

SITE AT 88 SCHOOL LANE DIDSBURY MANCHESTER



KAMANI PROPERTY GROUP REMEDIATION STRATEGY

Report Reference: 1338-005-001

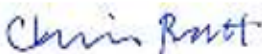
Date of Issue: 26/11/2020



Document Verification

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Signatures and Approvals

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Document History

Report Reference	Issued	Description/Amendment
1338-005-001	26/11/2020	First Issue

Executive Summary

The Site	The site is approximately 27m by 29m in plan and has an area of approximately 0.07 ha (783 m²). The site is located at 88 School Lane in the Manchester suburb of Didsbury, centred at National Grid reference 385156, 391114. Planning permission has been granted to develop the site with two to three-storey residential properties with associated car parking, hardstanding and garden areas.
Remediation Objectives & Verification	A Phase 1 Desk Study, Phase 2 Ground Investigation (GI), programme of gas monitoring and post-demolition sampling have already been completed for this site. Potential contaminants have been quantified by chemical testing and the results compared to Generic Assessment Criteria (GAC). Contamination risks are generally low and below the GAC. There is considered to be a low to moderate risk relating to PVC/PE water supply pipes and a low to moderate risk regarding the potential for unforeseen contamination in areas of the site that were not investigated during the GI. Management of these residual contamination risks is set out within this Remediation Strategy along with validation requirements. Residual contamination risks will be lowered or removed completely by following the recommendations of this Remediation Strategy. The following Remediation Objectives have therefore been set to manage potential risks: 1. Maintain a watching brief during the development process. 2. Appropriate management of Made Ground. 3. Liaison with the public water supplier regarding potable water supply piping. 4. Appropriate design of below ground concrete. 5. Validation of imported topsoil for landscaped areas. The Principal Contractor is responsible for ensuring that the above objectives are actioned during the construction works. An independent consultant, such as Westlakes, should be engaged by the Principal Contractor to verify that the works have been completed in accordance with this Remediation Strategy. Validation records should be passed to the Local Authority to enable the discharge of related planning conditions.
Conclusion	Residual contamination risks are considered to be low and low to moderate. The site does not require remediation given the very low levels of encountered contaminants. However, there are residual contamination risks, and this Remediation Strategy considers how these risks can be managed to reduce and remove the residual risks. Consideration should be given to the potential for unforeseen contamination in areas of the site that were not previously investigated, the management of Made Ground, the selection of potable water supply pipes, sulphate protection for below ground concrete and to the formation of garden areas, as discussed within this Remediation Strategy. A garden capping layer is not required; however, topsoil will need imported to form a suitable growth medium for plants in gardens. There is no existing topsoil on site.



A minimum thickness of 150mm of imported topsoil is recommended for gardens.

Topsoil can be placed over the existing soils. The underlying soils should be dug over prior to placement of the topsoil to improve their drainage characteristics, as they may have become compacted during the construction works. This will also allow for inspection of the existing soils, which have already been tested and are considered to be chemically suitable to remain on site. The soils also need to be physically suitable for use in a garden area and therefore they should be inspected by the groundworker. Any obviously unsuitable materials, such as construction rubbish/debris, whole bricks or glass (if present), should be removed prior to placement of the topsoil.

Remediation Objectives have been set to manage residual contamination risks, which will need to be validated as the development progresses.



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Appendices

- 1- Site Location Plan**
- 2- Proposed Future Site Layout**
- 3- Generic Assessment Criteria**

1 Supporting Documents & Discussion

1.1 Introduction

Westlakes Environmental, as a division of Westlakes Engineering Limited, has been commissioned by the Kamani Property Group to produce a Remediation Strategy for a 0.07 ha (783 m²) site, located at 88 School Lane in the Manchester suburb of Didsbury, centred at National Grid reference 385156, 391114.

A site location plan is included in Appendix 1 of this report.

In 2018 planning permission (ref 121011/FO/2018) was granted by Manchester City Council (MCC) to redevelop the site for residential use via removal of former building and construction of a part2/part3 storey terrace of four dwellings and one 2 storey detached dwelling with external areas for parking and gardens.

MCC confirmed in their letter referenced CDN/20/0087 and dated 07/02/2020 that "Planning Condition 4 – Contaminated Land" has been partially discharged. However, MCC noted that a Remediation Strategy will need to be submitted to fully discharge the condition.

