

Campus West

Remediation Strategy



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A115249-LDN-N-CW-01	Site Location Plan
A115249-LDN-N-CW-02	Exploratory hole location plan.

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1.0 INTRODUCTION

1.1. GENERAL

This document comprises the Remediation Strategy for a proposed decked car park development at Campus West car park, Welwyn Garden City, following intrusive investigations reported within A115249 Campus West Ground Investigation Report (July 2020) for Welwyn Hatfield Borough Council and Bourne Group, the developers of the Campus West site.

The subject site is situated within Campus West Car Park, The Campus, Welwyn Garden City AL8 6BX, as indicated on drawing A115249-LDN-N-CW-01.

1.2. REMEDIATION BRIEF AND OBJECTIVES

The previous intrusive site investigation report and risk assessment undertaken by Tt (formerly WYG) in March 2020 indicated no gross ground contamination. Although some contaminants were identified in excess of their relevant criteria, these were limited, and the source-pathway-receptor linkage was considered to be absent due to various factors such as extent of proposed hardstanding. No specific targeted soil or groundwater remediation is considered to be required to address risks to either human health or controlled water receptors. However, unexpected soil conditions may be uncovered during the process of ground excavations during construction. This document outlines the 'reactive strategy' approach to encountering unexpected contamination and outlines the overall strategy to address the identified pollutant linkages whilst considering the particular constraints relevant to this site.

1.3. REGULATORY CONSULTATION

No regulatory discussions have been undertaken by Tt at this stage. It is intended that this report will be issued to Bourne Group Ltd who will in turn submit as part of the application to discharge pre-commencement of development condition no.6. The condition was applied by Welwyn Hatfield Borough Council during planning consent ref: 6/2021/2207/MAJ dated 17th December 2021. As part of planning condition discharge, this strategy may be issued by the Client to the Local Authority (Welwyn Hatfield Borough Council) and the Environment Agency (EA) for their comment and ultimate agreement on the approach to the reactive remedial strategy detailed herein.

1.4. INSTRUCTION AND REPORT CONDITIONS

Tetra tech Ltd (Tt) was commissioned by Bourne Group Ltd to carry out a Remediation Strategy Report on the site at Campus West, Welwyn Garden City in accordance with our accepted proposal letter dated 13th December 2021.

The information contained in this report is intended for the use of Bourne Group Ltd and is subject to the conditions set out in Appendix A. Tt can take no responsibility for the use of this information by any third party for uses other than that described in this report.

The observations summarised in this report are based on Tt (formerly WYG) investigations and observations, third party information provided and other sources of readily available information. Tt is not able to provide warranty on the accuracy of any third-party information and this information has been used in good faith. Any constraints relating to the site investigation undertaken by Tt, as outlined in the relevant reports, should also be borne in mind and have been considered herein. Notably, ground conditions between investigation points have been extrapolated and interpreted from proximal data and a review of records but localised, unexpected variations to such can be expected. It is also noted that ground conditions may change over time, particularly groundwater quality.

The assessment provided is relevant to the intended development only and if a different development is planned, this report will need to be updated to reflect that land use.

2.0 SITE INFORMATION

2.1 SITE LOCATION

The location details are summarised in Table 2.1. The site location can be seen on Drawing A115249-LDN-N-CW-01.

Table 2.1 Site Location Details

Site Address	Campus West Car Park, The Campus, Welwyn Garden City AL8 6BX
Site Area	Approximately 2.3Ha
National Grid Reference	Approximately TL 23630 13392

2.2 SITE DESCRIPTION

The site is broadly rectangular in plan, with straight north, east and western boundaries, and a curved southern boundary defined by The Campus roadway.

At the time of the Tt investigation (during October to December 2019, reported in 2020), the east side of the site was occupied by the Campus West Arts & Conference Centre and the Welwyn Garden City Central Library. Hardstand parking for approximately 300 cars was located on the west side of the site, adjoining the access road connecting to The Campus.

The perimeter of the site is defined by landscaped areas with mature trees. The landscaping is broken along the south boundary by the access road and pedestrian entrance into the Art Centre.

The Campus West Arts & Conference Centre and the Welwyn Garden City Central Library buildings are flat roofed brick, circa 1980 buildings up to five storeys high occupying approximately 1/3 of the eastern site footprint.

The site layout can be seen on attached plan ref: A115249-LDN-N-CW-01.

2.3 GEOLOGY

The BGS Geological Maps (1:50,000 scale hard copies and 1:625,000 scale viewed from the BGS website) indicates that the site is underlain by the superficial Lowestoft Formation, described by the BGS lexicon of named rock units as "an extensive sheet of chalky till, together with outwash sands and gravels, silts and clays". The Lewes Nodular and Seaford Chalk Formations (undifferentiated) are indicated to underlie the superficial deposits.

The Lewes Nodular Chalk Formation is described in the BGS lexicon as “hard to very hard chalk with interbedded soft to medium chinks and marls. Nodular chinks are typically lumpy and iron-stained.” The Seaford Chalk Formation is described as “firm white chalk with nodular and tabular flint seams”. Together these units form part of the White Chalk Sub-Group and are herein referred to as the White Chalk.

