

The Steading			Accumulation of ground gas within buildings and service conduits	Building fabric and services	Also a potential exists for ground gas/vapour from potentially gas generating materials within the soils pooling underneath buildings and within service trenches and/or voids within the site.	Moderate	High	Gas and PID Monitoring to CIRIA 665 followed by Ground Gas Risk Assessment of elevated levels of gases encountered at the site in accordance with CIRIA 665
	Potential Asbestos (cement bound roofing tile) noted in the building	Inhalation of potential fibres		Human: End-users	There is a possibility of a complete pollutant linkage to human end-users through inhalation (potential asbestos fibres) within the development.	High	High	Investigation, sampling & testing of the site in accordance with BS10175 and CLR11
				Humans: Construction and Maintenance Workers	A risk is present during the development works to construction and maintenance workers. Suspected asbestos containing materials (cement bound roofing tile) were identified during the walkover. This may create an active pollutant linkage with construction & maintenance workers during development.	High	High	<i>Appropriate PPE</i> <i>Safe systems of work</i>

Table 16: Preliminary Qualitative Risk Assessment for Identified offsite sources of contamination

Source	Contaminants of Concern	Potential Pathways	Potential Receptors	Assessment	Likelihood of Occurrence	Severity of Consequences	Action/ Investigation Required
Presented in Table 14	Presented in Table 14	Inhalation	Human: End-users	Review of the historic mapping suggests that there has been in-filling at the site with unknown materials (Made Ground). A risk is present from the inhalation of ground gases (and potentially vapours) which may form an active pollutant linkage to the end users of the site and require to be investigated and risk assessed.	High	High	Investigation, sampling & testing of the site in accordance with BS10175/CIRIA 665 and CLR11
				Investigation should be undertaken to confirm the presence of a tank/potential historic tank and associated infrastructure (i.e. slurry pit/chemical storage) at premises which were unable to be accessed during the walkover to assess if there is the potential to have caused contamination at the site.			Gas and PID Monitoring to CIRIA 665 followed by Ground Gas Risk Assessment of elevated levels of gases encountered at the site in accordance with CIRIA 665
			Humans: Construction and Maintenance workers	The surrounding area is within an 'Intermediate' Radon probability area. A conservative approach is being taken risk is present from the inhalation of ground gases or vapours may form an active pollutant linkage to the end users of the site and require to be investigated and risk assessed.			Radon Monitoring and/or mitigation require to be included within the proposed development.
				A potential risk exists from inhalation of ground gas/vapours which may pool beneath the buildings and within service trenches.	Moderate	High	<i>Appropriate PPE</i> <i>Safe systems of work</i>
		Accumulation of ground gas within buildings and service conduits	Building fabric and services	A potential exists for ground gas/vapour from potentially gas generating materials within the soils pooling underneath buildings and within service trenches and/or voids within the site.	Moderate	High	Investigation, sampling & testing of the site in accordance with BS10175/CIRIA 665 and CLR11 Gas and PID Monitoring to CIRIA 665 followed by Ground Gas Risk Assessment of elevated levels of gases encountered at the site in accordance with CIRIA 665

Risk Ratings key for Tables 15 and 16

- High The available information indicates a significant possibility of harm to a receptor requiring further investigation, assessment or treatment.
- Moderate The available information indicates a potential for significant harm to a receptor requiring further investigation or assessment.
- Low The available information does not indicate a significant potential for harm to a receptor requiring further investigation. This does not indicate a zero risk
- N/A The available information indicates no pollutant linkage possible. This indicates a zero risk.

9.0 Engineering Assessment

9.1. Geotechnical/Engineering Considerations for the Development

The following geotechnical/engineering constraints may be present at the site:

- Made Ground (including in-filled dams/quarries/landfills/farm tips)
- Alluvium (full extents currently unknown)
- Historic Foundations and Infrastructure (pumps and wells)
- Potentially shallow rockhead
- Potentially shallow groundwater
- Slopes/Earthworks
- Anticipated low infiltration potential of underlying soils
- Public and Private Utilities
- Roads and Pavements
- Material re-use (chemical and geotechnical)/Waste
- Concrete Specification

9.2. Made Ground

Due to the historic development undertaken at the site, Made Ground is anticipated to be present in the areas of former development, in-filled dams, landfills/farm tips and an Old Quarry identified in the historic mapping review and in sporadic locations of several mounds and hillocks of unknown materials present at the site. Made Ground is considered to be an unsuitable material for engineering purposes because of its inherently variable composition and unknown method of placement which can lead to highly variable engineering properties. Therefore, the presence of Made Ground would present a potential constraint to a development. It is recommended that investigation should be undertaken in areas where Made Ground is anticipated to be present.

9.3. Alluvium

[Section 4.1](#) highlighted that the superficial geology of the site varies greatly. In addition to Glacial Till, there are areas associated with Alluvium associated with clay, silt, sand and gravel. This may create varying engineering characteristics associated with the underlying strata i.e. Silts can settle more easily following loadings than sands and gravels. This may present a potential constraint to a development and therefore investigation in specific areas is required to ascertain the extent of the area and the depth of the Alluvium.