The following documents have already been produced for the site by Westlakes:

- Phase 1 Geo-environmental Desk Study report (ref. 1338-001-001).
- Phase 2 Ground Investigation (GI) report (ref 1338-002-001).
- Ground Gas Monitoring Addendum (ref 1338-003-001).
- Post Demolition Sampling (ref 1338-004-001).

This Remediation Strategy is based on the information presented in the above reports and should be read in conjunction with them. All these reports should be forwarded to the Environmental Protection department of MCC, to assist in the discharge of related planning conditions.

An initial conceptual site model (CSM) was developed during the Desk Study. This was refined following intrusive GI, completion of a programme of gas monitoring and updated after completion of post demolition sampling. The latest CSM is presented in Section 2, and takes into account the proposed site end use, site specific information, the findings of GI including chemical test results on soils and gas monitoring.

Remediation Strategy objectives are considered in Section 3 and Validation requirements in Section 4.

1.2 Existing Site Description

The site was previously occupied by a disused two-storey commercial building in the northern part of the site, with a yard and two garage buildings in the southern part of the site. Hardstanding to the front and rear of the property comprised concrete and concrete paving slabs. Former buildings have been demolished.

The plan in Appendix 1 shows the site location, intrusive GI locations, the former building outline and the development area footprint.

To the north is School Lane and to the west is Ladysmith Road, with residential properties beyond. The immediate vicinity is used mainly for residential purposes with some commercial properties.

The nearest surface water course is the River Mersey, located approximately 1km to the southwest of the site. The Ordnance Survey Master Map Water Network data included in the Groundsure report details two drains of limited extent at 442m and 490m to the east.

There are no licenced surface water abstractions or recorded discharge consents within 500m of the site.

1.3 Development Plans

As discussed in Section 1.1, this is a residential development with garden areas. The plan in Appendix 2 shows the proposed future site layout, which includes gardens towards the rear of the properties.

Construction activities and formation of garden areas may result in excess arisings, which would require off-site disposal. For example, excavations into the natural ground to form the building foundations as discussed in the geotechnical section of the GI report.

1.4 Historical Context

Historically the site was agricultural land until the 1920s/1930s, when it was developed as a commercial property, similar to the previous layout, prior to demolition and recent site clearance. The site was considered likely to contain Made Ground which was identified as the main potential source of contamination, which was considered within the initial Conceptual Site Model (CSM).

Historical maps show the surrounding area has been progressively developed, although many of the buildings in the immediate vicinity have remained unchanged. The surrounding area is mainly residential. Potential contaminative land uses in the surrounding area do not appear to be present and therefore surrounding land uses were not identified as potential sources of contamination.

On-site land uses may have had the potential to influence the contamination status of the site and consequently intrusive GI has been undertaken to quantify potential contamination risks.

1.5 GI Summary

GI was undertaken in June 2019, followed by gas monitoring between August to October 2019, and then post demolition sampling in October 2020. The intrusive works are summarised here:

- 3 window sample boreholes (WS1 to WS4) drilled to a maximum depth of 5m bgl.
- Geotechnical testing was completed to determine the geotechnical ground properties.
- WS1 to WS3 were reinstated as gas monitoring wells to enable subsequent monitoring.
- 6 ground gas monitoring visits were completed over a 3 month period.
- 3 trial pits (TP1 to TP3) were excavated post demolition in October 2020.
- Contamination testing including leachate tests were undertaken to determine concentrations of potential contaminants associated with the site history as set out within the CSM.

1.6 Ground Conditions

The encountered ground conditions are summarised here:

- Made Ground was encountered across the site from ground level to a minimum depth of 0.3m bgl and to a maximum depth of 0.6m bgl. Typically a 0.5m thickness of Made Ground was encountered.
- Beneath the Made Ground, Glaciofluvial deposits were encountered, extending to depths of 3.2m to 3.6m bgl. These deposits were light brown to orange gravelly sand which was sometimes noted to be slightly clayey and slightly silty.
- Glacial Till was encountered in the WS locations, from depths of 3.2m to 3.6m bgl to the maximum drilled depth of 5m bgl. The Glacial Till was encountered as a firm brown sandy clay.
- Bedrock has not been encountered but geological mapping suggests that the site is underlain by sandstone bedrock of the Wilmslow Sandstone Formation and the Chester Pebble Beds Formation.
- Groundwater was encountered during the GI within the Glaciofluvial deposits at depths of approximately 2.8m to 2.9m bgl.



