

LAND CONTAMINATION SURVEYS

GS Development Services Ltd Former Builders Yard Cropwell Road Langer Nottinghamshire NG13 9HD

RE: Land off Middle Lane, Nether Broughton – Topsoil Chemical Analysis

1. Introduction

Castledine Environmental has been commissioned by GS Development (the 'Client') to undertaken an environmental chemical assessment of the shallow topsoil present at Middle Lane, Nether Broughton. Chemical testing was undertaken as the Client intends to excavate the shallow soils (~300mm below ground level (mbgl)) from their site at Middle Lane, for intended use in private gardens and areas of soft landscaping at their receiving site at Former Builders Yard, Cropwell Road, Langer NG13 9HD.

A Site Location Plan is presented in Appendix A.

2. Site Setting

The site comprises an area of open pasture land located north of Middle Lane, Nether Broughton, Leicestershire and covers an area of approximately 0.2ha. During the time of the most recent fieldwork, the site was formed by undeveloped pastureland, set within a surrounding residential area in the rural village of Nether Broughton.

3. Ground Investigation

Castledine Environmental attended site on the 16th February 2024 in order to undertake six hand-dug exploratory hole locations (designated SS01 to SS06 inclusive) and progressed to depths of between 0.60mbgl and 0.80mbgl. The location of hand-dug pits are presented on the site plan provided in Appendix B.

The following ground conditions were encountered onsite:

- Topsoil Topsoil was encountered within all hole locations to depth of between 0.50mbgl and 0.55mbgl and generally encountered as a dark brown mottled orange, slightly sandy, silty clay with rare gravels of mudstone. No anthropogenic materials (i.e. brick or concrete) were observed and the topsoil is considered to be a virgin source.
- Weathered Brandon Sandstone Bed Observed within all locations to depths of between 0.60mbgl and 0.80mbgl and not fully penetrated at any location. This stratum was recorded as a grey mottled brown, sandy, silty clay with gravels of sandstone.

<u>Groundwater</u>

Groundwater was encountered within all exploratory hole location at depths of between 0.50mbgl and 0.55mbgl and generally standing upon the underlying natural clay strata. It should be noted that the ground conditions across the field were generally waterlogged during the time of the investigation.

Contamination Observations

No visual or olfactory sign of contamination were noted during the most recent fieldwork, and the soils encountered were considered to be natural undeveloped soils.

4. Contamination Risk Assessment

<u>Human Health</u>

The Client intents to excavate approximately 300mm of soil from within the donor Middle Lane site, to be moved and placed within private gardens and soft landscaping at the receiving site at Former Builders Yard, Cropwell Road, Langer. On that basis, the below chemical assessment has been completed in order to confirm the suitability of the soils for re-use purposes.

The results of the chemical samples have been directly compared against the relevant GAC for residential with plant uptake. In order to adopt a conservative approach, a Soil Organic Matter (SOM) of 1% has been used to assess the topsoil, inline with the intended use of the soils.

The results of the chemical analysis are presented in Appendix D, whilst the soil screening values are presented within the tables below:

Determinant	Units	Accreditation	S4UL (mg/kg)	Highest Value(s) (mg/kg)	Location of Highest value	Exceedance? Y/N
Arsenic	(mg/kg)	MCERTS	37	8.3	SS03	Ν
Cadmium	(mg/kg)	MCERTS	11	<1.6 (LOD)	All locations	Ν
Chromium (total)	(mg/kg)	UKAS	910	31.5	SS03	Ν
Chromium (VI)	(mg/kg)	U	6	<0.04 (LOD)	All locations	Ν
Copper	(mg/kg)	MCERTS	2400	14.1	SS01	Ν
Lead	(mg/kg)	MCERTS	200	54.0	SS05	Ν
Mercury	(mg/kg)	UKAS	1.2	<0.7 (LOD)	All locations	Ν
Nickel	(mg/kg)	MCERTS	180	15.3	SS05	Ν
Zinc	(mg/kg)	MCERTS	3700	75.2	SS05	Ν
Selenium	(mg/kg)	MCERTS	250	<3 (LOD)	All locations	Ν
Total Phenols	(mg/kg)	MCERTS	280	0.7	SS01 & SS05	Ν
рН	pH units	MCERTS	-	4.7 – 5.8	SS04 – SS06	Ν
Asbestos	-	-	-	NAD	-	-

