

THE LAND CONSULTANCY LIMITED



SPECIALISTS IN:



**Landfill Gas
Surveys**



**Geo-Environmental Site Investigations
(Including Desk Studies and Risk Assessment)**



**Shallow Mining Surveys
and Treatment**



Contaminated Land Investigation and Remediation



Geotechnical Wind Farm Site Investigation

The Land Consultancy Limited – About Us



The Land Consultancy Limited (TLC) was founded by Dr Stephen Knott in September 2003 principally to provide professional consultancy services to the construction industry with respect to soils and groundwater contamination, ground gases, foundation solutions, shallow mining and waste management.

With small offices situated just outside Preston our rates are likely to be more affordable than our city centre based competitors. Although all sites are considered, as TLC's offices are situated close to the M6, M61, M62, M65 and M66, we are ideally situated to investigate properties throughout the North-West, Cumbria, the Midlands and West Yorkshire.

All works (including all site supervision) is undertaken by personnel with more than 10years relevant experience. A large proportion of this work is either repeat business from satisfied clients or follows on from recommendations made by these clients to other professionals. This bares testimony to the high standard of work produced by TLC on each and every commission.



All sites investigated ... in all weathers!



The Land Consultancy Limited - Services



TLC has already successfully completed 640 jobs which have involved geotechnical, contamination, ground gas and mining appraisals of a wide variety of sites. TLC's clients include developers, renewable energy companies, structural engineers, site investigation companies, architects, Local Authorities, funders, insurance companies, solicitors, consultants and corporate bodies.

The Land Consultancy Limited can offer consultancy services in the following areas:

Contaminated Land Investigations (including Due Diligence Audits)

Phase 1 Investigations – Desk studies, site walkover surveys and statutory services searches undertaken. Preliminary conceptual site model presented and advice as to whether and to what extent Phase 2 site investigation works are required to be carried out is given.

Phase 2 Investigations – Site investigations are designed and tailored to the findings and recommendations made within the desk study. Soil and groundwater samples are analysed and interpreted against latest published screening values derived for the protection of human health, ecological receptors, controlled waters, buried concrete and services. The preliminary conceptual site model presented within the desk study is refined in the factual and interpretive site investigation report and remedial advice is given if possible.

If necessary detailed human health or controlled waters quantitative risk assessments may be advised to be conducted to enable appropriate remedial advice to be given.

Remedial method statements, remedial supervision and validation reporting (e.g. of contamination hotspot removal) are also undertaken.

If the works are required to discharge contaminated land planning conditions the Local Authority is involved at an early stage. The Environment Agency would also be engaged should the site pose a significant risk to controlled waters.

Ground Gas Surveys

Ground gas and groundwater level surveying is normally undertaken immediately following completion of the Phase 2 site investigation works. Gas monitoring is conducted using a Geotech GA2000 gas analyser for carbon dioxide, methane, oxygen and hydrogen sulphide gas, flow rate and pressure differentials. Gas risk assessments are completed and advice is given as to the level of gas protection measures required to be installed into proposed developments to protect end users.

Geotechnical Investigations

Laboratory and in-situ testing undertaken to determine geotechnical properties of the soil and rock. Foundation and floorslab advice given. Slope stability and retaining wall investigations can be undertaken.

The Land Consultancy Limited – Services cont^d



Mining Investigations

Mining desk studies and intrusive investigations undertaken to determine whether shallow workings/mine entries are present. If found, advice is given related to the stabilisation of these features so that the risk to future developments on the site from mining related subsidence is minimised/eliminated.

Waste Disposal

Site operations (e.g. foundation excavation and remediation) can result in soils which need to be disposed of off site either to landfill or to some other licensed facility.

The Land Consultancy Limited is able to provide advice as to the most cost effective and appropriate way to dispose of unwanted soils materials.

Wind Farm Site Investigation

The Land Consultancy Limited has successfully completed many wind farm site investigations for one of the UK's largest energy suppliers, RWE Npower Renewables Ltd.