- Groundwater monitoring detected shallow groundwater at depths of 2.07m to 2.50m bgl.

1.7 Gas Risk

The site is in a lower probability radon area and therefore radon protective measures are not required.

The closest historical landfill site is 901m to the southwest for inert, industrial, commercial, household, special and liquid sludge waste at Parrs Wood Road between 1947 and 1976.

There are no current registered landfill sites within 1km of the site.

Therefore, the only potential source of ground gas identified for the site is the Made Ground, or any organic material if present within the underlying natural soils.

No putrescible material / biodegradable material was encountered during the GI.

There are limited potential sources of ground gas. However due to the presence of on-site Made Ground, the potential risk from ground gases was quantified via a programme of ground gas monitoring.

The monitoring programme consisted of 6 visits which were undertaken over a range of atmospheric pressure conditions, varying from 1004mb to 1022mb. During each visit carbon dioxide, methane and oxygen concentrations, flow rate and groundwater levels were recorded. The results fall within CIRIA C665 Classification of Characteristic Situation 1 (CS1) where gas protective measures are not required.

1.8 Chemical Testing

Five Made Ground samples and 4 natural ground samples were scheduled for chemical analysis for a range of potential contaminants as identified within the CSM. In addition, 1 Made Ground sample underwent leachate analysis. Two samples of Made Ground and 1 sample of natural ground also underwent Waste Acceptance Criteria (WAC) testing.

Asbestos was not identified within any of the samples.

The test results were all below the Generic Assessment Criteria (GAC) for a residential with plant uptake end use, except for one very minor elevation of dibenz(a,h)anthracene (0.31 mg/kg, Soil Organic Matter (SOM) content of 3.2%), compared to the GAC of 0.28 mg/kg (2.5% SOM) and 0.3 mg/kg (6% SOM). This very minor elevation is considered to be insignificant and all other samples were below the GAC.

It is therefore concluded that the risks to human health are very low. A capping layer is not required within garden areas, although topsoil will need to be imported as there is none on site.

Leachate results were also below their respective GAC exception for one elevation of 7 µg/l which was recorded in Made Ground relative to the EQS Freshwater GAC for copper of 1 µg/l. This is however well below the GAC Drinking Water Standard for copper of 2,000 µg/l.

The site contained up to 0.6m thickness of surface Made Ground over around 3m of Glaciofluvial sand (Secondary A Aquifer) over at least 1.5m of Glacial Till (clay), which is typically unproductive strata. The Environment Agency defines unproductive strata as low permeability deposits that have negligible significance for water supply or river base flow. Sandstone bedrock is expected to be present at depth and is classed as a Principal Aquifer.

Post-development many parts of the site would be covered by buildings or hardstanding which will limit the possibility of downward infiltration of rainwater through remaining Made Ground.

The nearest surface water course is the River Mersey, located approximately 1km to the southwest of the site. There are no licenced surface water abstractions or recorded discharge consents within 500m of the site.

Consider the above, the risks to controlled waters appear to be low.



WAC testing indicates that the natural ground is inert for landfill classification. The Made Ground may also be inert however it could also fall within the Stable Non-Reactive Hazardous Waste (SNRHW) landfill classification due to a single elevation of sulphate when compared to the inert limits.

Some PAH results were also above the UKWIR thresholds for PE and PVC potable water supply pipes, consequently alternative types of potable water supply pipes may be required.

Below ground concrete will need to incorporate sulphate resistance, where the concrete is in contact with the existing Made Ground. Results for the natural ground were within the DS1:AC1 classification. However, an appropriate classification for below ground concrete in contact with the Made Ground would be DS3:AC3, based on the mean of the highest two results.

1.9 Summary

The site does not require remediation given the very low levels of encountered contaminants. However, there are residual risks, which are presented in the risk assessment in Section 2, and this Remediation Strategy considers how these risks can be managed to reduce and remove the residual risks.

2 Risk Assessment

The site's CSM is presented below, showing source-pathway-receptor 'contaminant linkages' potentially present at the site, along with a qualitative assessment of each pollutant linkage. Contamination risks without any action are considered to be very low to moderate and these potential risks will be lowered/removed by following the Remediation Strategy recommendations.