9.4. Historic Foundations and Infrastructure

Derelict buildings/steading blocks were noted during the walkover. The review of the available information (presented in [Appendices 2](#) and [3](#)) noted several structures or features of the historic development which may pose a constraint to the re-development. These principally included pumps, wells and demolished buildings/steadings. Dependent upon the extent of historic site clearance and layout of the proposed development these may present a geotechnical hazard to a proposed development. The geotechnical hazard is as a result of the presence of 'hard spots' or 'soft spots' or areas which may require significant break out prior to construction. The presence of such requires to be established via an intrusive investigation. If these are found to be present then, recommendations on how they should be dealt with would require to be made. [Drawing 72054/9012](#), [Appendix 1](#) presents a summary of the indicative location of these features.

9.5. Shallow Rockhead

The depth of rockhead is unknown at the site. Information from the BGS and the overall topography of the site suggests that rockhead in the area maybe quite variable and shallow in certain areas. This requires to be assessed by an intrusive investigation to ascertain the level of rockhead as this may present a constraint to a development and construction of buried infrastructure.

9.6. Shallow Groundwater

Shallow groundwater or impermeable waterlogged soils may be present within the Phase 1A Development Site. Intrusive investigation and assessment of the groundwater depth at the site should be undertaken to ascertain if this may present a constraint to the development and construction of infrastructure.

9.7. Anticipated low infiltration potential of underlying soils

Investigation and assessment of the infiltration rates of the underlying deposits will require to be ascertained for the purposes of SUDS design. However marshy conditions noted during the site walkover and offsite infiltration testing undertaken as part of a historic ground investigation ([Section 4.11.1](#)) may suggest infiltration potential may be low in certain areas of the Development. This requires further investigation.

9.8. Slopes/Earthworks

At this stage, there is not enough information to give an indication of the likely earthworks for the proposed development. Investigation and laboratory testing should be undertaken to assess the suitability of re-use for the soils on site as to ascertain if materials would require be importing or disposing of from the site.

9.9. Public and Private Utilities

Overhead cables are noted within the Phase 1A Development Site (electricity and telephone). Utility plans were not available to consult at the time of writing. Various inspection cover, manholes and drains were noted at the site therefore it is anticipated that there are public and private utilities present. Up to date plans should be consulted prior to any ground works to assess if utilities may cause a constraint to the proposed development.

9.10. Roads and Pavements

In situ CBR and/or plate load testing is recommended to allow suitable road formation levels and design characteristics. At this stage, finalised ground levels are unknown or if the roads within the Development are to be adopted by the Local Authority. This information should be ascertained prior to Development.

9.11. Waste

During development works at the site it is likely that some site preparation activities will necessitate excavation of materials. If suitable for re-use (chemically and geotechnically) the materials can be re-used on site without a waste management exemption as there would be no intention to discard the material. If the material is not suitable for re-use or required treatment prior to re-use this introduces waste management issues.

It is anticipated that there will be Topsoil encountered at the site, where this cannot be re-used onsite, this may require offsite disposal.

If the excavated material is deemed unsuitable for re-use and is destined for off-site disposal the waste status of the material will require to be determined and Waste Acceptance Criteria Testing carried out. All wastes destined for landfill must undergo some form of treatment. This can be as simple as sorting and segregation, which occurs in the case of most excavated wastes on construction sites anyway, but the fact that this has been done needs to be recorded. Sorting and segregation of the waste requires to be carried out under a mobile plant licence and therefore it is essential to ensure that the earthworks contractor is licensed for such activity.

If the intention is to treat excavated material to render it suitable for re-use this needs to be done under a mobile plant licence and the material that results from the treatment should conform to an appropriate recognised fill Specification. If the resulting material does conform to such a specification it is deemed to be a product and no longer a waste and it can be re-used on site without the need for an exemption from waste management licensing.

If however the material does not conform to a recognised specification but is to be used anyway then an exemption from waste management licensing will be required prior to emplacement taking place.

9.12. Concrete Specification

Aggressive or acidic conditions may be present at the site which could compromise the integrity of buried concrete. It is recommended that the pH and sulphate concentrations are assessed by an intrusive investigation, sampling and chemical testing to ascertain if an upgraded concrete specification is required as this may present a constraint (and subsequently abnormal costs) to the development and construction of infrastructure.

10.0 Conclusions

The main conclusions of this Geo-environmental Desk Study Report of the Phase 1A site are;

Environmental

Desk based investigation has indicated that historical and current land uses may have caused land contamination. To establish the effects that the historic/current source of contamination may have on the proposed development it is recommended that targeted and non-targeted ground investigation is undertaken.

Radon Gas (from natural sources) may be a potential issue at the site and appropriate investigation/assessment should be undertaken to assess the potential risk to the proposed development.

Geotechnical

Desk based review of gathered information has identified that there may be the following geotechnical/engineering constraints to overcome at the site;

- the presence of buried foundations/obstructions relating to former farms/steadings;
- shallow rockhead and shallow groundwater;
- low infiltration potential of underlying soils, varying engineering characteristics associated with the superficial deposits (including Glacial Till and Alluvium); and
- topography which may require cut and fill operations

It is recommended that a geotechnical investigation is undertaken to identify the presence and extent of the above, while establishing the general ground conditions/engineering characteristics within the proposed development area.

Additional Recommendations

An Asbestos Refurbishment/Demolition Survey should be undertaken at the steadings/farms which are being included within the development proposal prior to any site works.

It is recommended that a Botanical Survey of the site should be considered to confirm the absence of Invasive Species.

A detailed water features survey will be required at the Environmental Assessment stage. This assessment should include any springs, wells and abstractions, as well as discharges, surface water features and potentially sensitive habitat (ground water dependant terrestrial ecosystems – GWDTE) in the area

11.0 Recommendations

It is recommended that the potential sources of contamination and geotechnical constraints at the site are ascertained via intrusive site investigation.