Metals and Semi-Metals – Residential with Plant Uptake (1% SOM)

Non-Metals - Residential with Plant Uptake (1% SOM)

Determinant	Units	Accreditation	S4UL (mg/kg)	Highest Value(s) (mg/kg)	Location of Highest value	Exceedance? Y/N
Naphthalene	(mg/kg)	MCERTS	2.3	<0.02 (LOD)	All locations	Ν
Acenaphthylene	(mg/kg)	UKAS	170	<0.02 (LOD)	All locations	Ν
Acenaphthene	(mg/kg)	UKAS	210	<0.02 (LOD)	All locations	Ν
Fluorene	(mg/kg)	MCERTS	170	<0.02 (LOD)	All locations	Ν
Phenanthrene	(mg/kg)	MCERTS	95	0.06	SS05	Ν
Anthracene	(mg/kg)	MCERTS	2400	<0.02 (LOD)	All locations	Ν
Fluoranthene	(mg/kg)	MCERTS	280	0.15	SS05	Ν
Pyrene	(mg/kg)	MCERTS	620	0.13	SS05	Ν
Benzo(a)anthracene	(mg/kg)	MCERTS	7.2	0.07	SS05	Ν
Chrysene	(mg/kg)	MCERTS	15	0.08	SS05	Ν
Benzo(b)fluoranthene	(mg/kg)	MCERTS	2.6	0.07	SS05	Ν
Benzo(k)fluoranthene	(mg/kg)	MCERTS	77	0.03	SS05	Ν
Benzo(a)pyrene	(mg/kg)	MCERTS	2.2	0.07	SS05	Ν
Indeno(1, 2, 3,-cd)pyrene	(mg/kg)	MCERTS	27	0.05	SS05	Ν
Dibenzo(a,h)anthracene	(mg/kg)	MCERTS	0.24	<0.02 (LOD)	All locations	Ν
Benzo(g, h, i)perylene	(mg/kg)	MCERTS	320	0.04	SS04 & SS05	Ν
Total PAH (Sum of USEPA 16)	(mg/kg)	UKAS	NC	0.76	SS05	Ν

Analysis of Results

The results of chemical analysis have not identified any concentration of contaminants above the relevant GAC for residential with plant update, which is considered inline with the intended use of the soils.

Additionally, no asbestos has been detected within the sample screened (nor was anthropgenic material visually noted within the deposits) and no SVOCs have been detected above the laboratory's limit of detection (<0.1mg/kg) with no tentatively identified SVOC compounds were recorded.

5. Conclusions

The topsoil present within the Nether Broughton donor site have been shown to be uncontaminated, and is considered to be chemical suitability for use in residential gardens and areas of soft landscaping. Additionally, no unwanted or oversized material (brick, concrete or sharps) was observed within any of the soils encountered during the most recent fieldwork.

We trust that the above is suitable for your requirements, should any further information or clarification be required, please don't hesitate to contact us.

Andrew Lamont (BSc, FGS)

Appendices:

Appendix A – Site Location Plan

Appendix B – Exploratory Hole Location Plan

Appendix C – Exploratory Hole Logs

Appendix D – Chemical Analysis Results

APPENDIX A SITE LOCATION PLAN



LAND CONTAMINATION SURVEYS

Address: Middle Lane, Nether Broughton LE14 3HD Client: GS Development Services Ltd





 Castledine Environmental,
 4 Wymeswold Road, Hoton, Loughborough, Leicestershire LE12 5SN