The BGS geological online map shows that immediately to the north of the site the Lambeth Group is indicated to overlie the White Chalk. As these boundaries are inferred it is possible that this unit may encroach across the north boundary of the site. The BGS lexicon describes the Lambeth Group as “vertically and laterally variable sequences mainly of clay, some silty or sandy, with some sands and gravels, minor limestones and lignites and occasional sandstone and conglomerate”.

The results of the 2019/2020 WYG intrusive investigations broadly confirmed the anticipated geological conditions, although it should be noted that from surface (beneath hardstanding) the site is underlain by variable composition Made Ground. The Made Ground was variable and comprised both predominantly coarse and fine soils. A coarse 0.20 to 0.50m thick subbase layer was typically present below the hardstanding carpark areas. However, these were underlain by 0.20 to 0.60m of disturbed fine soils (which occurred from ground level in the landscaped areas). In places the Thanet Sand Formation was encountered above the White Chalk. For full details see A115249 Campus West Ground Investigation Report.

2.4 HYDROGEOLOGY

The groundwater vulnerability map indicates that the superficial deposits (Lowestoft Formation) are designated as a Secondary Undifferentiated Aquifer. The bedrock geology of the White Chalk has been classified as a Principal Aquifer.

The site is located within a Groundwater Source Protection Zone III. The 2019 data search within the previous report indicates no water abstraction permits have been identified within 250m of the site. The nearest water abstraction permit exists 474m east of the site, relating to Rank Xerox Ltd, which allows a daily rate of 2991m³ of groundwater to be abstracted daily for industrial processing.

2.5 HYDROLOGY

The nearest surface water feature is a stream located approximately 180m to the east of the site flowing east to west along the southern boundary of an area of residential properties. This stream is culverted below the pedestrian access leading into the Town Centre from Gresley Close. The eastern extent of the culvert, and the interface with any former railway drainage systems located north of the site and following the route of the stream, was not confirmed.

Unnamed streams also flow through wooded areas located 0.50km northwest of the site.

Further to the south of the site, two lakes are located in Stanborough Park in close proximity to the River Lea approximately 2.40km from the site boundary.

The EA interactive Flood Map (Environment Agency, Jan 2022), indicates that the site has been classified as being within an area designated as Flood Zone 1, which is defined as an area having a less than 1 in 1,000 annual probability of river or sea flooding.

2.6 HISTORICAL USES OF THE SITE AND SURROUNDS

The site history is summarised within the text below and can be seen in detail within the WYG site investigation report.

The earliest available historical map extract, published in 1884, shows the site to be part of the Sherrardspark Wood and is located immediately south of the Dunstable Branch railway. The wood was then cleared during the period from 1920 to 1940 prior to the establishment of a sawmill and joinery on the site. These developments were serviced by a rail siding feeding into the northern area of the site and included workmen's cottages in the southeast. The site was redeveloped to accommodate the library and Campus West buildings in 1973.

Google Earth Satellite Images / Aerial Photography dating back to 2002 show that the site has remained largely unchanged through this period to the present date (January 2022).

2.7 PREVIOUS REPORTS

Tt (formerly WYG) previously undertook a Ground Investigation Report on the site (A115249 Campus West – Ground Investigation Report, March 2020), which should be read in conjunction with this report.

The ground investigation physical works completed by WYG during December 2019 comprised the following:

- Service clearance using Ground Penetrating Radar and CAT Scanning and surveying using GPS of all exploratory locations.
- Hand excavated inspection pits to a depth of 1.20m bgl at all exploratory hole locations.
- 2No. Cable Percussive Boreholes to depths of 20.00m bgl (BH7) and 25.00m bgl (BH8) with Standard Penetration Testing (SPTs) and recovery of disturbed and undisturbed samples.
- 9No. Windowless sample Boreholes to depths ranging between 3.00 and 6.45m bgl with Standard Penetration Testing (SPTs) and recovery of disturbed samples.
- Installation of 50mm diameter dual-purpose Groundwater and ground gas standpipe monitoring installations; and
- 3No. ground gas monitoring and water sampling monitoring visits.

The investigation locations can be seen on: A115249-LDN-N-CW-02 Exploratory hole location plan.

In summary the results of the site investigation were as follows:

- Post field work groundwater monitoring recorded a groundwater rest level of between 15.87 (BH08) and 18.84m bgl (BH07) in the Lowestoft/ White Chalk and at 2.72m in WS14 on the final monitoring round (20/12/19) only. All other locations were recorded as dry.
- Gas results recorded Methane up to 0.3%, Carbon Dioxide up to 11.6% and flow maximum of -1.3L/hr.
- A total of 12No. soil samples collected from the site were submitted for laboratory analysis. pH was recorded as low (4.58-4.91) in 4no. shallow soil samples. Beryllium was recorded as slightly elevated in one location when considered against a residential without plant update end use. However, consideration of Beryllium concentrations against a public open space (parkland) end use screening value (considered an appropriate, albeit conservative approach, to a car park with limited managed soft landscaping), found they were not recorded in excess of the published screening criteria. No other contaminants tested were found to be in excess of the screening criteria.
- Groundwater was not encountered consistently across the site during monitoring rounds. No groundwater samples were retrieved during the investigation.