The investigation should be focused on addressing the contamination and geotechnical issues identified by this Report and provide outline geotechnical information for design purposes once a development scheme has been finalised.

It is recommended that the intrusive ground investigation should:

- Investigate and confirm superficial deposits
- Investigate the identified possible sources of contamination.
- Investigate the areas which have been land filled (quarries and dams) which may be an environmental/geotechnical constraint to the proposed development
- Investigate presence and of groundwater beneath the site and flow direction.
- Investigate the generating potential of Ground Gases, Volatiles and Radon.
- Identify the permeability of the underlying soils at the site
- Soil sampling for identified contaminants of concern.
- Allow water sampling and chemical testing.
- Provide information to allow the design of foundations for the proposed development
- Confirm the general engineering characteristics of the ground over the whole of the site and identify if materials of the site are suitable for reuse in cut and fill operations.
- Identify any potential geotechnical constraints to the proposed development which may require further detailed investigation.

11.1. Recommendations for the Intrusive Investigation

The following recommended proposals should be carried out in accordance with the guidance set out in BS10175:2011 (Investigation of Potentially Contaminated Sites), BS5930:1999 (Code of Practice for Site Investigations), R&D Technical Report P5-065/TR (Technical Aspects of Site Investigation) and CIRIA C665 (Assessing risks posed by hazardous ground gases to buildings).

It is recommended that the targeted intrusive ground investigation should comprise the following:

- Boreholes to ascertain the depth/presence of Made Ground and confirm the nature and suitability of the underlying natural materials. The boreholes would be required to be formed at a suitable depth to allow the installation of ground gas/vapour and groundwater standpipes where considered appropriate.
- Trial Pitting to enable comprehensive soil sampling of superficial deposits within the site, to assess the depth and type of existing foundations and to identify any former buried structures (i.e. former foundations).
- Appropriate geotechnical and environmental (soil and groundwater) samples.
- Chemical testing to address the contaminants of concern.
- Geotechnical Testing (laboratory).
- In-situ Geotechnical testing (i.e. California Bearing Ratio tests (CBR's) targeted to roads and Infiltration Testing targeted to detention ponds).
- Ground Gas and Volatile generating potential to be assessed as per CIRIA 665.
- Further Reporting and Tier 1 Risk assessment including WRAS and BRE assessment.

It is recommended that a non-targeted investigation of the Phase 1A Development Site is undertaken for buildings and infrastructure. The investigation should comprise the following:

- Trial Pitting on a wide grid to enable comprehensive soil sampling of superficial deposits within the site.
- Boreholes over the remainder of the site to ascertain the depth/presence of Made Ground and confirm the nature and suitability of the underlying natural materials. The boreholes would be required to be formed at a suitable depth to allow the installation of groundwater monitoring standpipes where considered appropriate.
- Appropriate geotechnical and environmental samples.
- Geotechnical Testing (laboratory and in-situ).

Further Recommendations

- An Asbestos Refurbishment/Demolition Survey should be undertaken at the steadings/farms which are being included within the development proposal prior to any site works.
- It is recommended that a Botanical Survey of the site should be undertaken to confirm the absence of Invasive Species at the site.
- A detailed water features survey will be required. This should include any springs, wells and abstractions, as well as discharges, surface water features and potentially sensitive habitat (ground water dependant terrestrial ecosystems – GWDTE) in the area ([Appendix 5](#)).

Appendix 1:

Drawings

72054/9001-A	Site Location Plan
72054/9013	Phase 1A Walkover Summary
72054/9011	Approximate location of potentially contaminative sources for Phase 1A
72054/9012	Approximate location of potential geotechnical constraints for Phase 1A
72054/9005	Phase 1A Preliminary Conceptual Site Model

Appendix 2:

Summary of the Historic Mapping Review:

Envirocheck Mapping Summary Tables

Summary of the Historic Mapping Review

The historic development of the site was established from historic Ordnance Survey maps (presented in [Appendix 2](#)).

The findings are summarised in [Table B](#). The location of historic uses with the potential to cause development constraints (environmental and geotechnical) are identified on [Drawings 72054/9011](#) (environmental) and [72054/9012](#) (geotechnical) which are presented in [Appendix 1](#).

[Table A](#) presents a summary of the mapping sheets reviewed for the Phase 1A Development Site.

Table A: Summary of Historic Mapping Segments

Historic Mapping Segments (presented digitally in Appendix 2)	
A2, A3, A4, A6, A7, A8, A11, A12	
B1, B2, B5, B6	

