground, site soils and groundwater from vehicle washing processes.
Ground Gases	- Ground gases : methane & carbon dioxide - VOC vapours (includes hydrocarbon/organic vapours) - Radon	- Potential ground gas generating materials may exist beneath the site due to historical site landuses and potential historical spillages/leakage. - The potential for naturally elevated radon levels has not been considered in detail as part of this assessment and the requirement for radon protection measures within the development should be determined to the satisfaction of CEC Building Control.
Notes: The selection of the potential specific substances and hazards of concern has been guided by our experience of brownfield sites, the site history, the primary sources present and information/guidance provided in published DOE industry profiles, CLR-8 (officially withdrawn, but still a valuable resource), Environment Agency publication R&D66:2008 and other relevant references. These documents have been used as an additional screening tool to help assess the significance of contaminants and contaminant/hazard groupings and help decide which contaminants/hazards warrant consideration by the ESA as potential substances and hazards of concern.		

Table 9: Initial Conceptual Site Model & Preliminary Risk Assessment

Source	Pathway	Sensitive Receptor	Consequence	Likelihood	Risk Classification
Inorganic & organic substances in site soils & groundwater	Direct contact (Ingestion & Dermal) Inhalation of dust Inhalation of organic vapour	**Human Health** Future users	Medium to Severe	Likely	Moderate to High Risk
	Soils leaching to groundwater Perched water discharge to groundwater Lateral groundwater flow Discharge to surface waters Direct surface run-off	**Controlled Waters** Secondary A Aquifer beneath site, Warm Brook ~100m west of site	Medium	Likely	Moderate Risk
	Direct contact Contact with contaminated pore water	**BBM&S** Buildings, building materials and services	Medium	Likely	Moderate Risk
	Ground gas & soil vapour accumulation in buildings & services	**BBM&S** Buildings and services	Medium to Severe	Likely	Moderate to High Risk

4.0 CONCLUSIONS & RECOMMENDATIONS

4.1 Overview

This Phase I ESA has been undertaken in support of a forthcoming planning application to High Peak Borough Council for the redevelopment of the site for residential landuse. Where detailed recommendations are required, these have been provided in Section 4.5. The report has fulfilled the primary objectives of the assessment to:

1. Determine the potential for onsite or offsite land contamination issues arising from the current or historical uses of the site and surrounding area; and

2. Provide an initial assessment of potential risks that any such land contamination may pose to sensitive receptors on the redeveloped site, including future site users, controlled waters and infrastructure.

Evidence of potentially contaminative historical on-site landuse has been identified, substances associated with which may have the potential to affect sensitive receptors:

4.2 Preliminary Risk Assessment

Based upon the findings of the Phase I desk study, the PRA indicates:

- There is a *Moderate to High Risk* to future site users from potential site contamination.
- There is a *Moderate Risk* to surface waters and groundwater (controlled waters) from potential site contamination.
- There is a *Moderate Risk* to BBM&S from direct contact with potential site contamination.
- There is a *Moderate to High Risk* to BBM&S from ground gas & soil vapours.

Principal contamination issues are discussed in Section 4.4.

4.3 Conceptual Model Uncertainties

Following the completion of the desk study and PRA, various uncertainties have been identified in the CSM that require clarification to enable a more accurate assessment of potential risk associated with the redeveloped site use. The main uncertainties are considered to comprise:

- The presence, thickness and nature of made ground and superficial deposits across the site
- The presence of organic & inorganic substances of concern within made ground, shallow & deep site soils and shallow groundwater
- The presence of potential ground gas and volatile contaminant vapour generating materials beneath the site.

The identified uncertainties have the potential to affect the risk assessment findings and any conclusions subsequently drawn.

4.4 Principal Contamination Issues

Whilst various potentially contaminative off-site land uses have been identified, particularly the adjacent vehicle servicing garage, the principal potential contamination issues at the site relate to previous and contemporary on-site landuse.

Potentially contaminative on-site structures, features & processes were identified during the site walkover including above and below ground fuel storage, vehicle maintenance and equipment storage.