Source	Pathway	Receptor	Probability	Consequence	Residual Risk (with no action - then site-specific considerations for reduction or removal of residual risk)
Elevated PAHs within Made Ground compared to PE and PVC drinking water pipes	Direct contact	PVC and PE potable water supply pipes/human health	Low	Medium	Moderate/Low - Risk removed by appropriate potable water pipe selection
Elevated sulphates in Made Ground	Direct contact, migration through ground	Below ground concrete	Low	Mild	Low - Risk removed by appropriate concrete selection
Potential for unforeseen contamination in areas of site not investigated	Ingestion, inhalation, dermal contact	Humans: future site users, visitors and construction workers	Low	Medium	Moderate/Low – Risk reduced/removed by following watching brief. Risk to future occupants removed by new buildings or hardstanding and reduced by topsoil in gardens. Risks to construction workers reduced/removed by good hygiene and working practices and appropriate PPE
Potential for unforeseen contamination in areas of site not investigated	Migration through the ground	Underlying aquifers	Low	Medium	Moderate/Low – Risk reduced/removed by following watching brief.



Potential for unforeseen contamination in areas of site not investigated	Direct uptake from soil	Vegetation	Low	Minor	Moderate/Low – Risk reduced/removed by following watching brief and by placement of topsoil in gardens. Imported topsoil to be tested to confirm suitability.
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3 Remediation Objectives

Purpose: To address potential residual contaminant linkages and to facilitate successful site development where human health (future site users and construction workers), controlled waters (groundwater/underlying aquifers), below ground concrete, the general environment/ecology and plant health (plants within landscaped areas) are protected from possible contamination risks.

Potential contaminants have been quantified by chemical testing and the results compared to GAC. Contamination risks are generally low and below the GAC. There is a low to moderate risk relating to PVC/PE water supply pipes. There is also a low to moderate risk regarding the potential for unforeseen contamination in areas of the site that were not investigated during the GI. Management of these residual contamination risks is set out within this Remediation Strategy along with validation requirements.

The following remediation objectives have therefore been identified:

1. Maintain a watching brief during the development process.
2. Appropriate management of Made Ground
3. Liaison with the public water supplier regarding potable water supply piping.
4. Appropriate design of below ground concrete
5. Validation of imported topsoil for landscaped areas.

Each remediation objective is discussed in detail in the following subsections.

The Principal Contractor is responsible for ensuring that the above objectives are actioned during the construction works. An independent consultant, such as Westlakes, should be engaged by the Principal Contractor to verify that the works have been completed in accordance with this Remediation Strategy.

3.1 Watching Brief Working Method

Due to the unpredictable nature of ground and groundwater conditions, it is possible that localised zones of contaminated material may be found on-site in areas that were not covered by the ground investigation. A watching brief working method has therefore been developed to assist management of the residual risks:

- All site workers should keep a watching brief to look out for possible signs of contamination during the construction process. The Principal Contractor should inform site workers that localized zones of contaminated material may be found on-site, and if so, the precautions to be taken.
- Construction workers should be protected from exposure to unforeseen contamination risks. Appropriate working practices should be adhered to, including use of appropriate personal protective equipment (PPE), including FFP3 category face masks where asbestos is suspected, and adopt good hygiene practices to prevent unnecessary exposure to made or potentially contaminated ground.
- If contamination is suspected, then the discovery strategy below should be followed.
- If oily, ashy, odorous or apparently contaminated material (including discovery of suspected Asbestos Containing Materials) is found, then Westlakes should also be informed immediately by the Principal Contractor, and a suitably qualified and experienced person will attend site and determine what action is required. The Environmental Health Department of the Local Authority should also be informed. Samples of the material should be tested under Westlakes' direction to assess if the material is 'contaminated'. The testing regime will be selected depending on the suspected source of possible contamination, and the number of samples determined by the area of contamination. As a minimum two soil samples should be taken and tested.

- Results of the testing should be compared with GAC, similar to those listed in Appendix 3, which are for a residential end use. If the results are below these values, then no further action is required.
- If the results are above the GAC, then further risk assessment or testing may be required to understand the risk. This work should be undertaken by an appropriately qualified and experienced person. If the material is found to be 'contaminated' and therefore unsuitable to remain in its present circumstance, after consultation with the Environmental Health Department of the Local Authority, then the material should be removed, treated or capped as appropriate.