Table B: Historic development of the site from historic maps

Date	Notable Features	Potential Contamination Sources	
		On-site	Off Site
1866-92	<p>Onsite</p> <ul style="list-style-type: none"> There is an unlabeled watercourse which runs in a west-east direction (A12). The site section (B1) notes Nether Cairnhill (assumed farm/steading) on the southern boundary of the site. The remainder of the mapping sheet is associated with filled boundaries an area of reeds. The site section (B5) notes Windyedge (a farm/steading). There is an Old Quarry (20m x 10m) adjacent to the south-eastern boundary (B2). <p>Offsite</p> <ul style="list-style-type: none"> There is an area labelled Roughpark (A3) approximately 100m south of the site. There is a farm/steading labelled Bents of Muchals and an associated well approximately 300m south of the site boundary. Greenheads (an assumed farm/steading) is approximately 220m south of the site boundary. West Mains of Monduff is approximately 70m south-east of the site and Burn of Pheppie and associated well is approximately 20m south of the site (both are assumed farm/steading) Hillhead (Public House) is approximately 20m from the site boundary. The remainder of the surrounding area (mapping section B2) is associated with field boundaries and occasional buildings (Crollshillock and Episcopal School). 	<p>Upper Cairnhill Nether Cairnhill</p>	<p>Offsite Windyedge Old Quarry Activities (B2)</p>
1903	<p>Onsite</p> <ul style="list-style-type: none"> There is a Dam (20m x 20m) and associated sluice in relation to Nether Cairnhill. Windyedge (B5) has increased in size, there is a cistern (6m x 1m) noted, a Smithy and Cairnhill School. The Old Quarry has reduced in size (potentially in-filled). <p>Offsite</p> <ul style="list-style-type: none"> Rockhead (1867) is no longer noted in the mapping (A4). The unlabelled outline (1867) is noted as a Dam with associated Sluice (A4). It is assumed to be associated with the adjacent Greenheads property. West Mains of Monduff is labelled West Monduff. Burn of Pheppie has an associated Dam (55m x 8m) and associated Sluice. 	<p>As per previous editions of mapping.</p>	<p>Offsite Smithy In-filled Old Quarry</p>
1968-77	<p>Onsite</p> <ul style="list-style-type: none"> There is an additional building to the west of Upper Cairnhill (assumed to be residential in nature). The Pheppie Burn is noted adjacent to the southern boundary; it is flowing in an easterly direction. The dam in relation of Nether Cairnhill is no longer labelled, potentially in-filled. The Smithy is no longer labelled (however the building remains as per previous editions of the mapping). There is also a Schoolhouse, Smithy Croft and Smithy Cottage noted to the south. There are labelled properties including Windyedge, East Windyedge. 	<p>In-filled Dam (Nether Cairnhill)</p>	<p>Offsite East Windyedge Schoolhouse Smithy Croft Smithy Cottage</p>

	<ul style="list-style-type: none"> The Old Quarry is no longer noted in the mapping (potentially in-filled) <p>Offsite</p> <ul style="list-style-type: none"> The Dam and associated Sluice at Greenheads are no longer mapped. It has potentially been in-filled. The dam in relation of Burn of Pheppie Steading is no longer labelled in the mapping, potentially in-filled. There has been road upgrades, the 'A92' is noted to the east of the site. 1969: There is a Garage approximately 20m south-east of the site (B6). 1977: There has been significant residential development and associated infrastructure (football ground/tennis courts) to the east of the site. There is a tank farm approximately 20m east of the site (noted to the south of the telephone exchange). 1977: There are 2no. filling stations, one approximately 20m north of the Phase 1a Boundary and the other approximately 30m south of the site (B6). 		<p>Offsite</p> <p>In-filled Dam (Greenheads) In-filled Dam (Burn of Pheppie) Tank Farm (1977-1980) Garage 2no. filling stations</p>
1969-91	<p>Onsite</p> <ul style="list-style-type: none"> 1977: There is an electricity sub-station (B5) noted. 1980: Cairnhill School (B5) is labelled as Disused. 1989: Cairnhill School is labelled as Chimneys. 1991: Upper Cairnhill (A8) has reduced significantly in size (referred to as The Steading during the walkover) <p>Offsite</p> <ul style="list-style-type: none"> 1977: The A92 to the east of the site has been significantly upgraded to a dual carriageway. 1980: The residential development and associated infrastructure (1969-1977) is labelled as Newtonhill. 1980: The tank farm (20m east of the site) is no longer noted in the mapping (B2). 1982: The residential development and associated infrastructure is noted approximately 60m east of the site. 1990: The filling stations (1977) are no longer labelled. 1990: There has been infrastructure upgrades within the site from the A92 to the east. 1990: There has been infrastructure upgrades encompassing fly-over/slip-roads from the A92 to Newtonhill. There has been further development to the east of the site. 	Electricity sub-station The Steading	<p>Offsite</p> <p>The Chimneys (Cairnhill School)</p>
1995	<p>Onsite</p> <ul style="list-style-type: none"> The site remains as per previous mapping editions (undeveloped and associated with field boundaries). 	As per previous editions of mapping.	<p>Offsite</p> <p>As per previous editions of mapping.</p>