Significant hydrocarbon surface staining was observed within the northern site building (Ref. 'S1'), central building (Ref. 'S2') and around the vehicle fuelling facilities in the central site area. The vehicle servicing pits within the northern site building were observed to contain oily water, which is understood to drain to ground and un-bunded oil storage was also observed in the northern, central and eastern site building.

Anecdotal evidence indicates that historical on-site infrastructure including the below ground fuel storage tanks in the western site area and former below ground fuel pipe in the southern site area was suspected to have been compromised, resulting in unknown quantities of fuel loss and complaints of hydrocarbon odours from site users.

Where substances associated with historical and contemporary site processes have impacted the underlying ground, these have the potential to affect sensitive receptors including future site users & controlled waters.

4.5 Recommendations

Based on the findings of the Phase I desk study and preliminary risk assessment, Peak Environmental Solutions recommend that a Phase II intrusive investigation be conducted to achieve the following objectives:

- Allow identification & assessment of potentially contaminative materials in made ground, shallow & deep site soils.
- Allow identification & assessment of potentially contaminative materials in shallow groundwater beneath the site
- Allow assessment of potential risks from ground gases.
- Allow identification of risks posed by any identified contaminants to sensitive receptors through Generic Quantitative Risk Assessment (GQRA).

In addition to the works detailed above, the following aspects should be considered as part of the development:

- Risks posed to the site by radon emissions
- Presence of any invasive weed species within the site boundary

It is assumed that these works, where deemed necessary by HPBC, would not be required in support of the forthcoming planning application and would instead be conditioned as part of the planning permission.

5.0 ADDITIONAL REFERENCES

1. Environment Agency, 1994. CLR-2, Guidance on the Preliminary Site Inspection of Contaminated Land. Volumes 1 and 2.
2. National House Building Council (NHBC). 2000. Guidance for the Safe Development of Housing on Land Affected by Contamination. R&D P66
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5. Natural Environment Research Council, 1971. Geology of the Country Around Chapel-en-le-Frith.
6. Environment Agency. 2001. Assessment and Management of Risks to Buildings, Building Materials and Services from Land Contamination. R&D P5-035/TR/01
7. Department for Communities and Local Government. 2012. National Planning Policy Framework.
8. Department for Communities and Local Government. 2012. Technical guidance to the National Planning Policy Framework.

FIGURES

Figure 1: Site Location Plan



Notes
NOT TO SCALE - DO NOT SCALE.

