GROUND ENGINEERING LIMITED
Newark Road Peterborough PE1 5UA
t: 01733 566566 f: 01733 315280
e: admin@groundengineering.co.uk
Company Registration Number 6929574

Lazari Investments Limited
Greater London House
Hampstead Road
London
NW1 7QX

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C12464 Addendum Letter

FAO Mr Tom Williams

Dear Sirs,

Greater London House, Mornington Crescent, London NW1

Lazari Investments Limited, the client, have recently obtained planning consent from Camden District Council for an infill office extension at Greater London House, Mornington Crescent, London NW1.

A two-storey restaurant development, which adjoins Greater London House, has recently been completed on the site of a small petrol-filling station, situated at the northern end of Greater London House, at the junction of Mornington Crescent and Hampstead Road.

A ground investigation was conducted on the site, on behalf of the client in 2011, and the results of that ground investigation were presented in Ground Engineering Limited report C12464; September 2011. The London Borough of Camden have requested an addendum letter report which takes account changes in Legislation and Industry Guidance relating to the assessment of soil contamination.

This letter report provides an updated soil contamination assessment and reference should be given directly to the C12464; September 2011 report.

In summary, the ground conditions beneath the site comprised made ground between 1.20m and at least 4.10m thick. Thicknesses of made ground of about 2.00m and 4.10m were associated with buried concrete slabs considered to either be a layer upon which former fuel tanks were placed or perhaps in the case of the 4.10m deep slab, a former northward continuation of the Greater London House basement adjacent the southern side of the site. The expected London Clay Formation was met at depths between 1.20m and 3.40m outside the centre of the site and was found to at least 20.00m below ground level.

The made ground was composed of mixtures of coarse-grained fill and clay fill. The coarse grained fill comprised brown silty, sandy, and locally clayey, gravel and cobbles of concrete, brick, flint and occasional pieces of mortar, ash, tile, slate, coal, clinker, wood, metal, glass and plastic.

The clay fill comprised firm or stiff dark brown and orange brown mottled slightly sandy, slightly gravelly clay with a gravel fraction of brick, ash, coal, flint, mortar, tile, glass, clinker, concrete and shell fragments.

The made ground was subsequently tested for a broad suite of potential contaminants, outlined by the Environment Agency (EA) and National House Building Council (NHBC) document R&D 66; 2008 'Guidance for the Safe Development of Housing on Land Affected by Contamination'.

Updated Comments on the Results of Chemical Testing

The results of the laboratory chemical testing on near surface soil samples have primarily been compared to soil screening values (SSVs) produced by Land Quality Management Limited (LQM) and the Chartered Institute for Environmental Health (CIEH) presented in their document 'The LQM/CIEH S4ULs for Human Health Risk Assessment: November 2014 (Publication Number S4UL3608)'. The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and are transparently-derived and cautious 'trigger values' above which further assessment of the risks or remedial action may be needed. The S4ULs (Suitable for Use Levels) have been derived, in accordance with UK legislation and Environment Agency policy, using a modified version of the Environment Agency CLEA 1.06 software.

Reference has also been given to ATRISKsoil soil screening values produced by Atkins Limited and provided under licence to Ground Engineering Limited. Atkins SSVs have been derived in line with the Environment Agency 2009 guidance using the CLEA 1.04 and 1.06 software. With the absence of a S4UL for cyanide the ATRISKsoil SSV has been used as the soil screening criteria within this report.

In March 2014 the Department for Environment Food and Rural Affairs (DEFRA) published, in their document SP1010, Category 4 Screening Levels (C4SL) for several contaminants including lead. The C4SL represent screening levels below which the land could be considered suitable for a specified use and definitely not contaminated land in respect of those determinands. With the absence of S4UL for lead the C4SL has been used as the soil screening criteria within this report.