Verification: If unexpected contamination is encountered then this should be documented as discussed above. The Principal Contractor should confirm to the independent consultant via email the outcome of the Watching Brief. These records should be passed to the Local Authority as part of a Verification report.

3.2 Appropriate Management of Made Ground

Arisings from the site are not expected to be contaminated. Two Made Ground samples underwent WAC testing during the post demolition sampling and were classified as inert or SNRHW. One sample of natural ground also underwent WAC analysis, and the results were within the inert classification.

- Made Ground can remain on site and formation of garden areas is considered in Section 3.5.
- Remaining Made Ground will be sealed beneath the building footprint or hardstanding, separating it from future site users, and limiting infiltration, percolation and leaching potential.
- The contractor's risk assessment and method statement and subsequent working practices should account for unforeseen contamination, including following the Watching Brief and discovery strategy set out in Section 3.1.
- The public should also be protected as part of the contractors' safe working practices which should include dampening down during the disturbance of Made Ground to mitigate the generation of dust.
- Excess arisings may either be used to raise ground levels as required or alternatively should be appropriately classified and removed from site by a registered waste carrier in accordance with the waste "Duty of Care requirements" and associated legislation. Any soil to be removed should be stockpiled according to material type and kept separately from all other materials prior to removal.

Verification:

- Records should be kept showing the amount and former location of any material removed from site, including Waste Transfer and Consignment Notes. These records need not be provided within the Verification Report but should be available for inspection by the local authority as required.
- Records should be kept showing if any site-won arisings have been used to build up garden areas. This should be confirmed as part of the Verification report produced for Section 3.5.

3.3 Potable Water Supply Pipes Liaison

When choosing water supply pipes, it is noted that some PAH contaminants were elevated, when compared to UKWIR assessment values for PE and PVC pipes. These pipes may therefore be unsuitable if laid within the Made Ground and alternative pipes may need to be chosen instead.

The Principal Contractor should liaise the local public water supplier (United Utilities) to confirm the selection of potable water pipes. A copy of the Westlakes GI and Post Demolition Sampling reports should be provided for their information. Following this consultation, a separate risk assessment may need to be completed by a competent person.

Verification: Copies of relevant correspondence and (if required) the United Utilities risk assessment should be provided to the Environmental Protection Department of the Local Authority for their records.

3.4 Appropriate design of below ground concrete

Below ground concrete should incorporate sulphate resistance which has been designed for the ground conditions encountered on site. Below ground concrete will need to incorporate sulphate resistance, where the concrete is in contact with the existing Made Ground. Results for the natural ground have been within the DS1:AC1 classification. However, an appropriate classification for below ground concrete in contact with the Made Ground would be DS3:AC3, based on the mean of the highest two results.

Verification: Confirmation of the below ground concrete mix design including details of its sulphate resistance should be provided as part of the Verification report.

3.5 Validation of Imported Topsoil

The site does not require a capping layer, however there is no topsoil currently present on the site and gardens are included within the development proposals. See Drawing in Appendix 2.

Imported topsoil will therefore be required within the gardens to act as a suitable growing medium for plants.

Topsoil should be from a source that is expected to be uncontaminated. To comply with this the soils should be from a source which has not had a past industrial or obviously contaminating use. Natural or manufactured topsoil may be used provided it meets the requirement of BS3882:2015 'Specification for topsoil'.

Testing

To confirm that imported soils do not pose significant risks to plant health or human health:

- Imported topsoil should be sourced from an approved supplier. The soil supplier should provide chemical test certificates for the soils which should be passed to the validating engineer to confirm the soil is expected to be uncontaminated before it is brought to site.
- Suitability should also be confirmed once the soils have been brought to site via an independent third party (Westlakes) completing a validation visit. The validating engineer should complete a visual inspection (confirming that the soils appear free of deleterious materials such as glass, plastic or demolition rubble) and also collect soil samples for subsequent chemical validation testing. Further validation visits may be required depending on the volume of topsoil and test results. Soil samples should be tested at the frequency and for the determinands stated in the following table:

Source	Testing Frequency	Testing Schedule
Greenfield/ Manufactured Soils	Minimum of 3 samples or 1 sample per 250m ³ (whichever is greater)	Metals/metalloids (to include arsenic, cadmium, total chromium, hexavalent chromium, copper, mercury, nickel, lead, selenium and zinc) Speciated PAH – USEPA 16 Asbestos
Brownfield/ Screened Soils	Minimum of 6 samples or 1 sample per 100m ³ (whichever is greater)	As above, and: Speciated TPH – CWG Banding Additional analysis dependant on the source history.