Envirocheck Mapping Summary Tables

Segment	Sheet	Map Sheet	Scale	Date
A3	Kincardineshire	007_16-012_04	1:2,500	1866-67
A3	Kincardineshire	011_09	1:2,500	1903
A3	Ordnance Survey Plan	NO8893-NO8892	1:2,500	1969
A3	Large-scale National Grid	NO8893-NO8892	1:2,500	1995
A4	Kincardineshire	007_16-012_04	1:2,500	1866-67
A4	Kincardineshire	011_09	1:2,500	1903
A4	Ordnance Survey Plan	NO8893-NO8892-NO8993-NO8992	1:2,500	1969
A4	Additional SIMs	NO8893	1:2,500	1991
A4	Large-scale National Grid	NO8893-NO8892-NO8993-NO8992	1:2,500	1995
A6	Kincardineshire	007_16	1:2,500	1867
A6	Kincardineshire	010_12-011_09	1:2,500	1903
A6	Ordnance Survey Plan	NO8794-NO8793-NO8894-NO8893	1:2,500	1969
A6	Large-scale National Grid	NO8794-NO8793-NO8894-NO8893	1:2,500	1995
A7	Kincardineshire	007_16	1:2,500	1867
A7	Kincardineshire	011_09	1:2,500	1903
A7	Ordnance Survey Plan	NO8894-NO8893	1:2,500	1969
A7	Large-scale National Grid	NO8894-NO8893	1:2,500	1995
A8	Kincardineshire	007_16	1:2,500	1867
A8	Kincardineshire	011_09	1:2,500	1903
A8	Ordnance Survey Plan	NO8894-NO8893-NO8994-NO8993	1:2,500	1969
A8	Additional SIMs	NO8993	1:2,500	1991
A8	Large-scale National Grid	NO8894-NO8893-NO8994-NO8993	1:2,500	1995
A11	Kincardineshire	007_12-007_16	1:2,500	1867
A11	Kincardineshire	011_05-011_09	1:2,500	1903
A11	Ordnance Survey Plan	NO8894	1:2,500	1969
A11	Large-scale National Grid	NO8894	1:2,500	1995
A12	Kincardineshire	007_12-007_16	1:2,500	1867
A12	Kincardineshire	011_05-011_09	1:2,500	1903
A12	Ordnance Survey Plan	NO8894-NO8994	1:2,500	1969
A12	Large-scale National Grid	NO8894-NO8994	1:2,500	1995
B1	Kincardineshire	007_16-012_04-008_13-013_01	1:2,500	1866-92
B1	Kincardineshire	011_09-011_10	1:2,500	1903
B1	Ordnance Survey Plan	NO8993-NO8992-NO9093-NO9092	1:2,500	1969
B1	Additional SIMs	NO8993-NO9093-NO9092	1:2,500	1969-91
B1	Ordnance Survey Plan	NO9093	1:2,500	1980
B1	Additional SIMs	NO9093-NO9092	1:2,500	1982-85
B1	Additional SIMs	NO9093	1:2,500	1985
B1	Additional SIMs	NO9093	1:2,500	1989
B1	Additional SIMs	NO9093	1:2,500	1990
B1	Additional SIMs	NO9093	1:2,500	1992
B1	Large-scale National Grid	NO8993-NO8990-NO9093-NO9092	1:2,500	1995
B1	Large-scale National Grid	NO9093	1:2,500	1995
B1	Large-scale National Grid	NO9093	1:2,500	1997
B2	Kincardineshire	008_13-013_01	1:2,500	1867-92
B2	Kincardineshire	011_10	1:2,500	1903
B2	Ordnance Survey Plan	NO9093-NO9092	1:2,500	1969
B2	Additional SIMs	NO9093-NO9092	1:2,500	1969-77
B2	Ordnance Survey Plan	NO9093	1:2,500	1980

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FAIRHURST

B2	Additional SIMs	NO9093-NO9092	1:2,500	1982-85
B2	Additional SIMs	NO9093	1:2,500	1985
B2	Additional SIMs	NO9093	1:2,500	1989
B2	Additional SIMs	NO9093	1:2,500	1990
B2	Additional SIMs	NO9093	1:2,500	1992
B2	Large-scale National Grid	NO9093-NO9092	1:2,500	1995
B2	Large-scale National Grid	NO9093	1:2,500	1995
B2	Large-scale National Grid	NO9093	1:2,500	1997
B5	Kincardineshire	007_16-008_13	1:2,500	1867-92
B5	Kincardineshire	011_09-011-10	1:2,500	1903
B5	Ordnance Survey Plan	NO8994-NO9094-NO8993-NO9093	1:2,500	1969
B5	Additional SIMs	NO9094-NO8993-NO9093	1:2,500	1977-91
B5	Ordnance Survey Plan	NO9093	1:2,500	1980
B5	Additional SIMs	NO9093	1:2,500	1982
B5	Additional SIMs	NO9093	1:2,500	1985
B5	Additional SIMs	NO9093	1:2,500	1989
B5	Additional SIMs	NO9093	1:2,500	1990
B5	Additional SIMs	NO9093	1:2,500	1992
B5	Large-scale National Grid	NO8994-NO9094-NO8993-NO9093	1:2,500	1995
B5	Large-scale National Grid	NO9094-NO9093	1:2,500	1995
B5	Large-scale National Grid	NO9093	1:2,500	1997
B6	Kincardineshire	008_13	1:2,500	1892
B6	Kincardineshire	011_10	1:2,500	1903
B6	Ordnance Survey Plan	NO9094-NO9093	1:2,500	1969
B6	Additional SIMs	NO9094-NO9093	1:2,500	1977
B6	Ordnance Survey Plan	NO9093	1:2,500	1980
B6	Additional SIMs	NO9093	1:2,500	1982
B6	Additional SIMs	NO9093	1:2,500	1985
B6	Additional SIMs	NO9093	1:2,500	1989
B6	Additional SIMs	NO9093	1:2,500	1990
B6	Additional SIMs	NO9093	1:2,500	1992
B6	Large-scale National Grid	NO9094-NO9093	1:2,500	1995
B6	Large-scale National Grid	NO9094-NO9093	1:2,500	1995
B6	Large-scale National Grid	NO9093	1:2,500	1997
B9	Kincardineshire	007_12-007_16-008_09-008_13	1:2,500	1866-92
B9	Kincardineshire	008_09	1:2,500	1895
B9	Kincardineshire	011_05-011_09-011_06-011_10	1:2,500	1903
B9	Ordnance Survey Plan	NO8994-NO9094	1:2,500	1969