2.8 PROPOSED DEVELOPMENT

The site development is proposed to be the expansion and adaptation of the existing car park. This is to include the construction of new single storey suspended level parking deck, reorganisation of road and pavement arrangement, introduction of additional cycle parking, junction improvements and associated landscaping improvements. Details of the application are in planning application ref: 6/2021/2207/MAJ. The development will increase car parking spaces within the red line boundary from 334 to 490 (an uplift of 156). Of these, 30 of the bays will be disabled spaces, 21 of the bays will be parent and child spaces, and 10 of the bays will have electric vehicle charging facilities. In addition, the development will consist of improvements to the public realm, increased cycle parking and improved landscaping following the removal of some low-quality trees.

3.0 CONCEPTUAL SITE MODEL

3.1 INTRODUCTION

As part of the previously undertaken WYG Ground Investigation Report (A115249 Campus West – Ground Investigation Report, 2020), a preliminary conceptual site model was produced, in addition to a preliminary qualitative risk assessment. The conceptual site model is included within this section, in addition to a summary of the potential linkages to receptors risk assessment.

3.2 GENERAL

Under the current UK environmental legislation (Environment Act 1995, Water Resources Act 1994, Environmental Protection Act 1990 (as amended), Health and Safety at Work Act 1994, Town and Country Planning Act 1990 and Building Regulations 1985), land is defined as contaminated if there is a significant 'pollutant linkage'. This requires evidence of the presence of a contaminant "source", a "pathway" through which contaminants could travel, and a "receptor" that could be harmed by the contaminant. In addition, the type of receptor and any harm must meet the descriptions of significant harm given in the statutory guidance. A site where a contaminant is causing, or is likely to cause, significant pollution of controlled waters also constitutes contaminated land.

This section of the report presents an updated Conceptual Site Model (CSM), which includes a qualitative assessment of environmental risks associated with each of the pollutant linkages identified.

The qualitative risk assessment is achieved by classifying the likely significance or severity of the risk and the probability of the risk actually occurring, to determine an overall risk for that particular pollutant linkage. The assessment has been undertaken with cognisance of:

- The nature, volume and extent of any identified contamination source;
- The potential pathways;
- Identified primary receptors; and
- Due regard to the current site status

3.2.1. Summary of Potential Primary Ground Contamination Sources

Based on the review of available information and the ground conditions encountered during the WYG site investigation, no significant impact to the soils on site were identified. Within the site shallow soil pH was recorded at slightly acidic levels that may impact site receptors.

Landgas monitoring indicates the site to be Characteristic Situation 2 with Methane concentrations up to 0.3% and Carbon dioxide up to 11.6%. The flow rates measured at the site ranged between 0.7 and -1.3l/hr. These results are considered to be representative of a typical Made Ground and underlying Chalk.

3.2.2. Plausible Pollutant Pathways

The key environmental pathways and exposure routes by which potentially contaminative substances can reach environmental and human health receptors are considered to be:

- Dermal contact and ingestion of soil and soil derived dust; and
- Lateral and vertical transport of potentially mobile contaminants as dissolved phase (i.e. leaching through unsaturated strata or lateral transport through advective groundwater flow and/or diffusion which can be facilitated via service ducts and drainage infrastructure).
- Lateral/vertical transport of liquid products (i.e. under gravity via path of least resistance);
- Lateral and vertical migration of gases/vapours via advective flow or through diffusion;
- Atmospheric transport (and potential inhalation) of airborne dusts, vapours and fibres;
- Surface run-off;
- Chemical attack from aggressive contaminants;
- Plant uptake.