The above is based on the YALPAG Guide "Verification Requirements for Cover Systems", version 3.4.

The chemical test results should be compared to the residential with plant uptake GAC in Appendix 3, which are based on GAC provided by LQM as S4ULs and Defra's C4SLs.

The soil is considered acceptable if all the test results are below the GAC. If the material is found to be unacceptable, further testing and risk assessment could be carried out to try to demonstrate its suitability, otherwise it should not be placed within garden areas, and instead it should be removed from site. The results of any further risk assessment must be agreed with the Local Authority.

Depth

A minimum thickness of 150mm of imported topsoil is recommended for gardens.

Topsoil can be placed over the existing soils. The underlying soils should be dug over prior to placement of the topsoil to improve their drainage characteristics, as they may have become compacted during the construction works. This will also allow for inspection of the existing soils, which have already been tested and are considered to be chemically suitable to remain on site. The soils also need to be physically suitable for use in a garden area and therefore they should be inspected by the groundworker. Any obviously unsuitable materials, such as construction rubbish/debris, whole bricks or glass (if present), should be removed prior to placement of the topsoil.

The required quantities of topsoil should be guided by advice from the landscape architect.

If, during regrading work, any evidence of significant contamination is encountered it should be treated as discussed in the Watching Brief.

Stockpiles

Stockpiles of topsoil should be placed in clearly identified demarcated zones. Each stockpile should have a marker clearly showing its testing status. Material marked as untested is not to be used. Only one stockpile should be used as a source at any one time. Another stockpile may not be used until the current stockpile is exhausted.

If it is not possible to stockpile imported material on-site because of lack of space or other operational reason, then the soils may be tested at source for the possible contaminants given in Appendix 3. If the soils meet these criteria, they may be transported to site for use in the garden areas. A record of this transport should be kept for use as part of the verification reporting.

Documentation for Imported Material

The site manager should keep a record of each batch of material and use a clear referencing system.

The following should be recorded:

- the batch reference (e.g. Stockpile A,B,C,D etc)
- date and time of delivery to site
- where it came from (source)
- the volume of material (number of loads/m³)
- when samples were taken for chemical testing (validation report)
- when the chemical test results were obtained (validation report)
- whether the chemical test results showed the material to be satisfactory (validation report)
- when the material started to be used (date)
- where it was used (validation report)



- when the material was exhausted (date)

Each entry shall be signed/ dated by the site manager or their assistant. These sheets should be kept on site and be available for inspection by the Local Authority and the validating engineer as required.

Validation: Independent Validation visit(s) and chemical testing of imported topsoil is required to confirm the suitability of soils placed within the garden areas. Test results should be compared to the GAC provided in Appendix 3 and the depth of soils confirmed. The Principal Contractor should notify Westlakes to coordinate the timing of visit(s) with the construction activities. Verification report(s) to be produced and submitted to the Local Authority.

