TERRAGEN
Environmental Consultants

The Riding
4 Village
Sherrington
[redacted]

Phase 1 Site Survey

for

Fort Road Garage
Fort Road East
Littlehampton
West Sussex
BN17 7QZ

on behalf of

G.T. Design and Build

Our ref.: TJ2495AR1
June 2011

www.neeviaPDF.com

Terragen Environmental Consultants Limited
Registered in England & Wales (Registered No. 3711942)
Registered Office: 11a St John Street, Newport Pagnell, Bucks MK16 8HJ
VAT Reg. No. 883 5939 08

ARUN DISTRICT COUNCIL LU/363/14/PL

CONTENTS

1.0 INTRODUCTION 4
2.0 REMIT AND APPROACH 4
2.1 Remit 4
2.2 Contaminated Land Investigation Approach 5
3.0 PHASE 1 SITE SURVEY 6
3.1 Site Location, History and Proposed Development Plans 6
3.1.1 Site Location 6
3.1.2 Site History 6
3.1.3 Site Walkover 8
3.2 Geology and Ground Conditions 9
3.2.1 Published Geology 9
3.2.2 BGS Borehole Records 9
3.2.3 Other Ground Conditions 10
3.3 Controlled Waters 10
3.3.1 Hydrogeology and Groundwater 10
3.3.2 Hydrology and Surface Water Features 12
3.3.3 Flood Risk 12
3.4 Environmental Setting 13
3.4.1 Authorisations, Incidents and Registers 13
3.4.2 Landfill and Other Waste Sites 14
3.4.3 Current Land Uses 15
3.4.4 Environmentally Sensitive Land Uses 15
4.0 TIER 1 QRA 16
4.1 Potential Sources 16
4.1.1 Potential Sources of Contamination 16
4.1.2 Areas of Potential Concern (APC) 16
4.1.3 Potential Contaminants of Concern (PCoC) 16
4.2 Potential Receptors 16
4.3 Potential Pathways and SPL 17
4.3.1 Human Health SPL (Commercial Residents) 17
4.3.2 Flora and Fauna SPL 17
4.3.3 Groundwater SPL 18
4.3.4 Surface Water SPL 18
4.3.5 Buildings and Construction Materials SPL 18
4.4 Preliminary CSM & Risk Assessment 19
5.0 CONCLUSIONS AND RECOMMENDATIONS 20
5.1 Additional Works 20
5.2 Regulatory Approval 20
6.0 LIMITATIONS AND USE OF THIS REPORT 21

FIGURES

Figure 1 Site Location and Proposed Development Plan.

APPENDICES

Appendix A Contaminated Land Investigation Protocol.
Appendix B GroundSure Report.
Appendix C Arun District Council Search Records.
Appendix D BGS Borehole Logs.
Appendix E Photographic Record.

www.neoviaPDF.com

© Tetragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

1.0 INTRODUCTION

Terragen Environmental Consultants Limited (TGEN) was commissioned by G.T. Design and Build (the client), via a written instruction to proceed (email) dated 11/05/2011, to undertake a Phase 1 site survey at Fort Road Garage, Fort Road East, Littlehampton, West Sussex, BN17 7QZ (the site) in order to address contaminated land conditions likely to be attached to any planning permission granted by Arun District Council (the local authority) and/or the requirements of the Environment Agency (the agency) for development at the site. A site location plan is presented on Figure 1.

2.0 REMIT AND APPROACH

We understand that it is proposed to submit a planning application to the local authority for the demolition of the existing buildings/structures at the site, prior to the erection of four (4) residential dwellings with parking and private gardens.

On the basis that the proposed use is more sensitive than the existing use of the site we would anticipate that should permission be granted for the proposed development a number of conditions relating to the investigation and subsequent management of potentially contaminated land will be included. We would assume that those related to potential contamination would be similar to the following:-

No development approved by this permission shall be commenced prior to a contaminated land assessment and associated remedial strategy, together with a timetable of works, being submitted to the local authority for approval.

(a) The contaminated land assessment shall include a desk study to be submitted to the local authority for approval. The desk study shall detail the history of the site uses and propose a site investigation strategy based on the relevant information discovered by the desk study. The strategy shall be approved by the local authority prior to the investigations commencing on site.

(b) The site investigation, including relevant soil, soil gas, surface and groundwater sampling, shall be carried out by a suitable, qualified and accredited consultant/contractor in accordance with a quality assured sampling and analysis methodology.

(c) Approved remediation works shall be carried out in full on site under a quality assurance scheme to demonstrate compliance with the proposed methodology and best practice guidance.

(e) If, during the works, contamination is encountered which has not been previously identified, then the additional contamination shall be fully assessed and an appropriate remediation scheme agreed with the local authority.

(f) Upon completion of the works, this condition shall not be discharged until a closure report has been submitted to and approved by the local authority. The closure report shall include details of the proposed remediation works and quality assurance certificates to show that the works have been carried out in full accordance with the approved methodology. Details of any post-remedial sampling and analysis to show the site has reached the required clean-up criteria shall be included in the closure report together with the necessary documentation detailing what waste materials have been removed from site.

2.1 Remit

Our remit for the investigation included for a Tier 1 quantitative risk assessment (QRA) in order to:-

- Assess the presence and significance of potential sources at and in the vicinity of the site.
- Assess the presence and significance of potential sensitive receptors at and in the vicinity of the site.
- Assess the presence and significance of plausible pathways at and in the vicinity of the site.
- Assess the potential environmental liabilities and consequences associated with the development of the site.
- Construct a preliminary conceptual site model (CSM) for the development.

© Terragen Environmental Consultants 2011

www.nqevidencePDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

- Identify requirements for further works, including the design of a Phase 2 site investigation (if deemed necessary).

2.2 Contaminated Land Investigation Approach

Environmental assessors use a Source-Pathway-Receptor (SPR) conceptual site model when determining the risk posed by a potentially contaminated site. For potential risk to arise each stage of the SPR linkage must be present, plausible and significant. Our approach to the Phase 1 site survey is detailed in Appendix A.

www.neeviaPDF.com

© Tetragen Environmental Consultancy 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

3.0 PHASE 1 SITE SURVEY

The following section comprises a review of the information obtained by TGEN as part of the Tier 1 ORA including:-

- Interviews with key stakeholders.
- Geological maps of the local area.
- GroundSure Report relating to the site and surrounds (presented in Appendix B).
- Records provided by the local authority (presented in Appendix C).
- British Geological Survey (BGS) logs from the vicinity of the site (presented in Appendix D).
- Site visit(s), site survey(s) and photographic record(s) (presented in Appendix E).
- Archaeology Data Service, Natural England and MAGIC search records.

3.1 Site Location, History and Proposed Development Plans

3.1.1 Site Location

The site comprises an irregular shaped plot of land (area 0.08ha) immediately to the N of Fort Road East circa 1km to the NW of Littlehampton and centred approximately at National Grid Reference (NGR) TQ 0225 0266.

3.1.2 Site History

A review of the 1:1,250, 1:2,500, 1:10,000 and 1:10,560 historical maps of the area indicate the following potentially contaminative land uses within 250m of the site:-

Type	Use	Date(s) of mapping	Distance (m)	Direction
Potentially Contaminative Uses	Depot and Destructor Works	1932 to 1938	On Site	On Site
	Works	1957 to 1992	0 to 100	S, W, SW
	Commercial/Industrial	1932 to 1938	140 to 145	SW
	Ambulance Station	1992	142	SE
	Gas Works	1896 to 1974	140 to 200	SW
	Works (unspecified)	1974 to 1992	230	S
	Railway Sidings	1910	247	SW
Historical Tanks	Tanks (Unspecified)	1932 to 1938	187	SW
	Tanks (Unspecified)	1932 to 1992	198	SW
	Tanks (Unspecified)	1932 to 1938	200	S
Historical Energy Features	Electricity Sub-Station	1957 to 1993	23	S, SE
	Electricity Sub-Station	1957 to 1993	82	W
Historical Petrol and Fuel Stations	None	n/a	n/a	n/a
Historical Garage / Motor Vehicle Repair Sites	None	n/a	n/a	n/a
Potentially In-filled Land	Depot and Destructor Works	1938	On Site	On Site

Records from the local authority show that the site was not developed until sometime after 1911, with a depot and destructor works with a chimney located within 5m of the SW boundary of the site. The site was formerly known as a old mower workshop.

Planning records of the site and vicinity from 1947 show a number of industrial/commercial uses (depots and works). Whilst not referencing the site, it is considered likely that application LU/545/89/B dated 02/01/1990 for the construction of a new vehicle workshop and various alterations to existing

© Tetragen Environmental Consultants 2011

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

buildings at the Harwood Road depot may relate to the site. Subsequently, application LU/246/92 for the siting of a portakabin adjacent to the former mower workshop for office use (Class B1) was granted in 1992. In 2006, application LU/325/05 for a change of use from a LPG storage yard to car valeting, vehicle leasing and sale of ex-lease vehicles was refused.

The local petroleum officer (trading standards at West Sussex County Council) and the local authority confirmed that no records pertaining to the presence of storage tanks at the site exist. This would suggest that there are and have been no underground storage tanks (UST) located at the site, although it is possible that above ground storage tanks (AST) have been present. The local authority confirmed that diesel UST are located at the Verdant depot immediately to the SE of the site.

www.neeviaPDF.com

© Terragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

3.1.3 Site Walkover

A walkover survey including interviews with the client/landowner was undertaken in accordance with DoE (1994a), Environment Agency (2004a) and BSI (2001) by a geo-environmental engineer from TGEN on the 18/05/2011. Observations made during the walkover are summarised below and should be read in conjunction with the plans presented in Figure 1, and the photographic record presented in Appendix F.