Segment	Sheet	Map Sheet	Scale	Date
Slice A	Kincardineshire	00700-01200	1:10,560	1868
Slice A	Aberdeenshire	094B00	1:10,560	1869
Slice A	Kincardineshire	010NE-010SE-011NW-011SW	1:10,560	1904
Slice A	Ordnance Survey Plan	NO89NE-NO89SE	1:10,000	1959
Slice A	Ordnance Survey Plan	NO89NE-NO89SE	1:10,000	1971
Slice A	Ordnance Survey Plan	NO89SE	1:10,000	1987
Slice A	10K Raster Mapping	NO89NE-NO89SE	1:10,000	2000
Slice A	10K Raster Mapping	NO89NE-NO89SE	1:10,000	2006
Slice A	10K Raster Mapping	NO89NE-NO89SE	1:10,000	2010
Slice B	Kincardineshire	00700-01200-00800-013000	1:10,560	1865-68
Slice B	Kincardineshire	011NW-011SW	1:10,560	1904
Slice B	Ordnance Survey Plan	NO89NE-NO89SE-NO99NW-NO99SW	1:10,000	1959
Slice B	Ordnance Survey Plan	NO99NW	1:10,000	1968
Slice B	Ordnance Survey Plan	NO89NE-NO89SE- NO99SW	1:10,000	1970-71
Slice B	Ordnance Survey Plan	NO89SE-NO99NW-NO99SW	1:10,000	1980-89
Slice B	Ordnance Survey Plan	NO99NW	1:10,000	1989
Slice B	Ordnance Survey Plan	NO99NW-NO99SW	1:10,000	1994-95
Slice B	10K Raster Mapping	NO89NE-NO89SE-NO99NW-NO99SW	1:10,000	2000
Slice B	10K Raster Mapping	NO89NE-NO89SE-NO99NW-NO99SW	1:10,000	2006
Slice B	10K Raster Mapping	NO89NE-NO89SE-NO99NW-NO99SW	1:10,000	2010

Appendix 3:

Fairhurst Site Walkover Proforma (27 April 2011)

Appendix 4:

Principles of Environmental Risk Assessment

Principles of Environmental Risk Assessment

The Environmental Protection Act (1990), Part II A Contaminated Land (Section 57 of the Environment Act 1995), revised by Scottish Statutory Instrument No.658 (2005), and the Contaminated Land Regulations (1999) provide a basis on which to determine the risks and liabilities presented by a contaminated site. Contaminated Land is defined within Annex 3, Chapter A Part 1- Scope of Chapter and in all those Sections mentioned as:

“Any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land that-

- (a) Significant harm is being caused or there is significant possibility of such harm being caused; or*
- (b) Significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused.”*

Section 57 of the Environment Act 1995 requires that any site identified as being “contaminated” by the Local Authority will be registered by them and remediation will be required to render the site fit for use.

The presence of contamination is not the sole factor for deciding whether a site is contaminated. Relevant parties should identify site-specific risks and provide objective, cost-effective methods to manage the contamination in a manner that satisfies the proposed end-use.

A risk-based approach, which takes both technical and non-technical aspects into consideration when making decisions on contamination resulting from past, present or future human activities, is advocated. The assessment of environmental risks generally relies on the identification of three principal elements forming a ‘pollutant linkage’:

SOURCE: the contaminant
PATHWAY: the route through which the contaminant can migrate, and
RECEPTOR: any human, animal, plant, water environment or property that may be adversely affected (harmed) by the contaminant

In the absence of any one of these elements, on any given site, there is no risk. Where all three elements are present, risk assessment is required to determine the significance of the harm that is being or may be caused. As outlined above, the terms of the Contaminated Land regime specify that remediation need only be implemented where a site is causing, or there is a significant possibility that it will cause, significant harm, or significant pollution to the water environment.

Development of contaminated land is usually addressed through the application of planning and development legislation and guidance (i.e. Planning Advice Note 33). The suitable for use approach is seen as the most appropriate to deal with contaminated land, taking account of environmental, social and economic objectives. The assessment is made in the context of the proposed land use (i.e. residential, retail, open-space and tourist developments).

Appendix 5:

Fairhurst Consultation Letters and Responses

Summary of Scoping Opinion Responses

- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage (SNH)
- National Biodiversity Network (NBN)
- Aberdeenshire Council Archaeology Service
- Historic Scotland
- Health and Safety Executive (HSE)
- Aberdeenshire Council (various Departments)
- Turnberry Planning Information

Complete responses are available digitally presented in Appendix 5 of the enclosed CD.

Scottish Environment Protection Agency EIA Scoping Opinion Response

A SEPA Officer was also contacted by Aberdeenshire Council's Planning Department with regard to providing an EIA Scoping Opinion. The response dated 29th April 2011 confirmed that:

Waste water drainage

- "...there are infrastructure capacity issues for such a major development and there is a definite need for a new public foul sewer and associated pumping stations to transport flows to Nigg Waste Water Treatment Plant...Portlethen Pumping Station is currently undersized and any new sewer should be directed to Cove Pumping Station".

Surface water drainage

- "...for this scale of development it is essential that there is recognition of green corridors and SUDS as amenity across the area".

Engineering activities in the water environment

- if the proposed engineering works are likely to exacerbate flood risk then a flood risk assessment (FRA) should be submitted in support of the planning application and SEPA should be consulted".