4 Verification

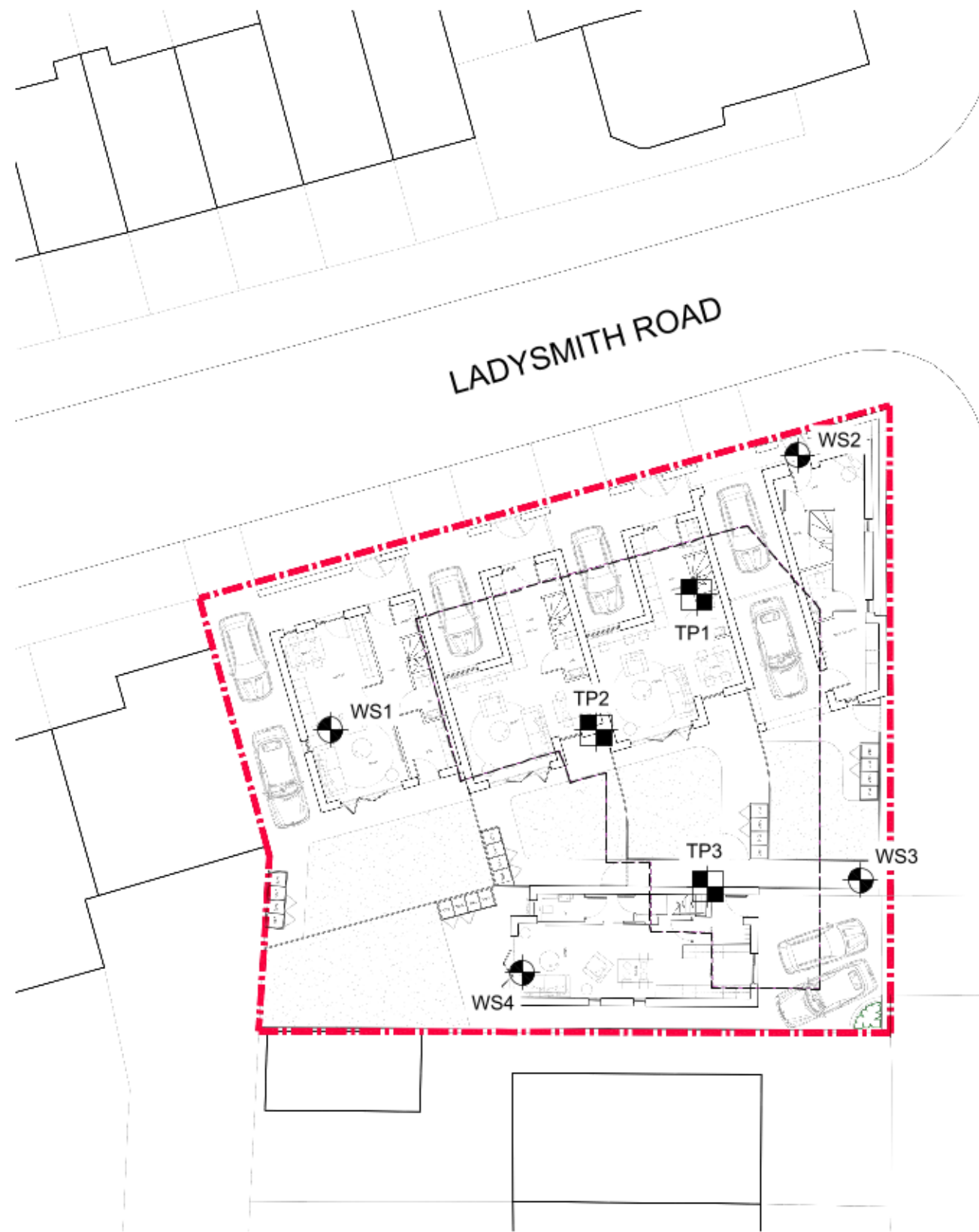
The timetable for completion of each of these remediation objectives is dependent on the sequence of construction works. Objectives should be validated once the work has been undertaken.

Validation records should be passed onto the Environmental Protection Department of the Local Authority to facilitate discharge of related planning conditions. These records are likely to include:

- A description of the works carried out.
- All chemical laboratory test certificates (as appropriate).
- Confirmation that all identified remediation objectives have been met.
- Details and justification of any changes from the agreed remediation strategy. Necessary variations to the agreed Validation Plan, arising during the course of the works, will also be notified to and agreed with the Local Authority within a period of two weeks.
- Confirmation of whether further works are required.



Appendix 1 – Site Location Plan



GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES, RELATIVE TO ORDNANCE DATUM SURVEY
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS TOGETHER WITH THEIR SPECIFICATIONS AND REPORTS.
4. DO NOT SCALE FROM THIS DRAWING, ONLY WRITTEN OR CALCULATED DIMENSIONS TO BE USED.