For each contaminant the adopted soil screening criteria have been calculated for the following land uses:

- Residential use with home grown produce
- Residential use without home grown produce
- Commercial and industrial usage

The intended purpose of the SSVs are as "intervention values" in the regulatory framework for assessment of human health risks in relation to land use. These values are not binding standards, but are intended to inform judgements about the need for action to ensure that a new use of land does not pose any unacceptable risks to the health of the intended users.

Table 1 compares the test results for the made ground with the SSVs in relation to the specified uses. The number of test results, which exceed these values, are also provided.

Table 1: Comparison of Chemical Test Results with Soil Screening Values SSV

Determinand	Number of Samples	Min Value (mg/kg)	Max Value (mg/kg)	Number of Samples Exceeding SSV for:			Measured 95th Percentile (mg/kg)	Soil Screening Values SSV (1% SOM)			
				Residential with home grown produce	Residential without home grown produce	Commercial / Industrial		Assessment Method	Residential with home grown produce (mg/kg)	Residential without home grown produce (mg/kg)	Commercial/ Industrial (mg/kg)
Organic matter	6	0.88%	6.0%	-	-	-	-	-	-	-	-
Arsenic	6	11	27	0	0	0	22.82	S4UL	37	40	640
Cadmium	6	0.11	0.44	0	0	0	0.39	S4UL	11	85	190
Trivalent* Chromium	6	17	35	0	0	0	29.82	S4UL	910	910	8,600
Hexavalent Chromium	6	<0.5	<0.5	0	0	0	<0.5	S4UL	6	6	33
Lead	6	60	1000	4	1	0	493.37	C4SL	200	310	2330
Mercury	6	<0.10	3.4	0	0	0	2.19	S4UL	11	15	320
Selenium	6	<0.20	0.85	0	0	0	0.59	S4UL	250	430	12,000
Nickel	6	14	33	0	0	0	27.45	S4UL	130	180	980
Phenols	6	<0.3	<0.3	0	0	0	<0.3	S4UL	120	440	440
Benzo[a]pyrene	6	<0.1	2.7	1	1	0	1.51	S4UL	0.79	1.2	15
Copper	6	15	100	0	0	0	72.00	S4UL	2400	7100	68,000
Zinc	6	82	350	0	0	0	278.51	S4UL	3,700	40,000	730,000
Free Cyanide	6	<0.50	<0.50	0	0	0	<0.50	ATRISK	34	34	34

Notes

*The concentration of Trivalent Chromium is assumed to be equivalent to the Total Chromium concentration. This is because most naturally occurring chromium is in the trivalent (chromic) state.

S4UL and C4SL for metals were derived using 6% SOM. These values are not sensitive to SOM and would also be applicable for 1% SOM and 2.5% SOM

Discussion of Results

The results of the laboratory analysis indicate the made ground locally contained elevated concentrations of lead and benzo[a]pyrene, which exceeded residential soil screening values. None of the recorded concentrations exceeded the screening values for a commercial end use.

Statistical analysis, based on the mean value test, indicates that the US95 values for lead and benzo[a]pyrene exceeded the corresponding screening values for residential end uses, but none exceeded those for a commercial end use.

In summary, no significant evidence of residual TPH pollution was found by the investigation, and no free product was encountered. Total petroleum hydrocarbon results ranged between <10mg/kg and 690mg/kg in the soil.

The results of this analysis indicate that the made ground beneath the site would not be suitable for retention at the surface in a residential setting, due to the presence of statistically elevated concentrations of lead and benzo[a]pyrene within the made ground.

The soils tested would be suitable within a commercial setting, which is considered comparable to the proposed end use at ground level.

Conclusions

The reassessment of the chemical test results indicate that the conclusions presented in Ground Engineering Limited report C12464; September 2011 are still applicable in accordance with current Legislation and Industry Guidance.

GROUND ENGINEERING LIMITED

J. H. GIBB

B.Sc. (Hons.), M.Sc. (Eng.), C.Geol., F.G.S.

Senior Geo-Environmental Engineer

S. J. FLEMING

M.Sc., M.C.S.M., C.Geol., F.G.S.

Director