Site Address	Fort Road Garage, Fort Road East, Littlehampton, West Sussex, BN17 7QZ.	
Site Area	0.08ha.	
Grid Reference	TQ 0325 0766.	
Usage	Car mechanics/repair workshop.	
Feature	**Details**	**Description**
Land-Use Surrounding the Site	North	Residential houses and gardens.
	South	Fort Road East with industrial/commercial beyond.
	East	Industrial/commercial (Verdant depot).
	West	Residential, hospital and commercial units.
Access	n/a	Direct from Fort Road East to the south of the site.
Topography	Site	Sloping from N to S.
Buildings	Site	The mechanics was housed in a small, single-storey, concrete structure with a pitched roof which was located in the N half of the site. A small, brick built office with a flat roof was located on the NE corner of the building. To the S of the building was a concrete slab covering an external inspection pit. A tower ground floor/basement [illegible] located to the SW of the building, which was used to store tyres. A portacabin was located in the SE corner of the site.
Surfacing	Site	The majority of the site was hard-standing comprising the footprint of the mechanics building, access routes and parking areas. In general, the hard-standing appeared to be in a good state of repair. A small area to the W of the existing buildings was soft surfaced.
Vegetation	Site	Vegetation was primarily to the W of the existing buildings and comprised grass, weeds and general scrub/wildflowers. Shrubs and mature trees in the residential garden to the N of the site appeared to be in a good state of health with no obvious signs of illness or disease.
Foundations	Site	Not investigated, although we would assume that strip foundations have been used.
Services	Site	Not observed, although assumed to enter the site along the S boundary via Fort Road East at the entrance to the site.
Activities	Site	The site was operational at the time of the walkover, as a car repair/mechanics. Much of the external areas of hard-standing in the N and NE of the site were used for parking vehicles.
Tanks	Site	No tanks were observed at the site. There was no evidence of underground storage tanks (UST) at the site. A concrete slab to the S of the vehicle inspection pit suggested that above ground storage tanks (AST) may have been located at the site in the past.
Interceptors	Site	None observed.
Surface Water	Site	None on site or observed in the immediate vicinity.
Additional Observations:	Site/ Surrounds	The pitched roof of the building comprised corrugated, cement sheets, which may potentially contain asbestos. A fuel dispensing point (island) was noted within the yard area of the Verdant depot to the E of the site. Various items and materials were observed around the site such as tyres, used drums, chairs, furniture, engine parts and litter.

www.neWIGDIT.com

© Tetragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

3.2 Geology and Ground Conditions

3.2.1 Published Geology

The published geological survey map (1:50,000 scale, British Geological Survey, Sheet 317/332, Chichester and Bognor, Solid and Drift Edition) for the Littlehampton area is summarised in sequence from the surface in the table below:-

Strata	Aquifer Designation	Area Covered	Estimated Thickness	Age	Typical Description
Near Surface Soil/Made Ground	No	Whole Site	0 to 1m	Recent	Sandy, clayey gravel with brick*.
Raised Beach Deposits	Secondary A	Whole Site	1 to 2m	Quaternary	Sands and gravels.
Tidal River Deposits	Secondary A	Whole Site	1 to 2m	Quaternary	Silty and sandy clays with sands and gravels.
Upper Chalk	Principal	Whole Site	>65m	Cretaceous	White chalk with flints and marl beds.

* Whilst the geological map does not record near surface soil or made ground we have assumed that a superficial layer of made ground up to circa 1m thick is present below the areas of hard standing covering the majority of the site and/or topsoil/subsoil in areas of soft landscaping observed in the vicinity of the site.

The published geological records would appear to indicate that the site is located very close to the boundary of the raised beach deposits and the tidal river deposits, such that one, or both may be present on the site. Aeolian deposits (Brickearth comprising silt and gravel) are shown circa 100m to the E of the site.

3.2.2 BGS Borehole Records

Several BGS records exist for exploratory holes excavated in the vicinity of the site. Copies of the logs are presented in Appendix E and can be summarised as follows:-

- Borehole TQ00SW216 (ref Gas Works, Gloucester Road, Littlehampton) was located circa 150m to the S of the site and shows the following strata succession:-

Strata	Description	Thickness
Drift	Clay and flints.	2.3m
Upper Chalk	Chalk and flints.	>6.9m

*During a borehole test, resting groundwater was recorded at 2.44mbgl.

- Borehole TQ00SW15 (ref Littlehampton, New Bridge Road, BH18) was located circa 175m to the W of the site and shows the following strata succession:-

Strata	Description	Thickness
Topsoil	Topsoil.	0.3m
Brickearth	Firm brown, sandy clay and flints.	0.6m
Coombe Deposits	Firm brown, chalky clay with flints.	2.4m
Upper Chalk	Rubbly chalk.	>2.7m

*A groundwater strike was recorded at 3.96mbgl with standing water at 2.13mbgl on completion.

- Borehole TQ00SW72 (ref Electricity Works, Duke Street, Littlehampton) was located circa 450m to the SE of the site and shows the following strata succession:-

Strata	Description	Thickness
Drift	Clay and gravel (raised beach?).	3.6m
	Marl.	1.5m
	Gravel.	1.2m
Upper Chalk	Chalk and flints.	>24m

*Resting groundwater level was recorded at 4.5mbgl.

www.neviaPDF.com

© Terragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

In general, the BGS records corroborate the published geology. It is likely therefore that any near surface soil (topsoil, subsoil and/or made ground) at the site will be underlain by superficial drift deposits, comprising clay or sandy clay with gravel (flints) directly underlain by chalk. In general, groundwater was encountered at 2 to 5mbgl in the published borehole records reviewed and it would appear that any water within the superficial drift deposits will be in hydraulic continuity with water in the underlying bedrock (chalk).

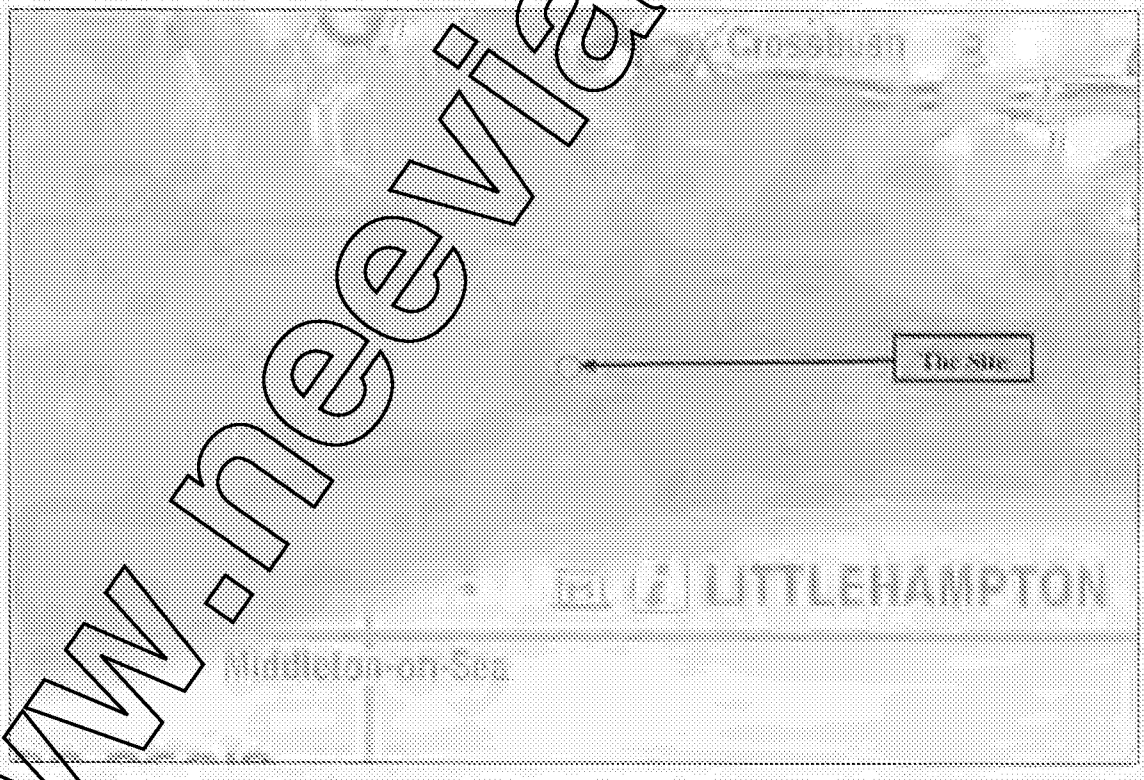
3.2.3 Other Ground Conditions

- The site is allocated low to very low to negligible ratings for a range of ground stability hazards.
- The site is within a Radon Affected Area as between 1% and 3% of homes are above the radon action level. However, the site is not in an area where radon protection measures are required for new properties or extensions as described in BRE Report BR211 and therefore no radon protective measures are considered necessary.
- The site is not listed as being within 75m of an area potentially affected by coal mining.