Investigations recently undertaken include:

- Cottam Farm Wind Farm, East Riding of Yorkshire – Spring 2013 <desk study only>
- Burn of Whilk Wind Farm, Nr. Wick (9 turbines) – Winter 2012/2013
- Hameldon Hill Wind Farm Extension, Nr. Burnley (3 turbines) – Autumn 2011 and Summer 2012
- Hampole Wind Farm, Nr. Adwick-le-Street, South Yorkshire (4 turbine site) – Spring 2011
- Earls Hall Wind Farm, Nr. Clacton-on-Sea, Essex (5 turbine site) – Summer 2010
- Middleton Wind Farm, Nr. Newton Mearns, Renfrewshire (8 turbine site) – Winter/Spring 2010
- Novar Wind Farm Extension, Nr. Evanton, N. Scotland (16 turbine extension) – Winter 2009/2010
- Hellrigg Wind Farm, Nr Silloth, Cumbria (4 turbine site) – Summer 2009
- Middlemoor Wind Farm (18 turbine site), just off the A1 8km North of Alnwick, Northumberland – Winter 2008/2009
- Lochelbank Wind Farm, Nr Perth (12 turbine site) – Summer 2008
- Lindhurst Wind Farm, Nr Mansfield (5 turbine site) – Summer 2008
- Goole Fields Wind Farm (16 turbine site) – Spring/Summer 2008
- Bilbster Wind Farm, Nr Wick (3 turbine site) – Spring 2006
- Knab's Ridge Wind Farm, Nr. Harrogate (8 turbine site) – Winter 2005/Spring 2006
- New Barn, Hameldon Hill, Nr Burnley (3 turbine site) – Autumn 2005

TLC has recently (Autumn 2013) provided geotechnical site investigation and consultancy works for ADAS UK Limited, for 4no. individual turbine sites located within the East Riding of Yorkshire.

A ground gas survey was undertaken on West Coast Energy Ltd's Flimby Wind Farm site in Cumbria during Winter 2009/2010. A factual and interpretive report on the results of these works was subsequently issued.

Issues other than standard geotechnical appraisal which have required investigation include shallow mining, fault location and unexploded WWII ordnance. Works have been undertaken on sites containing ecologically sensitive areas. Forestry Commission liaison and tree felling have been required to be undertaken on several sites prior to site investigation works being undertaken.

The Land Consultancy Limited – Projects



Following completion of the site investigation works and laboratory testing, a factual and interpretive report is supplied providing advice with respect to turbine foundation, concrete and track way design. The report also provides advice with respect to utilising excavated crushed stone from on site borrow pits.

Listed below are examples of recently completed projects.

Site Investigation for the Novar Wind Farm Extension, Nr. Evanton, N. Scotland

The wind farm extension is to comprise of 16no. turbines, a meteorological mast, new and upgraded forest tracks and a substation. A large borrow pit and a temporary works compound will be in use during the construction period.

The investigation was undertaken between Nov. 2009 and Feb. 2010 on land between 1,500' to 2,000' asl during one of the worst Scottish Winters for 50 years. Tree felling was undertaken over parts of the site so that access could be gained into all of the areas to be investigated; geophysics was also completed over areas of deep peat to determine whether underground caverns/streams were present. Intrusive site investigation works included rotary coring (turbine, met. mast and borrow pit positions), in-situ testing (SPTs and plate load tests) and trial pitting.

The site investigation works were successfully completed despite the difficult terrain (steeply sloping, deep hags within the peat, deep snow, tree stumps/brash/logs, and soft ground). To aid mobility across the soft ground (deep snow/peat): low bearing pressure tracked plant was used (dumper, muskegs, rigs and excavator); one of the rigs was mounted on a sled; wheeled vehicles utilised snow chains; and, snow shoes were worn by site operatives.



The Land Consultancy Limited – Projects cont^d



Of concern during the site investigation works was the pollution of the nearby pristine Loch Glass by hydrocarbons (from spillages during refuelling, hydraulic hose pipe bursts etc.) and sediment finding their way into one of the burns flowing rapidly down off the hill. Prior to any works being undertaken, silt traps were constructed and oil booms installed at various elevations along each burn which could have potentially been affected. All pollution prevention works were completed to the satisfaction of Scottish Water. No significant pollution incidents occurred during the site investigation.