LEGEND

-  WINDOW SAMPLE BOREHOLE (JUNE 2019)
-  POST DEMOLITION SAMPLING TRIAL PITS (OCTOBER 2020)
-  OUTLINE OF FORMER BUILDING ON SITE

EXPLORATORY HOLE LOCATION PLAN

(SCALE: NTS)

P2	03.11.20	TRIAL PITS ADDED	MF	HB	HB
P1	JULY 19	PRELIMINARY	JS	JT	CP
Rev	Date	Details	By	Chkd	Appd

	
Client	
KAMANI PROPERTY GROUP	
Project	
88 SCHOOL LANE, DIDSBURY	
Title	
EXPLORATORY HOLE LOCATION PLAN	
Drawing No.	Rev
WL_1338_001	P2
Scale	Date
NTS	JULY '19
Drawn	Checked
JS	JT
Approved	
CP	
Unit 2.1, 20 Dale Street, Manchester. M1 1EZ	
Tel. 0161 236 8203	



Appendix 2 - Proposed Future Site Layout



Appendix 3 - Generic Assessment Criteria

Plant Health Assessment Value				
	pH 5-5.5	pH 5.5-6	pH6-7	pH ≥7
Zinc	200	200	200	300
Copper	80	100	135	200
Nickel	50	60	75	110

GAC for plant health are taken from 'The Soil Code' MAFF 1998, BS3882 Specification for Topsoil and Guidance 'Sewerage Sludge on Farmland' DEFRA 2017. Plant sensitivity will depend on the plant species used within landscaped areas. The GAC are pH dependant. A soil pH of >7 typically applies however if the pH is <7, then it is permissible to use the other values as appropriate.

(mg/kg unless stated otherwise)

Human Health GAC		
Metals/Metalloids	Residential with home-grown produce	Source of GAC
Arsenic	37	CIEH/LQM/C4SL
Cadmium	11 (22)	CIEH/LQM (C4SL)
Chromium (total)	910	CIEH/LQM
Cr VI	6 (21)	CIEH/LQM (C4SL)
Copper	2,400	CIEH/LQM
Lead	200	C4SL
Mercury (inorganic)	40	CIEH/LQM
Nickel	130	CIEH/LQM
Selenium	250	CIEH/LQM
Zinc	3,700	CIEH/LQM



Petroleum Hydrocarbons	Residential with home-grown produce		
SOM Content	1%	2.5%	6%
Aliphatic EC 5-6	42	78	160
Aliphatic EC >6-8	100	230	530
Aliphatic EC >8-10	27	65	150
Aliphatic EC >10-12	130	330	760
Aliphatic EC >12-16	1,100	2,400	4,300
Aliphatic EC >16-35	65,000	92,000	110,000
Aliphatic EC >35-44	65,000	92,000	110,000
Aromatic EC 5-7 (benzene)	70	140	300
Aromatic EC >7-8 (toluene)	130	290	660
Aromatic EC >8-10	34	83	190
Aromatic EC >10-12	74	180	380
Aromatic EC >12-16	140	330	660
Aromatic EC >16-21	260	540	930
Aromatic EC >21-35	1,100	1,500	1,700
Aromatic EC >35-44	1,100	1,500	1,700
Aliphatic+Aromatic EC >44-70	1,600	1,800	1,900
LQM/CIEH S4ULs for Human Health Risk Assessment			

Asbestos/General	
Asbestos	None Identified
pH	Range of 6.0 to 9.0 typical
Soil Organic Matter (SOM)	Range of 1% to 6% typical



Polyaromatic Hydrocarbons	Residential with home-grown produce		
	1%	2.5%	6%
Acenaphthene	210	510	1,100
Acenaphthylene	170	420	920
Anthracene	2,400	5,400	11,000
Benz(a)anthracene	7.2	11	13
Benzo(a)pyrene	2.2	2.7	3.0
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(ghi)perylene	320	340	350
Benzo(k)fluoranthene	77	93	100
Chrysene	15	22	27
Dibenz(ah)anthracene	0.24	0.28	0.3
Fluoranthene	280	560	890
Fluorene	170	400	860
Indeno(123-cd)pyrene	27	36	41
Naphthalene	2.3	5.6	13
Phenanthrene	95	220	440
Pyrene	620	1,200	2,000
Coal Tar (Bap as surrogate marker)	0.79	0.98	1.1
LQM/CIEH S4ULs for Human Health Risk Assessment			

benzo(a)pyrene	5 (for SOM of 6%).	C4SL
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Notes

Human Health GAC: LQM/CIEH Suitable 4 Use Levels (S4ULs) & Category 4 Screening Levels (C4SLs).

Asbestos identification, if identified then quantification required, then consider how to manage risk.

pH and Soil Organic Matter (SOM) content should also be confirmed.

Concentrations below GAC are unlikely to pose a risk and therefore further assessment is not needed.

Concentrations above GAC require further risk assessment to determine if any further action is needed.