 Telephone: 01509 880399
 info@castledineenvironmental.co.uk

Site Location Plan

APPENDIX B EXPLORATORY HOLE LOCATION PLAN



APPENDIX C EXPLORATORY HOLE LOGS

Project	. Mide	dle Lane	e, Nether Broughton LE14 3HD				Hand-Dug Pit.				
							501				
Client. SV GS Developments						Date.	2022				
Mothod	_		-			16/02/	ZUZ3	000			
Method	l.					Projec	I Relete	ince.			
Hand-n		IS.				3690A	`				
		Death					Sample	s			
GW	Backfill	Depth	Descriptio	on of Strata	Legend		Tuno	Depth (m)			
		(m)				Ŭ	туре	From	To		
0.50m		0.00 - 0.50 0.50 - 0.65	Grass over d mottled orang sandy, silty C fine to coarse of fine to med angular muds (TOPSOIL) Firm, grey mo sandy CLAY. to coarse. (WEATHERE SANDSTON	ark brown ge, slightly CLAY. Sand is e. Rare gravel dium sub- stone. ottled brown, . Sand is fine ED BRANDON E BED)			SS01 ES01	0.20			
Remarks			Kev					1			
Backfill	ed with		Logged By	Scale	She	eet	Sector Castledine				
arisings.		AL Not to Scale			1 of 1						

Project Middle Lane			Nether Broughton E14 3HD			Hand-Dug Pit.					
FIUJECI	. Milde			ghion LE 14 SH	D	SS02					
Client	SV GS Developments					Date.					
onent.	010		lopinenta			16/02/	/2023				
Method	1.					Projec	t Refere	ence.			
Hand-h	eld too	ls.	_			3690A	4				
		Dopth					Sample	s			
GW	Backfill	(m)	Descriptio	on of Strata	Le	gend	Type	Depth (m)		
		(11)					Type	From	То		
			Grass over d	ark brown			SS02	0.25			
			mottled orang	ge, slightly			ES01				
		0.00	sandy, silty C	LAY. Sand is							
		0.00 -	fine to coarse. Rare gravel of fine to medium sub- angular mudstone. (TOPSOIL)								
		0.50									
			Firm, grey me	ottled brown,							
			sandy CLAY. Sand is fine								
0.55m		0.50	to coarse. Ra	are fine to							
		0.50 -	medium, sub	-angular							
		0.60	sandstone pr	esent.							
			(WEATHERE	ED BRANDON							
888888			SANDSTON	E BED)							
Remarks Key			Key	Key							
Backfill	ed with		Logged By Scale		Sheet 🕺						
arising	S.		AL	Not to Scale	1 of 1 Environm		nvironn	iental			
						LAND CONTAMINATION SUR			SURVEYS		

	_										
Project	t Mid	dle Lane	e. Nether Broughton LE14 3HD			D Hand-Dug Pit.					
	,					SS03					
Client	Client SV GS Developments						Date.				
Olicht.	5.	00 000	ciopinenta			16/02	/2023				
Method	1.					Projec	t Refere	ence.			
Hand-h	eld too	ls				3690A	1				
		Deeth					Sample	s			
GW	Backfill	Depth	Descriptio	on of Strata	Legend		Tuna	Depth (m)			
		(m)				-	туре	From	То		
			Grass over d	ark brown			SS03	0.25			
			mottled orand	ge, slightly			ES01				
		0.00 -	sandy, silty CLAY. Sand is								
		0.50	fine to coarse								
			(TOP SOIL)								
			Firm grev m	ottled brown	P###						
			sandy CLAY. Sand is fine								
0.55m											
		0.50 -									
		0.60	coarse, sub-a	anyulai							
SANDSTONE BED)											
Remarks Key			0		1		astladir	10			
Backfill	ed with		Logged By Scale			Sheet Sheet			nental		
arising	S.		AL	Not to Scale	1 of 1			FURVEYE			
						CAND CONTAMINATION SURVEY					