Site Investigation for Bilbster Wind Farm, Nr. Wick

Proposed for this wind farm were new access track, three turbines, a meteorological mast, a borrow pit and a substation/control building. The site investigation was undertaken in April 2006 (occasionally in extreme weather!) and involved trial pitting, open hole rotary drilling (with SPT's), rotary coring and in-situ CBR/plate load testing. Two of the turbines and several of the access tracks were located within a semi-mature conifer plantation sited over a deep peat bog.



The Land Consultancy Limited – Projects cont^d



The pictures above show one of the turbine positions being cored over the peat bog. The other two show the wind farm nearing completion – with blades being installed on one of the turbines.

Hydrocarbon Remediation – Proposed Residential Development in North Wales

A former garage with an underground leaking waste oil tank had resulted in the contamination of a large volume of soils and groundwater. Following a delineation exercise and completion of quantitative risk assessments for both human health and controlled waters, soils and groundwater remediation were undertaken to clean-up levels agreed with the Local Authority and Environment Agency, principally to reduce the risks to a nearby brook. The site has since been redeveloped for residential housing.



Waste oil contamination before remediation



Same area after remediation

The Land Consultancy Limited – Projects cont^d



Contract: Large Construction Chemicals and Products Manufacturing Works in Manchester

Client: Confidential

Brief Description of Project

Previous and Current Land Usage: Cotton Mill (1880-1940's), a soap and cleaning products factory (1950's to 1970's) and construction chemicals and products manufacturing from 1970's to present day.

Proposed Development: Depending upon the results of the environmental site investigation works and potential estimated remediation costs the client would decide to either: sell the site for residential redevelopment purposes; or, remain and continue to improve the property for its current construction chemical/products manufacturing usage.

A detailed Phase I desk study and site walkover survey was initially undertaken which identified numerous potential sources of contamination on this complex industrial 2.5Ha site. Several mine shafts were also identified. Phase II site investigation works and associated chemical testing encountered large amounts of contamination over some areas of the site. When compared to published screening values, this contamination was considered to pose a risk to human health (current workers, post re-development workers/residential property occupants and to off-site residents); and, to a nearby watercourse. Gas and groundwater monitoring works were undertaken. Based on the results of the investigation and estimated remedial costs, the client decided to continue and improve the existing chemicals manufacturing facilities.

Subsequent groundwater modelling and more detailed risk assessment work indicated that offsite residents and the nearby watercourse were unlikely to be at risk from site borne contamination. Consequently, remediation works were not considered necessary.

The Land Consultancy Limited provided environmental consultancy advice between Autumn 2007 and Autumn 2008.

Contract: Former Petrol Station at Lostock Hall, Nr. Preston

Brief Description of Project

Previous Land Usage: Petrol Station

Proposed Development: Residential Apartment Block

Desk Study and preliminary site work indicated that some areas of this former petrol station site were heavily contaminated with petrol and diesel. A soil vapour survey was subsequently undertaken to determine the extent of volatile contamination present.

Human health Quantitative Risk Assessments (QRA) undertaken using RBCA indicated significant risks to human health from volatile contamination. Default input values within the RBCA model were adjusted to be compliant with the values set out by the CLEA methodology. QRA undertaken using ConSim also identified significant risks to an adjacent culverted watercourse. Remedial works were required to reduce risks to human health and the watercourse; remedial target values were first agreed with South Ribble Borough Council and the Environment Agency.

The Land Consultancy Limited – Projects cont^d



Petrol station remediation continued...

Approximately 400 tonnes of contaminated soil was excavated and disposed of to landfill and three unknown badly corroded old cast iron petrol tanks were encountered adjacent to Watkin Lane. Petrol and diesel contaminated perched groundwater was pumped for temporary storage into 1m³ IBCs before being tankered off site and disposed of at a suitably licensed facility. The remedial excavation was subsequently backfilled with locally sourced reworked Boulder Clays following confirmatory testing.

Regulator sign off obtained following submission of the validation report. Remediation works were undertaken during Summer 2007.



- ***Desk Studies***
- ***Geo-environmental Site Investigations and Risk Assessments***
- ***Ground Gas Surveys***
- ***Contaminated Land Remediation***
- ***Local Authority and Environment Agency Liaison***
- ***Geotechnical Site Investigations***
- ***Shallow Mining Surveys and Treatment***
- ***Waste Soils Disposal Advice***
- ***Wind Farm Site Investigation***

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