3.2.3. Receptors

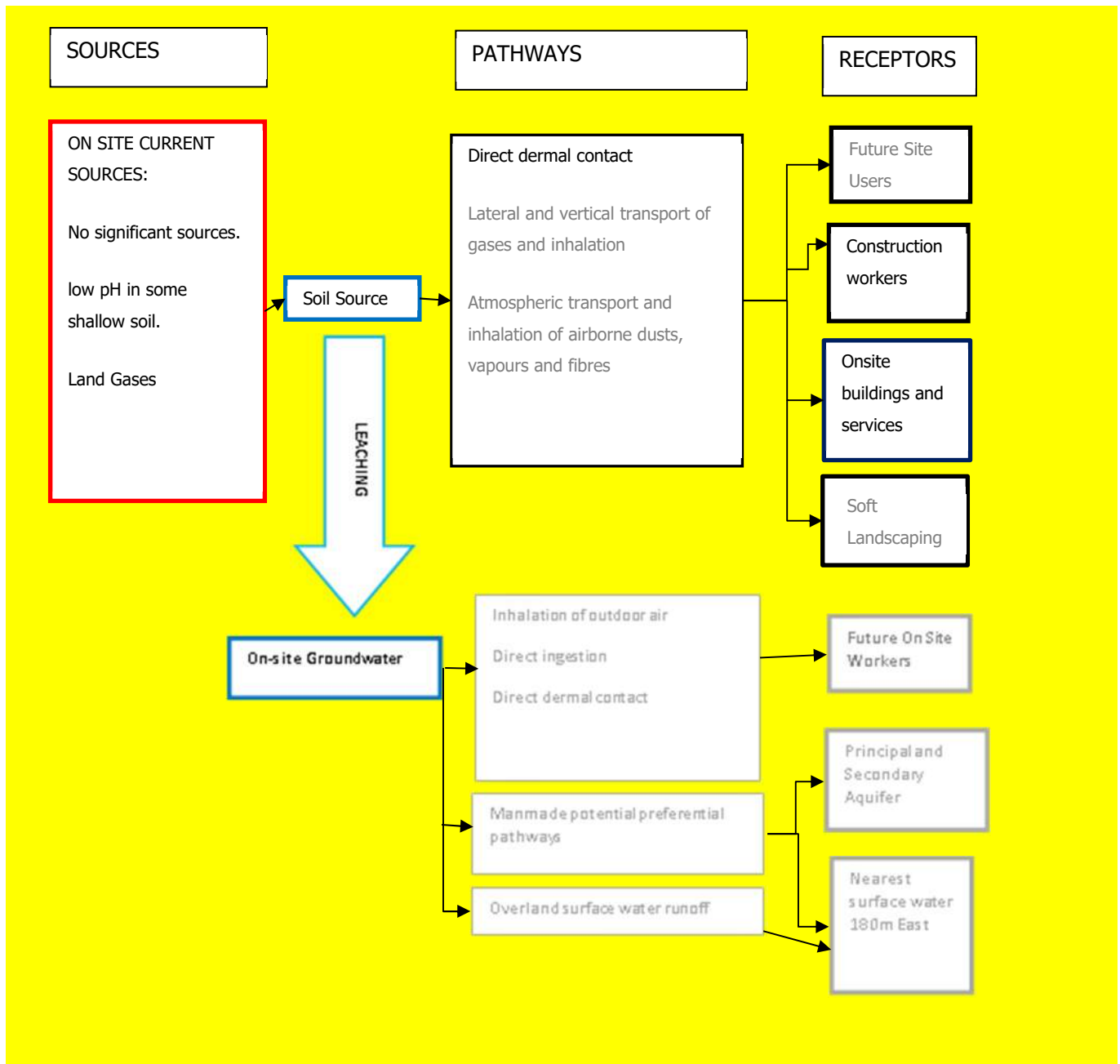
The primary environmental and human health receptors on or surrounding the site includes:

- Current Site Users ;
- Construction Workers;
- Future Site Users;
- Adjacent land Users (commercial, residential, industrial);
- Groundwater (Principal and Secondary Aquifers);
- Surface waters (including a stream located 180m E of the site);
- Building materials (concrete foundations and potable water pipes); and
- Soft Landscaping (areas of planting – trees and shrubs).

3.3 PLAUSIBLE POLLUTANT LINKAGES

Diagram 3.1 displays the current conceptual site model and demonstrates the key pollutant linkages considered to be present.

Diagram 3.1 Pre-Remediation Conceptual Site Model



*Greyed out text indicates source/pathway/receptor linkage is not a principal linkage.

3.4 SUMMARY OF PRINCIPAL POLLUTANT LINKAGES

Based on the review of ground investigation data the following risk levels have been identified:

- Future site users are considered to be at **LOW** risk from landgas ingress (assuming proposed car parking development is adequately vented against exhaust fumes and will therefore also not allow accumulation of landgas).
- Future site users are considered to be at **LOW to MODERATE** risk from direct contact with low pH soils in areas of proposed soft landscaping (hardstanding severs the pathway in other areas).
- Construction workers are considered to be **LOW to MODERATE** with the appropriate use of PPE and RPE.
- The risk to Groundwater is considered to be **MODERATE** (Unlikely but of a severe consequence). This conservative classification is cognisant of the groundwater depth which was beyond the scoped depth of the investigation, preventing the recovery of groundwater samples and associated laboratory assessment which has resulted in a relatively high degree of uncertainty. However, considering the significant depth beneath the site and lack of shallow sources of contamination identified in the made ground, the risk is reduced.
- Surface water considered to be at a **LOW to MODERATE** largely dependent on a well maintained and adequate drainage interceptor system of the car park.
- Onsite buildings and services are considered to be at a **LOW to MODERATE** risk from direct contact with low pH soils based on acidic soil conditions having the potential to degrade services.
- Proposed soft landscaping is considered to be at a **LOW** risk from direct contact with low pH soils. It has been assumed that future planting will include the import of a suitable growing medium / topsoil.

4.0 REMEDIATION STRATEGY

4.1 REMEDIATION APPROACH

The previous investigation did not identify the requirement for specific remedial measures with regards to the risk of soil contamination to human health or controlled water receptors. Although some constituents were identified, these were limited to pH and landgas, and the source-pathway-receptor linkage was considered to be incomplete due to various factors such as the extent of proposed hardstanding and type of proposed development (car park well ventilated for exhaust fumes).