Droioc	t Mid	dia Lan/	Nothor Brou	abton E14.2L	л	Hand	Hand-Dug Pit.				
Projec			e, Nether Brou		U	SS04					
Client SV GS Developments						Date.					
Client.	31	03 Dev	elopinents			16/02	/2023				
Method	1.					Projec	t Refere	ence.			
Hand-h	eld too	ls				3690A	1				
		Dopth					Sample	s			
GW	Backfill	(m)	Descriptio	on of Strata	Legend		Type	Depth (m)			
		(11)				_	Type	From	То		
			Grass over d	ark brown			SS04	0.25			
		0.00 -	mottled orang	ge, slightly			ES01				
			sandy, silty CLAY. Sand is fine to coarse. (TOPSOIL)								
0.55m		0.00									
			Firm, grey me	ottled brown,							
		0 55 -	sandy CLAY. Sand is fine								
			to coarse. Ra	are fine to							
		0.65	coarse, sub-a	angular							
			sandstone pr	esent.							
	(WEATHERED BRANDO										
SANDSTONE BED)											
Remarks Key						`actladi					
Backfill	ed with		Logged By	ged By Scale		eet	Environmental				
arising	S.		AL Not to Scale			1 of 1			SURVEYS		

	_										
Proiec	t Mid	dle Lane	e. Nether Broughton LE14 3HD			Hand-Dug Pit.					
· · · · · · · · · · · · · · · · · · ·			, 3 ,			SS05					
Client SV GS Developments						Date.					
Oliont.	0.	00 004	ciopinicinto			16/02	/2023				
Method	1 .					Projec	t Refere	ence.			
Hand-h	ield too	ls				3690A	۱				
		Death					Sample	s			
GW	Backfill	Depth	Descriptio	on of Strata	Le	aend	-	Depth (m)		
		(m)				J	Туре	From	Τ́ο		
			Grass over d	ark brown			SS05	0.25			
			mottled oran	ne slightly			ES01				
		0.00 - 0.50	sandy, silty CLAY. Sand is tine to coarse				2001				
0.50											
0.50m			(TOPSOIL)	<i>.</i>							
				attlad brown							
			Firm, grey m	ottied brown,							
			sandy CLAY. Sand is fine								
		0.50 -	to coarse. Ra	are fine to							
		0.65	coarse, sub-a	angular							
		0.00	sandstone pr	esent.							
	(WEATHERED BRANDON			ED BRANDON							
SANDSTONE BED)											
Remarks Key			Key								
Backfill	led with		Logged By Scale		Sheet Sheet		astledir	1e Nortal			
arising	S.		AL Not to Scale		1 of 1 Environ		Invironn	iental			
						LAND CONTAMINATION SURVE					

Projec	t Mid	dle Lane	e Nether Broughton E14 3HD			Hand-Dug Pit.					
initiale Earle, Realer Breaghton EE						SS06					
Client SV GS Developments						Date.					
Oliciit.	5.	00 000	ciopinenta			16/02	/2023				
Method	1 .					Projec	t Refere	ence.			
Hand-h	ield too	ls				3690A	1				
		Death					Sample	s			
GW	Backfill	Depth	Descriptio	on of Strata	Le	gend	Tuna	Depth (m)			
		(m)				-	туре	From	To		
			Grass over d	ark brown			SS06	0.25			
		0.00 - 0.50	mottled orang	ge, slightly			ES01				
			sandy, silty CLAY. Sand is fine to coarse. (TOPSOIL) Firm, grey mottled brown, sandy CLAY. Sand is fine to coarse. Rare fine to								
0.55m											
_ _		0.50									
		0.50 -	coarse, sub-a	angular							
		0.60	sandstone pr	resent							
			(WEATHERE	ED BRANDON							
			SANDSTON	E BED)							
Remarks k			Kev	Kev							
Backfill	ed with		Longed By Scale			et		astledir	ne .		
arising	5		Al	Not to Scale	1 of 1		Environmental				
ansings.		AL NOLIO SCALE		1011		LAND CONTAMINATION SURVEYS					

APPENDIX D CHEMICAL ANALYSIS RESULTS

- Found as separate PDF(s)