3.3 Controlled Waters

3.3.1 Hydrogeology and Groundwater

The superficial deposits located directly below and in the immediate vicinity of the site (raised beach deposits, tidal river deposits and Brickearth) are classified by the agency as a Secondary (A)* aquifer, as shown on the map below:-



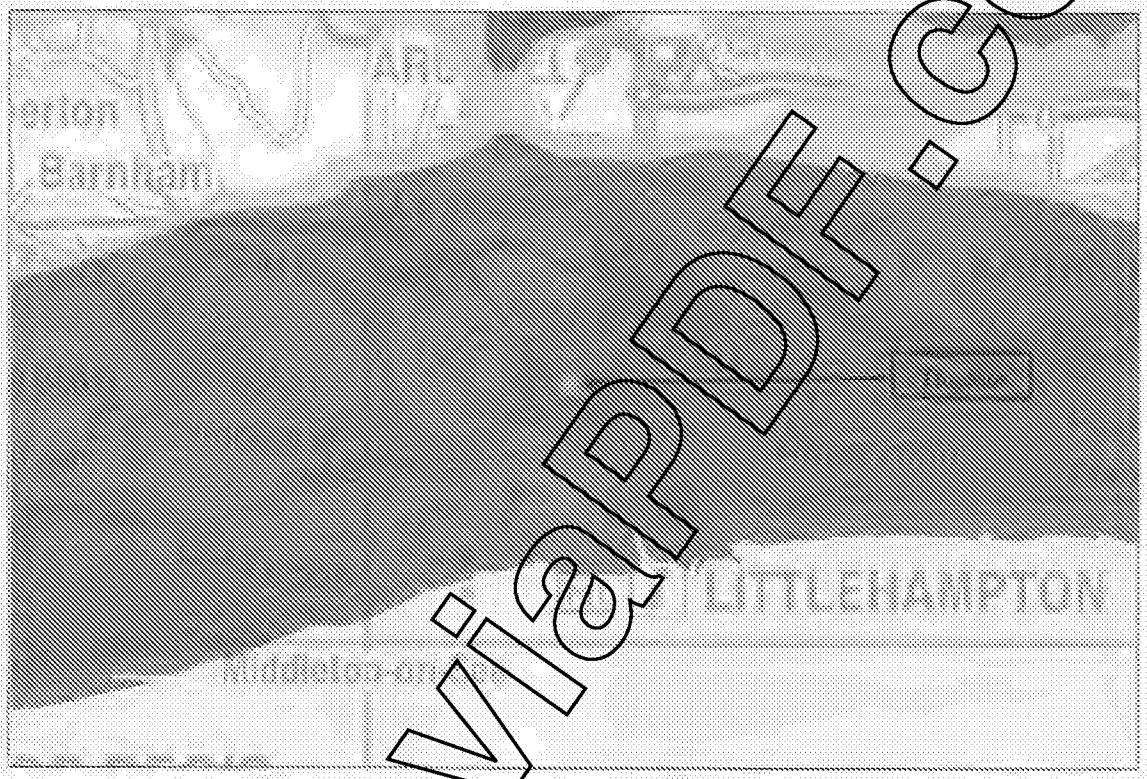
*Secondary (A) aquifers are defined by the agency as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

www.neviaPDF.com

© Terrogen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

The underlying bedrock (Upper Chalk) below the site and surrounds are classified by the agency as a Principal* aquifer, as shown on the map below:-



Principal Secondary A Secondary B Secondary (undifferentiated)

*Principal aquifers are layers of rock or drift deposits that have high inter-granular and/or fracture permeability meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

The river basin management plan (RBMP) for the South East region classifies the Littlehampton Anticline East aquifer as being of poor quantitative quality (current and predicted) although good chemical quality (current and predicted).

The site is not located in or within 500m of an agency designated source protection zone (SPZ) for potable water supply.

There is/are:-

- One (1) groundwater abstraction license listed within 1km of the site boundary, located circa 480m to the SW of the site with a usage of general/process washing. There are no abstraction licenses for potable supply listed within 2km of the site boundary.
- Two (2) surface water abstraction licenses listed within 1km of the site boundary, both relating to spray irrigation from the Ryebank Rife and Elmbank Rife circa 680 to 710m to the SW of the site.

www.neoviaDL.com

© Terrageo Environmental Consultants 2011

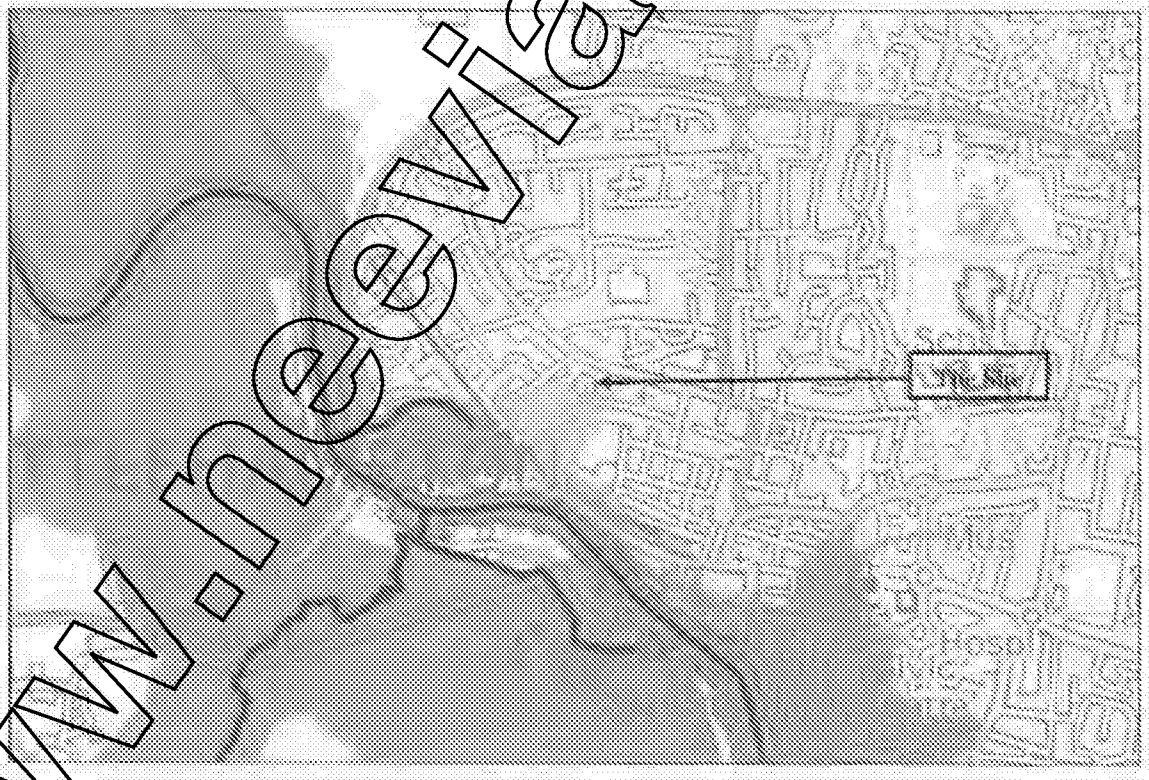
ARUN DISTRICT COUNCIL LU/363/14/PL

3.3.2 Hydrology and Surface Water Features

- Wick Farm Ditch, located circa 350m to the W of the site and Ryebank Rife circa 700m to the SW are classified as primary rivers. The River Arun (estuarine) is located circa 880m to the S of the site.
- There are several other un-named and undefined secondary rivers, culverts, drains and ditches within 500m of the site.
- There are no agency general quality assessment (GQA) monitoring points for river quality within 1.5km of the site.
- The RBMP (rivers) for the South East region classifies Ryebank Rife within the Arun and Western Streams catchment as a low, extra-small siliceous channel of moderate ecological potential (current and predicted) and not requiring chemical assessment (assumed therefore to be classified as a heavily modified channel).
- The RBMP (estuarine) for the South East region classifies the River Arun as being a partly mixed, macro, heavily modified channel of moderate ecological potential (current and predicted) and not requiring chemical assessment.

3.3.3 Flood Risk

The site is located in Zone 2 (tidal) of an agency indicative floodplain that is liable to flooding. This is shown graphically on the diagram below:-



Flooding from rivers or sea without defences
Extent of extreme flood

The site is also listed as being in an area with a very high susceptibility to groundwater flooding.

www.neviaPDF.com

© Terragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

3.4 Environmental Setting

3.4.1 Authorisations, Incidents and Registers

There is/are:-

- No entries in the Contaminated Land Register under Section 78R of the Environmental Protection Act 1990 Part IIA for the site or within 500m. The site is however considered as being potentially by the local authority due to its past industrial use, although it is low on the priority list as it is currently in commercial usage.
- Fifteen (15) licensed discharge consents within 250 to 500m of the site boundary. Six (6) relate to sewage discharges, six (6) are listed as miscellaneous and three (3) as trade discharges. The River Arun, un-named freshwater rivers and the sea are listed as the receiving waters.
- Eight (8) Part A(1) and IPPC authorised activities are listed within 500m of the site. Each are located circa 140m to the W of the site, the licenses for which have been superseded or transferred. The processes included waste landfilling (assumed to be transfer stations) and associated processes operated by Ethos Recycling Ltd, Medisort Ltd, Cliniserve Ltd and Ethos Medical and Special Waste Ltd.
- Five (5) Part A(2) and Part B activities and enforcements are listed within 500m of the site as detailed below:-