The primary principle that will underpin the remedial scheme will be to effectively address the identified pollutant linkages, or points of concern, for which there are recommended mitigation measures. The works will be undertaken in such a manner as to minimise any potential impact to the surrounding environment during the works. It is considered that the remedial scheme will contain the following key elements:

4.1.1. Reactive Strategy

No specific targeted soil or groundwater remediation is considered to be required to address risks to either human health or controlled water receptors. However, unexpected soil conditions may be uncovered during the process of ground excavations during construction. Should impacted soils or groundwater be encountered, e.g., materials or soils exhibiting visual or olfactory evidence of impact, the associated works or excavations should cease within the affected location and the opinion of a suitably qualified Contaminated Land Consultant should be sought immediately. The Local Authority should be notified in writing upon discovery of unexpected contamination. Evidence of possible visual contamination may include fibrous materials, oddly coloured soils, or those with oily sheens. In addition, potential olfactory evidence may include as chemical or hydrocarbon malodours.

Construction workers should be briefed on being vigilant and reporting any potentially contaminated or suspicious materials they encounter on site. If any are uncovered, it will be necessary to take measures to minimise the mobilisation or re-distribute of impacted materials until appropriate controls are in place.

If impacted soils/groundwater are encountered, subject to any additional health and safety requirements being addressed in the first instance (e.g. refer to Section 6), the Local Planning Authority must be informed in writing immediately.

If impacted soils/groundwater are encountered, the Contaminated Land Consultant is likely to recommend sampling of the affected area following by laboratory testing to confirm the visual observations, the quality of the soils/groundwater and the extent of the impact. A revised semi-quantitative risk assessment may be necessary to inform this decision. A revised remediation strategy including the following components, as detailed in planning condition 6, to deal with the risks associated with unexpected contamination of the site

shall each be submitted to and approved, in writing, by the local planning authority. In summary the scheme is to include:

- Preliminary risk assessment (including potential contaminants);
- Additional Site Investigation scheme and results;
- Updated Risk Assessment and remedial measures required;
- Remediation objectives and criteria;
- Updated conceptual site model;
- Timetable of works and site management procedures;
- Verification Plan.

Any impacted soils/groundwater that are encountered may require remediation such as excavation and removal from site for disposal at a licensed waste facility or treatment facility (if proven to pose a potential risk to either controlled waters, human health or development infrastructure).

4.1.2. Asbestos

No asbestos fibres were detected during the site investigation. However, considering the brownfield nature of the site, it would be prudent for Construction workers to be trained to look out for suspected asbestos containing materials and have appropriate PPE/RPE available to use if required.

4.1.3. Proposed Landscaped Areas

Within the ground investigation report, Made Ground/fill materials were recorded across much of the site. No exceedances of the relevant screening values protective of human health (public open space or commercial/industrial values) were recorded within the shallow soil.

Proposed soft landscaped areas will require the importation of clean topsoil materials to provide a suitable growing medium for plants, as soils with inadequate textural quality were encountered on site. This topsoil will also create a greater physical separation between surface infiltration and underlying poorer quality soils, depending on finished levels on site a degree of excavation of site soils maybe required to accommodate the imported clean topsoil.

The minimal soil cover depths are to be agreed with the landscape architect but are likely to be as follows:

- A minimum of 200mm capping layer (to comprise topsoil and subsoil).

Chemical certification should be obtained from the supplier for all Topsoil material to be imported, prior to obtaining such materials, at a rate of one analysis per 250m³ imported or one per source, whichever is greater. Any materials not meeting the standards should be rejected and must not be used on site, unless justified.

Site derived materials may be used within the Cover Layer provided they meet the following chemical criteria below:

Table 1: Chemical acceptability limits for imported materials for use as the Cover Layer

Determinant	Soil Criteria (mg/kg)- Tt TSV for Public Open Spaces (Ref: WYG TSV POS park v17-20.02.22)
pH	5.0 – 9.0
Asbestos	None Quantifiable
Arsenic	<170
Chromium (VI)	< 250
Copper	<44,000
Free Cyanide	< 24
Lead	< 1300
Mercury (elemental)	< 25.8
Nickel	< 800
Zinc	< 170,000
Benzo(a)Pyrene	< 21
Naphthalene	< 76.4
Phenol	< 440
Benzene	< 190

Notes:

1. Specific asbestos laboratory screening should be undertaken on all samples tested for other contaminants, plus visual inspection of material on site.
2. All samples shall be collected by appropriately trained personnel, with full details of the location, depth, date and time of sampling.
3. Strict Quality Control procedures shall be observed at all times.

The Contractor will be responsible for obtaining details of the sources of materials and for determining that such materials comply with the acceptable chemical limits indicated in Table 1 above. The Contractor will check each source and secure representative sampling and testing to show its suitability for use. Copies of all test data and haulage records shall be maintained by the Contractor and information from them included within the completion report data.

The Contractor is responsible for carrying out chemical testing of the materials imported to site for use in the Cover Layer. The frequency of sampling and testing shall be sufficient to establish the quantity and variability of the material. The Contractor should provide a minimum of 1 sample and associated testing per 250m³ of imported natural material. Materials imported to site shall be classified using composite sampling techniques and there shall be a minimum of 3 samples per source.