Client
Centrebus Limited

Project
Bowers Coaches Phase I
Chapel-en-le-Frith

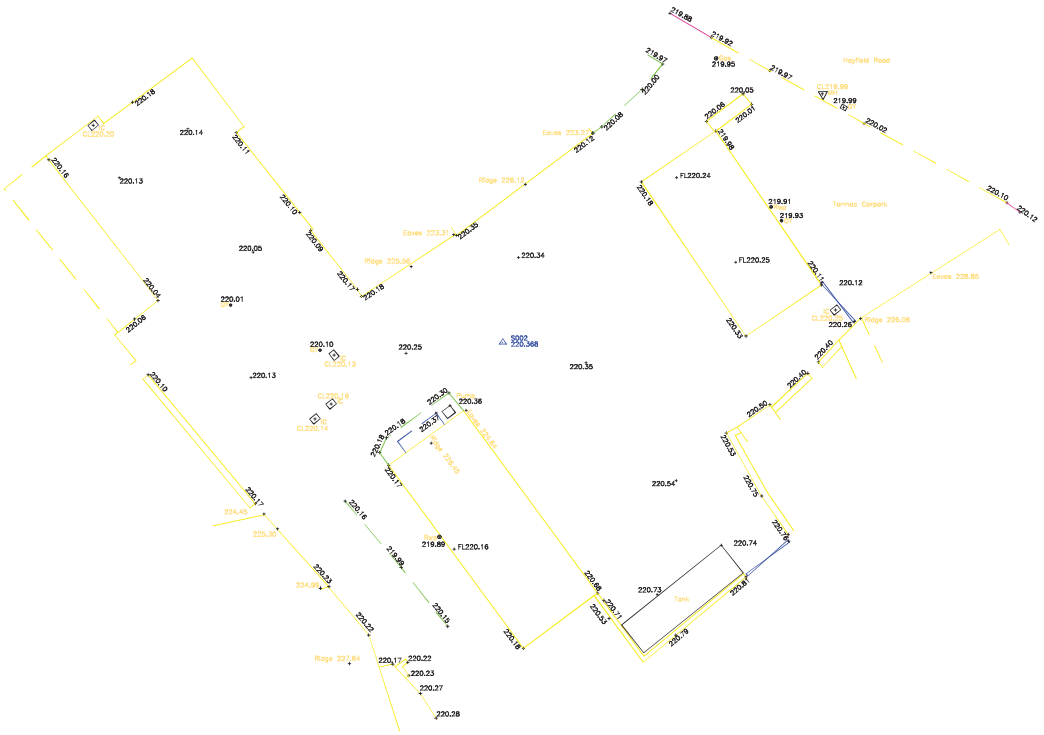
Title
Figure 1
Site Location Plan

Rev	Comment	Date

Drawn By	Authorised By	Original Scale
CT	CJD	NTS
Date: Jul 2012	Date: Jul 2012	Paper: A3

PEAK ENVIRONMENTAL SOLUTIONS
Chartech Building, Hope, Derbyshire
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Figure 2: Topographic Survey



0m 5m 10m

Scale

ABBREVIATIONS

A/C	AIR CONDITIONING
AH	ARCH HEIGHT
BT	BRITISH TELECOMMUNICATIONS
C	WINDOW CILL HEIGHT
Cab	CABINET
CBF	CLOSE BOARDED FENCE
CL	COVER LEVEL
DP	DISCHARGE PIPE
DC	DIAMOND CABLE COVER
DK	DROP KERB
FP	FOOTPATH
G	GULLY
GV	GAS VALVE
IC	INSPECTION CHAMBER
K	KERB
LP	LAMP POST
MH	MANHOLE
PCL	POST & CHAIN LINK FENCE
RWP	RAIN WATER PIPE
SA	SECURITY ALARM
SBM	SITE BENCH MARK
SH	SPRING HEIGHT
TP	TELEGRAPH POLE
WP	WASTE PIPE

LEGEND

DRAWING ISSUE STATUS

Issue	Details	By	Date
A	Original Survey	ATR	18/10/11

SHEET LAYOUT

THIS SURVEY HAS BEEN CARRIED OUT TO AN ACCURACY CONSISTENT WITH A PRESENTATION SCALE OF 1:200. INTERMEDIATE DIMENSIONS WILL BE WITHIN THE TOLERANCE ASSOCIATED WITH THIS AND SMALLER SCALES ONLY.

ALL LEVELS RELATE TO GPS Vis Now (OS 2002 Network)

ALL CRITICAL DIMENSIONS SHOULD BE VERIFIED ON SITE PRIOR TO ANY DESIGN OR CONSTRUCTION WORKS.

HSSP Architects

44 Ashfordby Road
Melton Mowbray
Leicestershire
LE13 0HR

Land to the rear Cemetery Road Sileby

Topographical Survey

SURVEYED AND DRAWN BY
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SCALE 1:100 @ A0

DATE OF ISSUE OCTOBER 2011

RCL JOB No. 1571 CHECKED ATR

DRAWING No. 1571-01-a ISSUE A

Figure 3: Site Walkover Observations





























Legend

- Approximate Site Boundary
- Proposed Trial Pit Location
- S1 Structure Reference
- A Feature Reference

Notes

NOT TO SCALE - DO NOT SCALE.

Client

Centrebus Limited

Project

Bowers Coaches Phase I
Chapel-en-le-Frith

Title

Figure 3
Site Walkover
Observations

Rev	Comment	Date

Rev	Comment	Date

Drawn By	Authorised By	Original Scale
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