Process	Address	Status	Distance / Direction
Foundry	Fine Cast Foundry (A) Unit 1 Lineside Way, Littlehampton	Current	305m NW
Not Given	Arc (Southern) Ltd, Quayside	Revoked	385m SW
Not Given	Redland Aggregates Ltd, Quayside	Current	397m SW
Roadstone	Lafarge Redland Quayside	Unknown	419m SW
Concrete Crushing & Processing	Watson (Builders) Quayside	Unknown	487m SW

- The local authority records indicate that Tarmac Southern Ltd operate a permitted facility 350m to the SW of the site under EPR Section 3.5, Part B(e) for the production of coated roadstone.
- The British Gas site at Gloucester Road, Littlehampton, circa 200m to the SW of the site is listed on the Health and Safety Executive records as being a dangerous/hazardous site, at which two (2) records of planning hazardous substance consents exist relating to the gasholder station.
- Two (2) records for Category 3 or 4 radioactive substances licenses are listed within 500m of the site as detailed below:-

Type	Address	Status	Distance / Direction
Keeping & Use of Radioactive Materials	CM Wood Body Repair Centre, Linden Park	Current	197m SE
Keeping & Use of Radioactive Materials	RW Masters Coachworks, Unit A1 Riverside Industrial Estate	Current	365m SW

- One (1) recorded pollution of controlled water incident within 500m of the site boundary as detailed below:-

Date	Pollutant/Cause	Water Impact	Land Impact	Air Impact	Distance / Direction
26/02/2002	Atmospheric Pollutants	4 (No Impact)	3 (Minor)	3 (Minor)	35m SE

- Information provided by the local authority indicates that the incident at the site on 26/02/2002 related to a fire at the adjacent Verdant depot.

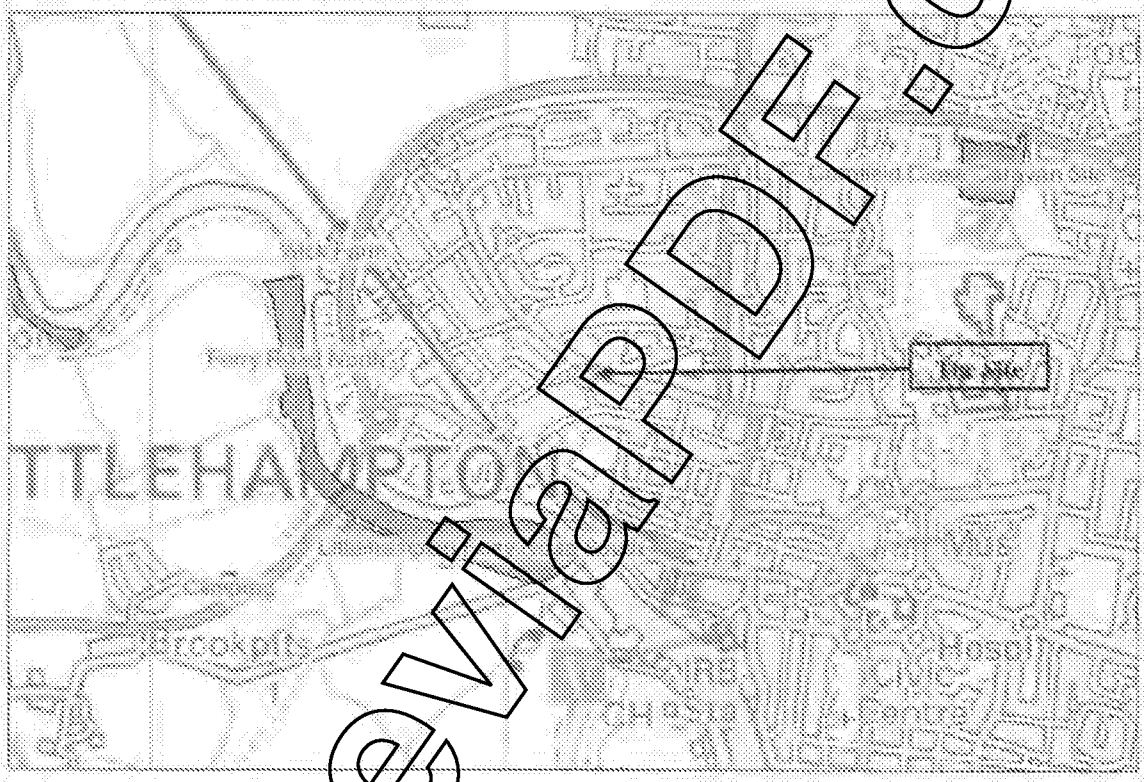
www.nawiaPDF.com

© Tarmac Environmental Consultancy 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

3.4.2 Landfill and Other Waste Sites

There are a no landfill sites (historic or operational) within 250m of the site boundary. There are no operational landfill sites within 1km of the site boundary. A number of historic landfills are located within the local area as shown on the map below:-



- Historic landfills within 500m of the site include:-
  - Littlehampton Ferry Road South was situated circa 405m to the S of the site and operated between 1946 and 1975 during which time it was permitted to receive inert, commercial and household waste.
- There are five (5) operational waste treatment and transfer sites within 80 to 500m of the site, four (4) of which are located within the Fort Road Industrial Estate to the N and W of the site and the fifth is located within the Lineside Industrial Estate to the W of the site.

www.neevia.com

© Tetra Tech Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

3.4.3 Current Land Uses

There is/are:-

- No contemporary trade directory entries listed for the site itself, although it is currently operated as a small-scale motor mechanics.
- A total of fifty six (56) contemporary trade directory entries for potentially contaminative industrial activities listed within 250m of the site boundary, which include:-

* Container and storage depot.	* Electricity sub-station.
* General manufacturing.	* Plate makers, print finishers and type setters.
* Vehicle repair, testing and servicing.	* Special purpose machinery and equipment.
* Rubber silicones and plastics.	* Works/factories.
* General construction supplies.	* Metalworkers (including blacksmiths).
* Packaging.	* Medical waste disposal services.
* Waste storage, processing and disposal.	* Electrical components.
* Textiles, fabrics, silk and machinery.	* Electronic equipment.
* Published goods.	* Electrical contractors.
* Horticultural equipment.	* Vehicle breakdown and recovery services.
* Business park/industrial estates.	* Gas features.
* Pest and vermin control.	* Cutting, drilling and welding services.
* Tanks (generic).	* Clothing.

- No fuel station entries listed within 250m of the site boundary.

3.4.4 Environmentally Sensitive Land Uses

A review of information provided on www.naturalengland.gov.uk, www.magic.gov.uk, www.ads.afore.ac.uk and local authority records shows the following:-

- A scheduled monument is located at Church Farm, circa 2km to the W of the site.
- Rural land-based schemes lists the agricultural land to the W of the River Arun as being under entry-level stewardship.
- The coastal and marine resource atlas for intertidal substrate foreshore (England and Scotland) designates the River Arun substrate as mud.
- We are not aware of any statutory or other rural designations relevant to the site, its surrounds or the proposed development.

www.neevia.PDF.com

© Terrapin Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

4.0 TIER 1 QRA

The following section summarises our Tier 1 QRA, culminating in the compilation of a preliminary CSM. The purpose of this section of the report is to identify and assess the potential risk and plausibility of sources of contamination, the presence of receptors sensitive to such contamination and pathways between the two, if present.

4.1 Potential Sources

4.1.1 Potential Sources of Contamination

The site has been used as a mechanics for over twenty (20) years and was formerly part of a depot and destructor works. Potential sources of contamination associated with the historic use have been identified at the site, including the following:-

- Potential on site AST (engine and lubricating oil etc.).
- Off site diesel UST.
- Vehicle parking across parts of the site.
- Vehicle inspection pit.
- Made ground of unknown origin and/or waste from the destructor works may have been used to make up levels at the site.

4.1.2 Areas of Potential Concern (AoPC)

Based on the potential sources of contamination identified at the site we can identify the following AoPC:-

- The whole site would be considered an AoPC in relation to historic commercial/industrial use. In particular, areas surrounding the mechanics, inspection pit, suspect former AST and vehicle parking may be impacted by fuel/oil leakage and/or spillage.
- The whole site may have been made up with materials/soils of unknown origin.
- Dependent upon the nature of the materials/soils used to make up levels and/or impacts from organic contaminants the whole site may be affected by/susceptible to on-site generation of ground gas and/or volatile organic compounds.
- The whole site may be impacted by potential migration of mobile contaminants from offsite leakage associated with the diesel UST at the adjacent depot.

4.1.3 Potential Contaminants of Concern (PCoC)

We have reviewed the list of potential contaminants given in the relevant DoE Profiles (1995) for road vehicle fuelling, service and repair (transport and haulage centres) in conjunction with the potential sources of contamination listed in Section 4.1.1. Therefore we would consider the following as PCoC:-

- Heavy metals.
- Asbestos.
- Total petroleum hydrocarbons (TPH).
- Polyaromatic hydrocarbons (PAH).
- BTEX.
- Methane (CH_4), carbon dioxide (CO_2) and volatile organic compounds (VOC).

4.2 Potential Receptors

Based on the information summarised in Section 3.0 and the proposed development plans presented in Figure 3, we would consider the following potentially sensitive receptors to be present at or adjacent to the site as a result of the proposed development:-

- End-users (residents).
- Site operatives.
- Flora and fauna.
- Groundwater (Secondary (A) and Principal aquifers).
- Surface water (River Arun, Wick Farm Ditch and Ryebank Rife).
- Buildings and construction materials.