The Contractor shall not solely rely on test data provided by the supplier of the soil materials proposed for use in the cover layer, but such data may be used as secondary lines of evidence to demonstrate compliance with this specification.

Landscape architects should be informed of the ground conditions in order to select plants appropriately.

4.1.4. Construction Workers

As noted within the Conceptual Site Model, the overall risk to construction workers was considered to be moderate, although this may be mitigated to be of a low to moderate order by a number of measures outlined below.

Construction workers on site will need to wear PPE (including gloves) at all times on the work site.

Construction workers need to be made aware, via toolbox talks and site briefings of the potential of uncovering contamination. If gross asbestos is uncovered the HSE will need to be notified.

Groundworkers should be provided with suitable personal protective equipment (PPE - including gloves and disposable coveralls etc.) in addition to changing and washing facilities with good hygiene employed.

Furthermore, it is recommended that stockpiles of soils and excavated materials stored on site are managed (covered or damped down as required) as a precaution to reduce dust generation.

4.1.5. Potable Water Pipes and Chemical Attack on Buried Concrete

Buried plastics used for potable water supplies may require upgrading in order to resist chemical attack. It is recommended that the local water utility company is consulted to confirm requirements.

Consideration of the pH recorded in site soils should be given when ascertaining concrete class.

Should upgraded materials be required, confirmation should be retained that such materials have been installed with the agreement of the local water utility, and such documentation should form part of the verification report.

5.0 ADDITIONAL CONSIDERATIONS

Although the following aspects are outside the scope of this Remediation Strategy Report, it is recommended that they are considered.

5.1.1. Unexploded Ordnance (UXO)

Regional Unexploded Bomb Risk mapping (by Zetica) indicates that site is in a low risk area. As such, specific mitigation requirements and/or safety precautions for UXO risks are not anticipated to be required. However, further consideration of these risks should be detailed within the site-specific health and safety management plans.

5.1.2. Ecological Constraints

Any ecological constraints should be addressed ahead of any works on the site by a qualified Ecologist. Ecological sensitivities should be confirmed and where necessary appropriate mitigation should be followed to enable the works to progress.

5.1.3. Site Security

It is recommended that the security of the site is considered during future site works in order to reduce the risk of trespass and the possibility of fly tipping or other such problematic activities.

5.1.4. Materials Management Plan

If any excavated materials from the development works (e.g. surplus arisings from foundations, re-grading levels etc) are to be retained for beneficial use on site (e.g. to manage site levels, create bunds etc), a Materials Management Plan will be prepared and agreed with the Environment Agency and subject to review and agreement by a Qualified Person in advance of the works. Such soils will need to be proven that they are of suitable chemical and geotechnical quality for the use intended and will not present a new pollutant linkage.

6.0 VERIFICATION STRATEGY

If unexpected contamination is uncovered during construction, independent validation of the works will be undertaken by a suitably qualified contaminated land consultant. The consultant will oversee key stages of the works, including but not limited to; excavation of key areas, laying of imported topsoil for soft landscaping. If unexpected contamination is uncovered during the works, the works will be halted the advice of the consultant has been sought to advise on the way forwards. Upon completion of the remediation works, a validation / completion report will be produced presenting the completed remediation works and environmental monitoring and testing, to show how the site remediation objectives were achieved and the assessed risks practically reduced.

The verification strategy will use a Multiple Lines of Evidence approach as per the Environment Agency guidance on Verification of Remediation. As a minimum the following type of information will be collated to demonstrate the effectiveness of the remediation and improvement of the land asset:

- Scope of remediation/mitigation works;
- Excavation volumes and fate/destination;
- Details of inspections and verification by Suitably Qualified Person;
- Variations to remediation approach during works (if any);
- Waste transfer notes & landfill receipts;
- Licence, consent and regulatory details;
- Details and confirmation of approval and installation of potable water pipe specification;
- Photographs;
- Laboratory test data from supplier for imported topsoil and evidence (e.g., photographs) of depths of clean soils placed in landscape beds;
- Contractor inspection sheets of general earthworks confirming the absence or otherwise of gross contamination in general earthworks and any further actions;
- Details of any 'unexpected' contaminated soils/groundwater that were removed under the 'reactive strategy' including volumes, laboratory test results, any treatment undertaken, fate of the materials and test results from the resulting void to confirm that the full extent of impacted soils were removed;
- Detailed records of any contaminated/hazardous materials that remain in situ on site at the completion of the works. Records detailing the location, depth and extent of such soils, methods used to prevent

escape of such materials (e.g. encapsulation, membranes (including specification of such), warning system to alert of its presence);

- Environmental monitoring records (refer to Section 7.0); and
- Other contractor inspections.