Hydrogeology

- "...Section 6.11 notes that a Phase I Geo-environmental study will be undertaken".
- "...A detailed water features survey will be required. This should include any springs, wells and abstractions, as well as discharges, surface water features and potentially sensitive habitat (ground water dependant terrestrial ecosystems – GWDTE) in the area. Grid references for all features should be provided. Wells and springs should be investigated as to condition and any current usage. Appropriate assessment of the potential risks posed by the proposed scheme to each receptor will be required. If risks are identified SEPA would expect to see proposals for any necessary mitigation measures".
- "...the applicant will need to provide detailed plans of the proposal with any cuttings or excavations for roads or building developments clearly defined and address any groundwater drainage/abstraction requirement at the planning application stage and therefore we advise that this information is provided and assessed as soon as practicable".
- "...A private water supply survey should be undertaken to identify any that may be present in the vicinity. If Private Water Supplies (PWS) are present, a full and site specific risk assessment should be undertaken and included within the Environmental Statement".
- "...If risk to or abstraction to a PWS or GWDTE is identified the ES should either:
- Provide a quantitative hydrogeological assessment that establishes the size of the Zone of Contribution feeding groundwater to the water supply or GWDTEs and identifies the proportion of flow that will be reduced as a consequence of any construction. This will need to be accompanied by a risk assessment that identifies whether this reduction in flow is significant. For water supplies, this will need to take account of the impact of the reduction in flow on the level of water in the supply as compared with the pump or outflow level. For GWDTEs, this will require an ecological assessment of the environmental supporting conditions of the GWDTE.

- Or demonstrate that the applicant has agreed with the owner of the abstraction to provide an alternative supply.
- "...It is noted that an initial ground contamination assessment will be undertaken. It is recommended that the applicant identify, characterise and appropriately assess any potentially contaminated land in accordance with present regulations and SEPA guidelines. If significant contamination is identified, then remediation and/or other mitigation measures may be required".

River Basin Management Planning (RBMP)

- "...SEPA note that existing water features will be incorporated into the development...whilst SEPA welcome the process taking into account of the RBMP, changes in rivers can lead to changes in erosion patterns and lead to longer term problems. All intensions should be discussed with SEPA to discuss the potential effects on habitats and how water bodies function".

Use of Waste as a Resource

- "...there appears to be no mention of the potential for a heat and power plant onsite in the post-Charrette paper. Consideration of potential sources of heat and power at this early stage can avoid future requirements to retro-fit houses and pipelines to make use of heat and power providers and should be encouraged".

The full SEPA EIA Scoping Opinion responses are also presented in [Appendix 5](#).

Scottish Natural Heritage EIA Scoping Opinion Response

A SNH Officer was also contacted by Aberdeenshire Council's Planning Department with regard to providing advice in response to the Scoping Report ([Appendix 6](#)). A response dated 26th April 2011 confirmed that:

- "...The proposal could result in significant environmental impacts as the site has the potential to be used by species of conservation concern and species with special protection. The proposal could have significant landscape and visual impacts".
- "...An Environmental Statement or an Environmental Report should cover all aspects of the proposal that have the potential to have an impact upon the environment"
- "...If it is considered that the proposal is likely to have a significant effect on the qualifying interests of one or more European sites then an Appropriate Assessment must be carried out by a competent authority. Aberdeenshire Council is to consider the implications of the proposal for these qualifying interests".

Red Moss of Netherley Special Area of Conservation

[Red Moss of Netherley Special Area of Conservation (SAC) is located approximately 2km west of the Phase 1A Development Boundary. Following an investigation of the SEPA River Basin Management Plan, it should be noted that the Red Moss of Netherley SAC is located within the River Dee (Grampian) Catchment Area and appears to be associated with the Crynoch Burn (moderate classification status). The proposed development and both watercourses (Burn of Elsick and Burn of Pheppie) are located within the Kincardine and Angus Coastal Catchment Area and flow in an easterly direction (SEPA River Basin Management Plan). As the Red Moss and the Phase 1A are in different Catchment areas it is not considered that the proposed works would negatively impact the Red Moss of Netherley Special Area of Conservation.]

Landscape and Visual Impact Assessment

"...the proposal could raise landscape and visual impacts of local significance. SNH support the methodology proposed which is in accordance with 'Guidelines for Landscape and Visual Impact Assessment' and through the Charrette Process. The Proposal of this scale and nature that further detailed assessment is undertaken to identify local landscape character, particularly with respect to the Estate and Designated Landscape surrounding Elsick House".

Further advice on Birds, Protected Species (Bats, Otters, Red Squirrels, Water Voles and Badgers), Habitats, Landscape and Visual Impact Assessment and Green Networks are presented within the response letter.

A copy of the SiteLink database search for the site is also presented in [Appendix 5](#).

National Biodiversity Network

A request for relevant information relating to the site was undertaken on the National Biodiversity Network (NBN) website on the 26th April 2011. The search confirmed that NBN's records indicate that there may be various terrestrial mammals species including bats within the vicinity of the site (*Pipistrellus Pipistrellus Sensu Lato*), Otters and Badgers. It should be noted that the NBN website only provides a basic overview to potential species within an area and is not a comprehensive species survey. A full list of species can be identified on

<http://data.nbn.org.uk/gridSquares/10kmSquareSpeciesList.jsp>.

The client should satisfy themselves with regard to the presence or not of protected species on the site.