© Terrogen Environmental Consultancy 2011

www.neoviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

4.3 Potential Pathways and SPL

In Sections 4.1 and 4.2 potential sources and receptors have been identified. In this section the significance of pathways that will potentially exist between the two as a result of the final development will be discussed and assessed in order to determine the presence of SPL.

4.3.1 Human Health SPL (End-Users / Residents)

We have based our assessment of the human health SPL on the following known facts and/or assumptions:-

- The proposed development comprises the construction of four (4) residential units with associated access roads and car parking.
- End-users are considered to comprise both adults and children.
- Private garden areas are included within the development, together with landscape planting in areas of communal open space around the perimeter of the site.

We have therefore adopted a conservative approach and where applicable for our Tier 1 QRA have selected a standard residential end-use scenario based on Environment Agency (2009c). In accordance with Environment Agency (2009c), the critical receptor for a residential site is taken to be a 6 year old female with an exposure duration considered over a lifetime. In choosing the most sensitive on-site human health risk scenario this also adequately accounts for off-site human health exposure scenarios. The standard human health SPL are as presented in the table below:-

SPL	Human Health	End-User
1	Direct soil ingestion.	✓
2	Direct soil derived indoor dust ingestion.	✓
3	Consumption of site-grown vegetables.	✓
4	Indirect ingestion via site grown vegetables.	✓
5	Skin contact with soil-derived indoor dust.	✓
6	Skin contact with soil.	✓
7	Inhalation of soil derived indoor dust.	✓
8	Inhalation of soil derived outdoor dust.	✓
9	Inhalation of soil vapours indoors.	✓
10	Inhalation of soil vapours outdoors.	✓

✓ SPL Present ✗ SPL Absent

It should be noted that the human health SPL do not include a contribution from direct exposure to surface waters or shallow groundwater used for abstraction. It is therefore assumed that there will be no on-site abstractions for drinking, cooking or washing. It is also considered unlikely for end-users to come into contact with groundwater.

Disturbances to subsurface soil are likely to occur during construction works. The CLEA model is designed on the basis of chronic effects associated with frequent exposure over a number of years and as such is not appropriate for assessing the potential effects of an increased incidence of exposure over a relatively short period of time that will be experienced by a construction worker. Potential effects of this scenario should be managed through the use of appropriate Health and Safety controls in accordance with UK regulations and best industry practice (e.g. the use of appropriate PPE).

4.3.2 Flora and Fauna SPL

Whilst the development plan presented in Figure 1 does not specify the exact nature of the proposed soft landscape planting, it is assumed that the majority of the landscaped areas will be laid to lawn with semi-mature to mature trees planted around the perimeter. The potential presence of phytotoxic elements (those that pose a risk to plant health) within the near surface materials at the site (e.g. copper, nickel and zinc) and soil reaction (pH) or the presence of hydrocarbons, which impede the

© Terragen Environmental Consultancy 2011

www.regpdf.com

ARUN DISTRICT COUNCIL LU/363/14/PL

uptake of water by plant roots, may have the potential to impede the growth of sensitive amenity species used in the landscape planting scheme, where in-situ soils are either planted directly into or re-used within the scheme allowing root uptake of soluble fractions.

SPL	Flora/Fauna	Vegetation
11	Root uptake of soluble contaminants in surface soils.	✓

✓ SPL Present * SPL Absent

4.3.3 Groundwater SPL

The site is located directly above a secondary aquifer (raised beach/tidal/river deposits), which are likely to be in hydraulic continuity to a principal aquifer (chalk), although the site is not located in or within 500m of an agency designated SPZ. The nearest groundwater abstraction is circa 458m to the SW of the site.

SPL	Controlled Waters Exposure	Groundwater
12	Leaching of contaminants from within the soil via vertical infiltration to a principal aquifer.	✓
13	Leaching of contaminants from within the soil via vertical infiltration to a secondary aquifer.	✓

✓ Pathway Present * Pathway Absent

4.3.4 Surface Water SPL

The nearest surface water feature would appear to be circa 350m to the W of the site with various commercial and industrial activities in the intervening area. It is possible that any mobile contamination generated at the site may migrate laterally via the underlying groundwater to this or other surface water features, which may be in hydraulic continuity with the secondary and therefore principal aquifer.

SPL	Controlled Waters Exposure	Surface Water
14	Horizontal migration of impeded perched water to surface water courses.	✓

✓ Pathway Present * Pathway Absent

4.3.5 Buildings and Construction Materials SPL

Based on the latest UK guidance from BRE, CIRIA and NHBC etc., some types of contaminants associated with made ground, former industrial activities and some natural strata (e.g. heavy metals, organic compounds, cyanides and sulphates) could potentially have a detrimental effect on construction materials, such as below ground concrete structures, pipework/services and membranes through direct contact. In addition to this, volatile compounds and ground gases may potentially migrate through permeable below ground strata and accumulate in void spaces (e.g. rooms and cavity spaces), where they can be considered to pose a risk to the buildings through potential flammability/explosivity.

SPL	Buildings/Construction Materials Exposure	Buildings/Construction Materials
15	Direct contact of aggressive chemical contaminants with subsurface building materials.	✓
16	Migration of ground gases within permeable strata accumulating in void spaces.	✓

✓ SPL Present * SPL Absent

The potential for made ground to be present combined with the previous activities (e.g. vehicle refuelling, repair and servicing etc.), an off site UST and the potential for in-filled ground associated with the historic destructor works on site would result in the potential for on-site and off-site SPL to exist for scenario 15 and 16.

© Terraget Environmental Consultants 2011

www.neWPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

4.4 Preliminary CSM & Risk Assessment

The table below presents a preliminary CSM for the site based upon the historic and contemporary information reviewed and summarises in a tabular form the relevant sources, pathways and receptors on the site that may be associated with the proposed development.

	Source(s)	Shallow Soils	Deep Soils	Groundwater	Shallow Soils	Shallow Soils	Shallow Soils	Shallow Soils	Shallow Soils
Pathway(s)	1) Direct Soil Ingestion	✓	×	×	×	×	×	×	×
	2) Direct soil-derived indoor dust ingestion	✓	×	×	×	×	×	×	×
	3) Consumption of site-grown vegetables	✓	×	×	×	×	×	×	×
	4) Indirect ingestion via site-grown vegetables	✓	×	×	×	×	×	×	×
	5) Skin contact with soil-derived indoor dust	✓	×	×	×	×	×	×	×
	6) Skin contact with soil	✓	×	×	×	×	×	×	×
	7) Inhalation of soil-derived indoor dust	✓	×	×	×	×	×	×	×
	8) Inhalation of soil-derived outdoor dust	✓	×	×	×	×	×	×	×
	9) Inhalation of soil vapours indoors	✓	×	×	×	×	×	×	×
	10) Inhalation of soil vapours outdoors	✓	×	×	×	×	×	×	×
	11) Root uptake of soluble contaminants within [illegible]	×	×	×	✓	×	×	×	×
	12) Vertical leaching of contaminants to a [illegible] aquifer	×	×	×	×	✓	×	×	×
	13) Vertical leaching of contaminants to a secondary aquifer	×	×	×	×	✓	×	×	×
	14) Horizontal migration of groundwater to controlled surface water	×	×	×	×	×	✓	×	×
	15) Direct contact with surface soils	×	×	×	×	×	×	✓	✓
	16) Migration/accumulation of volatile [illegible] gas/ground gases	×	×	×	×	×	×	✓	×
	Receptor(s)	End-Users		Flora & Fauna	Groundwater	Surface Water	Buildings	Construction Materials	

✓ Pathway Present × Pathway Absent

It should be noted that exposure pathways from deep soils (>1mbgl) and inorganic compounds within the groundwater (i.e. metals) and semi-volatile organic compounds with a Henry's Law Constant less than 1E $^{-05}$ atm-m^3/mole (i.e. certain PAH) have not been considered with regards to human health.

In our opinion, the risk of potentially significant harm being caused to potentially sensitive receptors by the impact of the potential environmental hazards identified at or surrounding the site in its current state with regards to the proposed end-use is deemed to be **MODERATE**.

In our opinion the risk of the site being classified as contaminated land by the local authority under the provisions of the statutory guidance made under Part IIA of the Environmental Protection Act (1990) is **LOW**.

www.neeviaPDF.com

© Tetragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

5.0 CONCLUSIONS AND RECOMMENDATIONS

The risk attributed to the potential for contamination to exist at the site is considered to be moderate. Due to the presence of potential sources of contamination (i.e. AST, off site USTs and near surface soils potentially impacted by current, and past activities), sensitive receptors and plausible pathways between the two, we would recommend that a Phase 2 site investigation be undertaken to confirm this qualitative assessment and where necessary in conjunction with a Tier 2 GQRA refine the preliminary CSM, the conclusion of which should then determine the requirement for remedial measures to be incorporated into the development.