7.0 ENVIRONMENTAL MONITORING & CONTROLS

7.1 GENERAL

Contractors involved with the groundworks will carry out the duties of the Principal Contractor in accordance with the CDM Regulations (as current at the time of the works or a replacement system) and will further develop a Construction Phase Health and Safety Plan including all site-specific method statements and a risk assessment / COSHH assessment specific to this remediation scheme. Works will not proceed until various parties and regulatory bodies have confirmed that they are satisfied with the Construction Phase Health and Safety Plan. A summary of some key aspects of this are provided in the following sections.

A Construction Environmental Management Plan (CEMP) will be produced ahead of the works detailing the scope and methodology of the environmental monitoring and mitigation to be implemented.

The key areas for protection are the groundwater environment and the atmosphere. The key receptors to release of any emissions from site during the works are considered to be the onsite construction workers, adjoining site users/occupants (residential occupants to the west, commercial to the east and landscaped/wooded areas to the north and south), the underlying Secondary Aquifer and the deeper Principal Aquifer.

7.2 SITE SET UP – GENERAL REQUIREMENTS

Induction programmes for contractors and site visitors will be implemented and all site operatives will have the appropriate level of Personal Protective Equipment (PPE). Site workers will be referred to the Reactive Strategy and made aware of their associated responsibilities via Toolbox Talks and daily site briefings.

To protect the underlying groundwater from uncontrolled run-off precautions will be taken and include:

- Site soil arisings should be stockpiled on hardstanding within a bunded area and covered.
- Fuel used on site should be stored within double skinned tanks within an adequate bund.
- Spill kits should be available on site.

To be protective of human health the following precautions should be made:

- Appropriate PPE/RPE should be provided and used (to include gloves).
- Warm water and hand washing facilities provided.
- No smoking or eating within the working site area to minimise transference of soil from hands to face and mouth.

7.2.1.Dust, Odours and Vapours

Monitoring during site works for Dust, Odours and Vapours is not considered strictly necessary based on the investigation findings to date on the site. However, the Reactive Strategy should be followed and the

requirement for such monitoring may be necessary should unexpected contamination be encountered during works. It should be noted that such monitoring may be required by the Local Authority as a matter of course to prevent nuisance to neighbours and therefore confirmation should be sought in this respect in sufficient time ahead of proposed future works.

7.2.2.Noise and Vibration Monitoring

Monitoring of noise and vibration may be required during the construction works and the details of this will be described in the Construction Environmental Management Plan (CEMP) with monitoring locations identified for the works where necessary. Confirmation of such requirements should be sought from the Local Authority and a Section 61 Consent may be required for the works.

Best practical means to minimise noise and vibration caused by operations, having regard to the recommendations in BS 5228-1: 2009 '*Code of Practice for Noise and vibration control on construction and open sites*'. Examples of noise minimisation measures may include the use of noise screens, limiting the amount of plant working at any time and silencing of plant.

7.2.3.Mud Control

Controls should be implemented to prevent the spread of mud/dust and associated run-off into drainage systems and onto roadways and adjoining properties. It is recommended that a wheel wash located at the exit of the site is available and utilised if required. Vehicles that have tracked over soft standing should be directed over this wheel wash if required and not be allowed to bypass it. Further details of mud control, including road cleaning measures, will be detailed in the CEMP.

7.2.4.Chemical Audit Procedure

COSHH statements will be available onsite for all chemicals/materials used/stored onsite. Any spillages will be appropriately dealt with under a site-specific Incident Response Plan.

7.2.5.Health and Safety

The proposed mitigation works will be undertaken in line with good industry practice utilising appropriate site set up and environmental control facilities based on Health & Safety Executive guidance document HSG66. These measures are related to the ground works construction activities, when exposure to contaminants is greatest.

Induction programmes for contractors and site visitors will be implemented and all site operatives will have the appropriate level of Personal Protective Equipment (PPE) to include boots, gloves and eye protection.