Aberdeenshire Council Archaeology Service EIA Scoping Opinion

Aberdeenshire Council Archaeology Service was contacted by Aberdeenshire Councils Planning Department with regard to providing an EIA Scoping Opinion. The response dated 30th March 2011 confirmed that:

- "...CFA Archaeology Ltd (Archaeological Contractor) has approached Aberdeenshire Council Archaeology Service to obtain baseline data and comments on the area concerned".
- "...reference is made to PASTMAP website for an initial assessment of known archaeological sites occurring within the proposed development area and its immediate vicinity...the PASTMAP data is significantly out of date and is provided with an express caveat that it should not be used for development management purposes...as part of any further work relating to this development, the PASTMAP data should be ignored".
- "...Section 5.3 [Scoping Report, [Appendix 6](#)] should also note the potential impact on the setting of Scheduled Ancient Monuments".
- "...the approach outlined for the Cultural Heritage aspect of the EIA is acceptable".
- "...considering the local topography of the area and the prehistoric activity demonstrated by known archaeological sites in the general vicinity there is certainly potential for archaeological remains to survive within the outlined development area... Aberdeenshire Council Archaeology Service would expect mitigation to include 7% - 10% evaluation where appropriate, an assessment on any potential impacts on the Scheduled Ancient Monuments to the north of the site and a Strategy for dealing with the Medieval Drove Road of Causey Mounth".

It is understood that all further works pertaining to archaeological interest at the site will be undertaken by CFA Archaeology Ltd (the Archaeological Contractor) for the Development.

The full Aberdeenshire Council Archaeology Service EIA Scoping Opinion response is presented in [Appendix 5](#).

Historic Scotland EIA Scoping Opinion

Historic Scotland was contacted by Aberdeenshire Council's Planning Department with regard to providing an EIA Scoping Opinion (their remit covers the Scheduled Monuments and their setting, Category A Listed Buildings and their setting and gardens and Designed Landscapes appearing on the Inventory). The response dated 18th April 2011 confirmed that:

- "...[Historic Scotland] have not raised any objections to the allocation through the Local Development Plan process, Historic Scotland broadly consent with the principle of the proposal. However impacts for the historic environment may still arise as a result of the specific design parameters and layout that are adopted for the site".

Potential impacts to be considered

- "...there are no sites for which we have statutory interest located within the development site boundary".
- "...It will be important when considering the design and layout of the site to use sensitive design and where suitable, screening to maintain these monuments within an appropriate setting".
- "...If an Environmental Statement [ES] is to be produced for this development it should consider impacts upon these assets and any other sites in the wider areas which the developer believes may experience significant impacts...the ES should also consider the cumulative impacts of this development in combination with others of a similar type in the vicinity".

The full Historic Scotland EIA Scoping Opinion response is presented in [Appendix 5](#).

All received consultations to date are presented in full on to attached CD ([Appendix 5](#)) information

Reference	Address	Description	Status/ Contaminated Land Conditions
Ofsite	APP/2009/2952	Change of Use to Class 6 Storage and Distribution and Class 5 General Industrial (Retrospective)	Pending
Ofsite	APP/2010/3348	Erection of Agricultural Building (Retrospective)	Pending
Ofsite	APP/2010/3244	Mixed Use Development Including 70 Dwellingshouses, 5 Commercial Units, Childrens Nursery and Associated Roads, Landscaping, Drainage, Pond and Paths	Pending
Ofsite	APP/2010/1158	Formation of Open Storage Yard / Employment Land	Granted subject to Conditions No Contaminated Land Conditions
Ofsite	APP/2010/0672	Conversion of Steading to Form Business Centre and Formation of Vehicular Access	Granted subject to Conditions No Contaminated Land Conditions
Ofsite	APP/2010/0095	Change of Use from Warehouse and Associated Offices to Training Centre (Sui Generis), Installation of No. 3 Steel Containers and Alterations to Building to Form New Entrance Door and Window	Granted subject to Conditions No Contaminated Land Conditions
Ofsite	APP/2009/4030	Change of Use to Form Car Park and Formation of New Access, provision of 18 spaces plus 2 disabled spaces	Granted subject to Conditions No Contaminated Land Conditions
Ofsite	APP/2009/3548	Extension to Office Premises to include a 1260 m2 office extension and an additional 2835 m2 workshop extension	Granted subject to Conditions No Contaminated Land Conditions
Ofsite	APP/2009/2530	Residential Development (60 Houses)	Pending
Ofsite	APP/2009/2526	Erection of Workshop/Warehouse with Associated Offices and Car Parking (42 x spaces)	Pending
Ofsite	APP/2009/2598	Formation of Storage Yard	Granted subject to Conditions
Ofsite	APP/2009/2470	Erection of Manufacturing Building with Office Accommodation, Associated Car Parking (137 spaces + 5 disabled spaces) and Landscaping	Granted subject to Conditions
Ofsite	APP/2009/2484	Residential Development (40 Dwellingshouses)	Granted No Contaminated Land Conditions
Ofsite	APP/2009/2308	Retail Development - Tesco	Granted subject to Conditions No Contaminated Land Conditions
Ofsite	APP/2009/2401	Residential Development (125 Dwellingshouses)	Pending
Ofsite	APP/2009/0996	Extension to exiting warehouse facility	Granted subject to Conditions No Contaminated Land Conditions
Ofsite	APP/2010/3646	Mixed Development Including Residential, Employment and Retail Land Uses with Landscaping, Formation of Bridge, Roads, Cycleways and Paths and All Other Associated Engineering Works	Pending
Ofsite	APP/2010/2257	Erection of 60 Bed Care Home and 8 No Dwellingshouses with Associated Car	Granted subject to Conditions