5.1 Additional Works

On the assumption that planning permission is granted for the proposed development at the site and in order to address the likely requirements of any conditions we would recommend that an intrusive investigation be undertaken in accordance with BSI (2001) etc. to confirm the nature, significance and extent of potential contamination in the near surface soil below the site, which should comprise the following:-

- Excavation of circa six (6) to eight (8) exploratory holes (i.e. circa 10 to 15m grid) through the full depth of any made ground encountered into the underlying natural ground to provide general coverage across the site.
- Where necessary, excavation of additional exploratory holes in the AoPC (e.g. around AST and mechanics workshops etc.) to intercept the underlying secondary aquifer to determine the potential for hydrocarbon contamination at greater depth.
- In-situ monitoring (e.g. volatile organic compounds using a PID).
- Recovery of representative samples (near surface soil and underlying natural strata) from across the site.
- Laboratory analysis of solid and leachable compounds in accordance with those listed in Section 4.1.3.
- A proportion of the boreholes (circa 4) to be installed with standpipes equipped with gas (vapour) and/or groundwater monitoring facilities. This should be followed by a programme of gas monitoring comprising circa six (6) visits over a period of three (3) months during which time at least two monitoring visits should be conducted at low and falling atmospheric pressure to characterise risks from ground gas.
- One (1) round of groundwater samples should be recovered from the boreholes and submitted for testing to include the PoCs identified in Section 4.1.3.
- Tier 2 GQRA of data generated from the analysis of samples (soils, leachates, water and gas) from the investigation against generic assessment criteria (GAC) based on the chosen end-use scenario model.
- Refinement of the preliminary CSM through a semi-quantitative risk assessment.
- Identification of the need for remediation and/or scope of additional works (e.g. one or more return visits to carry out a programme of gas (vapour) and/or groundwater monitoring, during which time representative samples of groundwater from the secondary aquifer may be recovered and tested for potential contaminants associated with the past use of the site, a DQRA etc.), if required.
- As the site is located in Zone 2 (tidal) of an agency designated floodplain, it is considered likely that a flood risk assessment (FRA) will be required.
- A pre-demolition asbestos survey may be required prior any demolition commencing.

Due to the current operational status of parts of the site it may be advisable to carry out the intrusive investigation after the current occupiers have vacated and/or demolition has been completed to allow full and unimpeded access to the whole site.

5.2 Regulatory Approval

We would recommend that formal approval be sought from the local authority, and/or the agency with regards to the recommendations contained within this report prior to commencing future phases of investigation and/or development of the site.

© Tertagen Environmental Consultants, 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

www.ingevi.pdf.com

6.0 LIMITATIONS AND USE OF THIS REPORT

IMPORTANT: This section should be read before reliance is placed on any of the opinions, advice, recommendations or conclusions set out in this report.

a) This report has been prepared for the purpose of providing advice to the client pursuant to its appointment of Terragen Environmental Consultants Limited (TGEN) to act as a consultant.

b) Save for the client no duty is undertaken or warranty or representation made to any party in respect of the opinions, advice, recommendations or conclusions herein set out.

c) All work carried out in preparing this report has used, and is based upon, our professional knowledge and understanding of the current relevant English and European Community standards, approved codes of practice, technology and legislation.

d) Changes in the above may cause the opinion, advice, recommendations or conclusions set out in this report to become inappropriate or incorrect. However, in giving its opinions, advice, recommendations and conclusions, TGEN has considered pending changes to environmental legislation and regulations of which it is currently aware. Following delivery of this report, we will have no obligation to advise the client of any such changes, or of their repercussions.

e) TGEN acknowledges that it is being retained, in part, because of its knowledge and experience with respect to environmental matters. TGEN will consider and analyse all information provided to it in the context of our knowledge and experience and all other relevant information known to us. To the extent that the information provided to us is not inconsistent or incompatible therewith, TGEN shall be entitled to rely upon and assume, without independent verification, the accuracy and completeness of such information.

f) The content of this report represents the professional opinion of experienced environmental consultants. TGEN does not provide specialist legal advice and the services of lawyers may be required.

g) In the summary and recommendations sections of this report, TGEN has set out our key findings and provided a summary and overview of our advice, opinions and recommendations. However, other parts of this report will often indicate the limitations of the information obtained by TGEN and therefore any advice, opinions or recommendations set out in the executive summary, summary and recommendations sections ought not to be relied upon unless they are considered in the context of the whole report.

h) The assessments made in this report are based on the ground conditions as revealed by walkover survey and/or intrusive investigations, together with the results of any field or laboratory testing or chemical analysis undertaken and other relevant data which may have been obtained including previous site investigations. In any event, ground contamination often exists as small discrete areas of contamination (hot spots) and there can be no certainty that any such areas have been located and/or sampled.

i) There may be special conditions pertaining to the site which have not been taken into account in the report. The assessment may be subject to amendment in light of additional information becoming available.

j) Where any data supplied by the client or from other sources, including that from previous site investigations, have been used it is assumed that the information is correct. No responsibility can be accepted by TGEN for inaccuracies within the data supplied by other parties.

k) Whilst the report may express an opinion on possible ground conditions between or beyond trial pit or borehole locations, or on the possible presence of features based on either visual, verbal or published evidence this is for guidance only and no liability can be accepted for the accuracy thereof.

l) Comments on groundwater conditions are based on observations made at the time of the investigation unless otherwise stated. Groundwater conditions may vary due to seasonal or other effects.

m) This report was prepared and written in the context of the agreed scope of work and should not be used in a different context. Furthermore, new information, improved practices and changes in legislation may necessitate a reinterpretation of the report in whole or part after its original submission.

n) The copyright in the written materials shall remain the property of the TGEN but with a royalty-free perpetual license to the client deemed to be granted on payment in full to TGEN by the client of the outstanding amount.

o) These terms apply in addition to the TGEN standard terms of engagement (or in addition to another written contract which may be in place instead thereof) unless specifically agreed in writing. (In the event of a conflict between these terms and the said standard terms of engagement the said standard terms of engagement shall prevail). In the absence of such a written contract the standard terms of engagement will apply.

© Terragen Environmental Consultants 2011

www.neighbourlydt.com

Figure 1 Site Location and Proposed Development Plan.

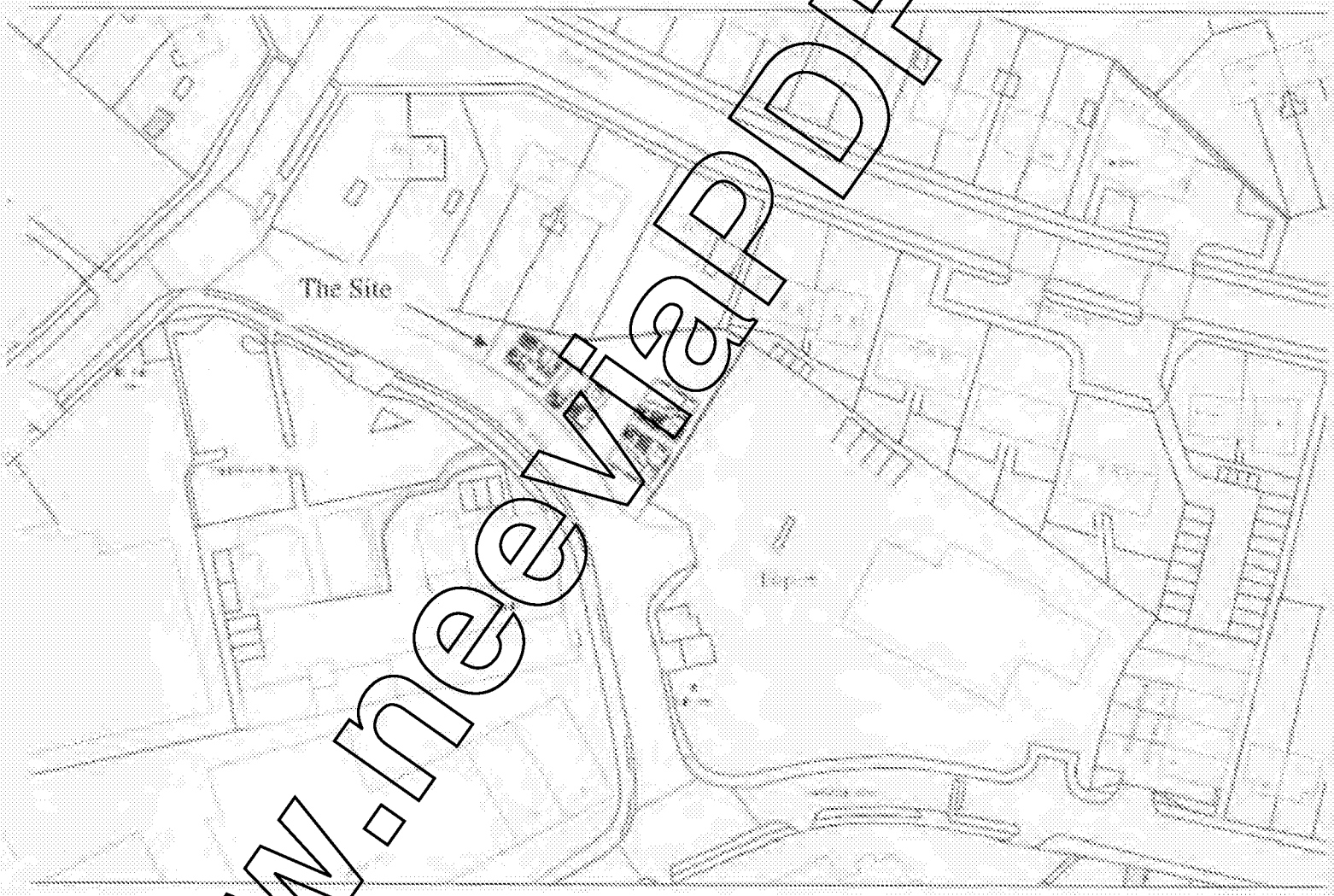
www.neeviaPDF.com

© Tetragen Environmental Consultants 2011

gn and Build

Fort Road Garage, Fort Road East, Littlehampton, West Sussex, BN17 7QZ

Site Location Plan



© Tarragon Environmental Consu

www.neviaPDF.com

Appendix A Contaminated Land Investigation Protocol.