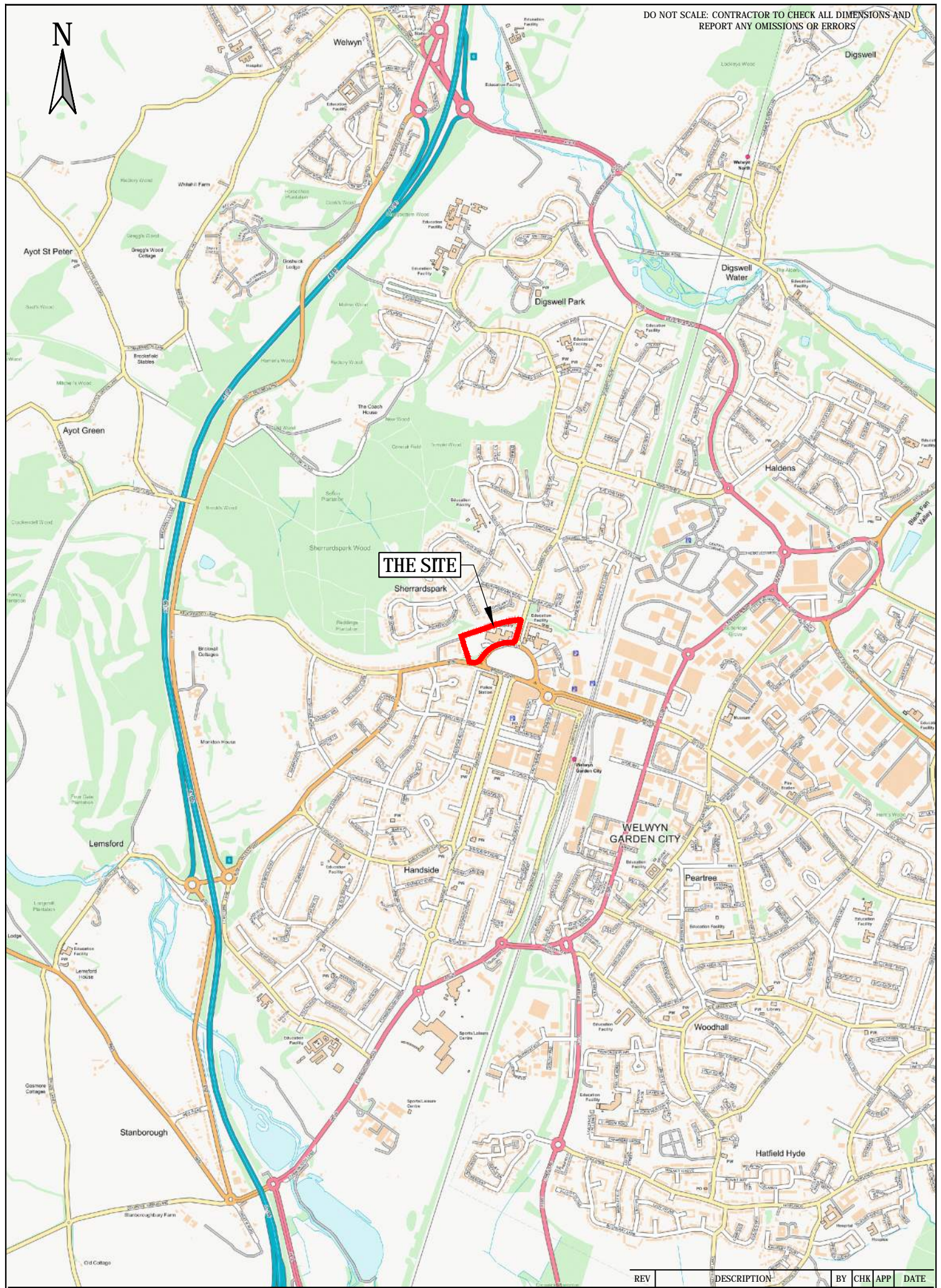
8.0 OUTLINE SUMMARY TIMETABLE OF WORKS

Based on the Contractor 's preliminary High Level Programme of works included within Appendix B, the following key dates of construction works are highlighted below:

- Site Mobilisation and Set up - End of March 2022
- Groundworks - April-July 2022
- Soft Landscaping -October-November 2022
- Demobilisation from site -November 2022

Appendix A – Drawings

DO NOT SCALE: CONTRACTOR TO CHECK ALL DIMENSIONS AND REPORT ANY OMISSIONS OR ERRORS



THE SITE

Sherrardspark

WELWYN GARDEN CITY

REV	DESCRIPTION	BY	CHK	APP	DATE

3 SOVEREIGN SQUARE
SOVEREIGN STREET
LEEDS
WEST YORKSHIRE
LS1 4ER
TEL: +44 (0)113 278 7111
e-mail: leeds@wyg.com



Client:
**WELWYN HATFIELD
BOROUGH COUNCIL**

Project: A115249
WGC CAMPUS WEST

Drawing Title:
SITE LOCATION PLAN

Scale @ A4 1:20,000	Drawn CM	Date 17.01.20	Checked Date	Approved Date
Project No. A115249	Office LDN	Type N	Drawing No. CW/01	Revision



KEY

- SITE BOUNDARY
- ⊕ CABLE PERCUSSION BOREHOLE
- ⊙ WINDOW SAMPLE
- ⊗ CONE PENETRATION TEST / PLATE LOAD TEST
- ⊙ PLATE LOAD TEST
- ▶ MONITORING INSTALLATION



REV	DESCRIPTION	BY	CHK	APP	DATE
Client: WELWYN HATFIELD BOROUGH COUNCIL					

Client: WELWYN HATFIELD BOROUGH COUNCIL

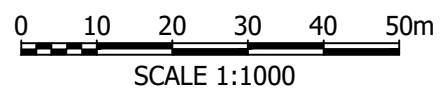
11th FLOOR
1 ANGEL COURT
LONDON
EC2R 7HJ



TEL: +44 (0)20 7250 7500
e-mail: london@wyg.com

Project: A115249
WGC CAMPUS WEST

Drawing Title:
EXPLORTORY HOLE LOCATION PLAN



Scale @	A3	Drawn	Date	Checked	Date	Approved	Date
1:1,000		CM	17.01.20				
Project No.	Office	Type	Drawing No.	Revision			
A115249	LDN	N	CW/02				

Appendix B – High Level Programme of Works

6409 Campus West MSCP, Welwyn Garden City High Level Main Works Programme 10.12.2021