www.neeviaPDF.com

© Terragen Environmental Consultants 2011

CONTAMINATED LAND RISK ASSESSMENT

1.0 INTRODUCTION

Part IIA of the Environmental Protection Act (1990) introduced a statutory definition for contaminated land, as follows:-

"...any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land , that :-

a) significant harm is being caused or there is a significant possibility of such harm being caused, or

b) pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused"

The United Kingdom (UK) government's objectives with respect to contaminated land are:-

* To identify and remove unacceptable risks to human health and the environment
* To seek to bring damaged land back into beneficial use
* To seek to ensure that the cost burdens faced by individuals, companies, and society as a whole are proportionate, manageable and economically sustainable

These three objectives underlie the fitness for purpose approach to remediation of contaminated land within the UK. The fitness for purpose approach consists of three elements:-

(a) Ensuring that land is suitable for its current use - in other words, identifying any land where contamination is causing unacceptable risks to human health and the environment, assessed on the basis of the current use and circumstances of the land, and returning such land to a condition where such risks no longer arise (remediating the land); the contaminated land regime (Part IIA) provides general machinery to achieve this;

(b) Ensuring that land is made suitable for any new use, as planning permission is given for that new use - in other words, assessing the potential risks from contamination, on the basis of the proposed future use and circumstances, before official permission is given for the development and, where necessary to avoid unacceptable risks to human health and the environment, remediating the land before the new use commences; this is the role of the town and country planning and building control regimes; and

(c) Limiting requirements for remediation to the work necessary to prevent unacceptable risks to human health or the environment in relation to the current use or future use of the land for which planning permission is being sought - in other words, recognising that the risks from contaminated land can be satisfactorily assessed only in the context of specific uses of the land (whether current or proposed), and that any attempt to guess what might be needed at some time in the future for other uses is likely to result either in premature work (thereby risking distorting social, economic and environmental priorities) or in unnecessary work (thereby wasting resources).

Most remediation of land contamination in the UK takes place when a site is redeveloped for a new use. Conditions requiring remediation are normally attached to the planning consent. Where no redevelopment is proposed, a remediation notice can be served under the contaminated land regime introduced under Part IIA of the Environmental Protection Act 1990. Government policy is to encourage voluntary remediation of contamination through site redevelopment wherever possible rather than regulation under the contaminated land regime.

www.neviaPDF.com

© Terrogot Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

The basis of an environmental risk assessment involves:-

* Identifying a **source** of contamination.
* Identifying a **pathway**/media through which the contamination may migrate.
* Identifying a **receptor** or target at risk from the contamination.

The site can only be designated as contaminated land if there is a significant pollutant linkage (SPL) i.e. a source of contamination, a plausible pathway and a sensitive receptor.

The source-pathway-receptor model used to assess sites is widely accepted in the industry however it does not take into account less scientific factors such as perceived risk.

The list of statutory and non-statutory guidance documents, regulations, reports, models, tools and standards used by TGEN to plan, undertake, risk assess and report site investigations for contaminated land are presented in Section 6 of this appendix.

1.1 General Approach

The general approach to risk assessment adopted for the investigation of contaminated land within UK policy framework is based on a generic quantitative risk assessment (GQRA) of data generated during a site investigation against compliance criteria based on generic assessment criteria (GAC) derived using an appropriate tool.

1.2 Assessment Criteria

Two criteria are used for the selection of potential contaminants to test for during a ground investigation, as follows:-

* Contaminants must be likely to be present on many sites affected by current or former industrial use in the UK in sufficient concentrations to cause harm. The purpose of this criterion is to exclude substances that are rarely found or are unlikely to be present in harmful concentrations.
* Contaminants must pose a potential risk to human beings and to sensitive environmental receptors, i.e. the water environment, the ecosystem or the integrity of construction or building materials.

Only substances meeting both of the above criteria are selected for chemical analysis. Therefore, the selected substances are:

* Likely to occur on many industrial sites in sufficient concentrations to cause harm or pollution.
* Known or suspected to pose significant risk to humans (death, serious injury, cancer or other disease, genetic mutation, birth defects or the impairment of reproductive functions).
* Known or suspected to pose a significant risk in the water environment, or likely to cause other adverse impacts in the water environment, as a result of their presence on land.
* Known or suspected to pose a significant risk to ecosystems as a result of their presence on land.
* Known or suspected to have a significant effect on buildings or building materials.
* Known or suspected to be persistent and mobile in soils or have tendency to bio-accumulate through exposure of sensitive organisms.

The following documents are the primary sources for identifying those contaminants likely to be present:-

* Environment Agency (2002) identified priority contaminants, selected on the basis that they are likely to be present on many current or former sites affected by industrial or waste management activity in the UK in sufficient concentrations to cause harm.
* DoE (1995a) describe specific industrial processes and the chemicals that are commonly found on industrial land.

www.nqoviaPDF.com

© Terrogen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

www.neeviaPDF.com

© Tetragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

2.0 HUMAN HEALTH RISK ASSESSMENT

2.1 Risk Assessment Approach

The approach to risk assessment with respect to the assessment of potential risk to human health from contaminated land in the UK is set out in Environment Agency (2004).

This sets out a tiered approach:-

- Tier 1 Qualitative Risk Assessment (QRA) i.e. establishing potential pollutant linkages.
- Generic Quantitative Risk Assessment (GQRA) i.e. the comparison of contaminant concentrations against SGV or other GAC.
- Detailed Quantitative Risk Assessment (DQRA) i.e. the comparison of contaminant concentrations against site specific assessment criteria (SSAC).

2.1.1 Tier 1 QRA

Information relating to the potential sources of contamination is normally obtained through a study of available documents and evidence, including current and historical land use, database survey, correspondence with regulatory authorities, site walkover survey and an assessment of the results derived from previous intrusive investigations at the site, commonly termed a desk study in order to identify any areas of potential concern (AoPC) that could be classed as potential sources.

The environmental setting information relates to the potential pathway and receptor stages. The information collected as part of the Tier 1 QRA is then used to construct a preliminary conceptual site model (CSM) to identify potentially significant pollutant linkages (SPL).

TGEN use the term Phase 1 site survey to describe the works undertaken to allow the construction of the preliminary CSM.

The potentially active SPL identified in the CSM are then assessed in terms of the potential risk of harm to the identified receptors through a combination of the probability of occurrence and the potential severity of the consequence. The assigned risk takes into account the potential for regulatory or third party liability, the potential for affecting value and saleability and the potential for extraordinary environment related development costs. The Tier 1 QRA risk matrix summarised below is based on guidance contained in CIRIA (2001). Definitions of the risk classifications presented in the guidance are as follows:-

Risk Matrix		Severity of Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability of Pollutant Linkage	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Low/Moderate Risk
	Likely	High Risk	Moderate Risk	Low/Moderate Risk	Low Risk
	Low Likelihood	Moderate Risk	Low/Moderate Risk	Low Risk	Very Low Risk
	Unlikely	Low/Moderate Risk	Low Risk	Very Low Risk	Very Low Risk

Very High Risk – There is a high probability that severe harm could arise to a designated receptor from an identified source; or there is evidence that severe harm to a designated receptor is currently happening.

High Risk – Harm is likely to arise to a designated receptor from an identified source.

Moderate Risk – It is possible that harm could arise to a designated receptor from an identified source. It is relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild.

© Terrogen Environmental Consultants 2011

www.nqevia.pdf.com

ARUN DISTRICT COUNCIL LU/363/14/PL

Low Risk – It is possible that harm could arise to a designated receptor from an identified source, but it is unlikely that this harm, if realised, would at worst normally be mild.

Very Low Risk – There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

2.1.2 Tier 2 GQRA

If necessary an intrusive site investigation together with suitable chemical analysis of soil, leachate and/or water samples, ground gases etc. is designed and implemented in order to gather sufficient information to provide quantification of the risks identified within the Tier 1 QRA.

The information gathered as part of the intrusive investigation is then compared against GAC to assess links within the source-pathway-receptor model and as part of the Tier 2 GQRA a refined CSM can then be produced to assess the identified risks. Remedial measures and/or further works are then designed to either mitigate or further assess the identified risks.

TGEN use the term Phase 2 site survey to describe the works undertaken to allow the construction of the refined CSM.

2.1.3 Tier 3 DQRA

Where necessary, the information gathered as part of the site investigation (and supplemented with additional information) can be compared against SSAC, in order to fully rationalise any identified risks. The outcome of the DQRA may be that the risk is not significant or, if the risk is identified as being significant, the generation of site-specific remedial targets will be required. Where SSAC are significantly exceeded remedial measures may be required immediately.

There are a wide range of remedial methods available, with the method chosen being dependent upon the contaminant(s) identified, the site conditions, the proposed development, timescales and budget available. The simplest remediation method that is generally accepted for contamination that has been identified to pose a potential risk to humans, but not to other receptors, is to provide a barrier between occupiers / users of a site and the identified contamination. This barrier normally comprises a clean covering horizon of soil. This remediation method is only suitable for contaminants that are of low volatility and or mobility.

In accordance with UK policy and where feasible the removal of soil from site is minimized and disposal off-site as waste to landfill is considered as a last resort.

2.2 Generic Quantitative Risk Assessment

In order to undertake a GQRA, contaminant concentrations need to be compared to appropriate GAC. Current industry practice is to use, as first preference, SGV published by the Environment Agency (the agency) and derived using the CLEA model.

The CLEA model provides an approach for the assessment of chronic risks to human health from concentrations of a substance within soil, where appropriate.

The current version of the model (v1.06) was published in 2009 and, following its publication, a number of SGV have also been produced. However, the SGV published to date are only for a limited number of contaminants. Where published SGV do not exist, other published GAC values derived from a risk-based assessment of human toxicological and/or ecotoxicological data have been utilised in accordance with the following hierarchy:-

- GAC prepared in accordance with the CLEA v1.06 model by authoritative bodies (e.g. CL:AIRE, CIEH, EIC).
- TGEN in-house GAC prepared in accordance with the CLEA v1.06 model and associated documents.

© Terragen Environmental Consultancy 2011

www.neoviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

2.3 TGEN Approach

The approach adopted by TGEN has been to generate GAC for chronic risks to human health using CLEA v1.06. In generating GAC, input parameters consistent with the most recent agency publications have been adopted (see Section 6).

2.3.1 Substance Specific Information – Health Criteria Values

Toxicological data for respective contaminants have been chosen for use based on the guidance in Environment Agency (2009a). Where UK guidance is available (i.e. existing published TOX reports) the appropriate health criteria values (HCV) have been adopted. Where no TOX report is available the following approaches has been used (given in order of preference):-

* Published toxicity reviews to derive HCV within CIEH (2009).
* Other appropriate UK sources.
* Authoritative European sources.
* International Organisations (e.g. World Health Organisation).
* Appropriate, authoritative US sources (e.g. USEPA).

2.3.2 Substance Specific Information – Physico Chemical Characteristics

Fate and transport characteristics for the contaminants for which GAC have been derived were chosen using the following hierarchy of data sources:-

* Environment Agency (2008a).
* Environment Agency (2003).
* Other UK Government documents.
* European data sources (e.g. NIPHE 2001).
* International data sources (e.g. WHO and USEPA).

2.3.3 Model Settings

In the generation of GAC, default settings have been used for the following exposure scenarios:-

* Residential with Plant Uptake.
* Residential without Plant Uptake.
* Allotments.
* Commercial/Industrial.

The default soil type is set as sandy loam with a pH of 7. A soil organic matter of 1%, 3% and 6% have been considered.

2.3.4 Soil Saturation

With the exception of petroleum hydrocarbon fractions, GAC have been limited to the calculated soil saturation limit for organic species, which is in accordance with the approach taken by the agency in the production of SGV. Petroleum hydrocarbon fractions are assessed, where appropriate, based on Hazard Index and so have not been limited to soil saturation.

2.3.5 Cyanides

The primary risk to human receptors from free cyanide in soils is an acute risk (i.e. a single dose could have a lethal affect as opposed to adverse affects from cumulative intake (chronic affect)).

There is no current UK guidance available for calculating acute risks from free cyanide, therefore the (formally withdrawn) SNIFFER (2003) methodology has been used to derive an acute GAC of 60 mg/kg for all exposure scenarios. The value is given for free or easily liberatable cyanide but can be used to

© Tetragen Environmental Consultants 2011

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

assess total cyanide in the absence of cyanide speciation. In cases where the total cyanide exceeds the GAC then analysis of free or easily liberatable cyanide is completed.

2.3.6 Limitations of the CLEA Model

In the application of GAC (and SGV) to a site TGEN recognises the limitations of the CLEA model. Specifically these relate to the absence of certain pollutant considerations such as risks to services, of fire and explosion, aesthetics, institutional perception, groundwater, surface waters, ecotoxicological risk and risks to buildings (amongst others).

In addition, the GAC specifically do not meet the requirements of the legal definition of significant possibility of significant harm but provide a benchmark below which concentrations of contaminants are not considered to warrant further consideration in the context of the land use scenario.

The CLEA model also does not explicitly consider the potential for chronic impact to human health from indoor inhalation of concentrations of volatile vapours from dissolved phase contamination. The potential exists for this to be an important exposure route for a limited number of highly volatile contaminants. As such, GAC have been calculated for volatile contaminants for volatilisation from groundwater using RISC 4. It should be noted that the RISC 4 approach does not include advection into buildings and we consider alternative approaches where this is likely to be a significant issue.

Exposure factors required for the model have been derived using the information contained within Environment Agency (2009a,b). Where ranges of values are provided for input parameters, an appropriate conservative single value has been chosen for input into the RISC 4 model. The following table details the receptor exposure factors used in the RISC 4 model to generate the GAC.

Receptor Parameters	Unit	Residential	Source	Commercial	Source
Lifetime	yr	6	Environment Agency (2009a) Section 3.2.3	49	Environment Agency (2009a). Section 3.4.1
Body weight	kg	13.2	Environment Agency (2009b). Table 3.2 average over age 0-6 considering child age 0-1 has 0.5yr exposure	70	Environment Agency (2009b). Section 4.1
Exposure frequency for indoor air	days/yr	365	Environment Agency (2009a). Table 3.1	230	Environment Agency (2009a) Table 3.9
Exposure duration for indoor air	yr	6	Environment Agency (2009a). Section 3.2.3	49	Environment Agency (2009a) Section 3.4.1
Lung retention factor	fraction	1	Conservative assumption	1	Conservative assumption
Inhalation rate indoors	m^3/hr	0.5	Environment Agency (2009a). Calculated average from Table 4.14	0.56	Environment Agency (2009a). Calculated average from Table 4.14
Time indoors	hr/day	21.7	Environment Agency (2009a). Table 3.2	8.3	Environment Agency (2009a). Box 3.6
Bioavailability for all contaminants	%	100	Default conservative assumption	100	Default conservative assumption

www.neevia.com

© Terragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

Default building parameters that have been utilised in the generation of the groundwater GAC values as presented in the following table:-

Building Parameters	Unit	2-storey small terrace house	Source	Pre-1970, 3-storey office	Source
Cross sectional area of building	m^2	28	Environment Agency (2009a), Table 3.3	424	Environment Agency (2009a), Table 3.10
Volume of building	m^3	134.4	Environment Agency (2009a), Table 3.3	4770.4	Environment Agency (2009a), Table 3.10
No. of air exchanges per day	no.	12	Environment Agency (2009a), Table 3.3	24	Environment Agency (2009a), Table 3.10
Thickness of basement or foundation walls	m	0.15	Environment Agency (2009a), Table 3.3	0.15	Environment Agency (2009a), Table 3.10
Fraction of the foundation that are cracks	Fraction	0.001429	Environment Agency (2009a). Floor crack area as a fraction of total floor area	0.000350	Environment Agency (2009a). Floor crack area as a fraction of total floor area
Porosity of foundation cracks	Factor	1	Assumes crack fraction is entirely available for vapour ingress	1	Assumes crack fraction is entirely available for vapour ingress
Water content in foundation cracks	cm3/cm3	0	Conservative assumption	0	Conservative assumption

In the absence of UK guidelines, the exposure scenario adopted has considered a groundwater source 0.5m below the base of the building as a conservative approach representing an example of a very shallow aquifer and corresponding with the depth of a soil source as adopted in the generic scenario in the CLEA model. The appropriateness of this assumption is assessed on a site by site basis considering the conceptual model for the site. The groundwater model parameters are presented in the following table:-

Groundwater Parameters	Units	Value	Source
Distance to building foundation from groundwater	m	0.50	Environment Agency (2009a), Page 51
Total porosity in source zone	cm^3/cm^3	0.53	Environment Agency (2009a), Table 4.4 (i.e. sandy loam)
Water content in source zone	cm^3/cm^3	0.33	Environment Agency (2009a), Table 4.4 (i.e. sandy loam)
Thickness of capillary fringe	cm	10	Estimate
Air content in the capillary fringe	cm^3/cm	0.01	Estimate

For many contaminants, no risk is calculated at concentrations below the pure phase solubility of the contaminant. Caution is applied when non-aqueous phase liquids (NAPL) are likely to be present, either where these have been detected during monitoring or where the concentration of a component in a mixture exceeds 10% of its calculated effective solubility. In such cases a separate assessment of the generation of volatile vapours from NAPL via modelling or a soil vapour survey may be undertaken.

It is important to note that the values are only applicable to human health and cannot be used to determine the potential risks to controlled waters.

www.neaviaPDF.com

© Tarmac Environment & Consultancy 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

2.4 Use of Statistical Tests in Data Interpretation

A statistical basis for the assessment of the analytical results obtained during the site investigation is detailed within CL:AIRE (2008). The premise is to review an entire data set in an appropriate way in comparison to SGV/GAC. The assumption made is that the results from the site investigation are to some degree representative of the contaminant concentration throughout that area or volume of soil represented by the sample or samples. The most appropriate method for assessing a given dataset is dependent upon a range of site specific factors together with the quantity and quality of the data generated and the chosen approach differentiated for datasets where random or targeted sampling has been undertaken and where a site is being considered in a planning or Part 2A context.

In accordance with the recommendations provided within CL:AIRE (2008) where appropriate we select the one sample t-test (same as the mean value test described in CLR7) at a 95% confidence level as the most appropriate statistical tool for generating site representative soil concentration values in instances where it is assumed that the data is normally distributed and where the test is required to draw conclusions about the condition of the land under scrutiny as part of a planning scenario (whereby comparison is made between a value larger than the sample mean, in this case the upper confidence limit (UCL) and the critical concentration) as opposed to the Part 2A scenario (whereby comparison is made between the lower confidence limit (LCL) and the critical concentration).

In instances where the UCL exceeds the given critical value (i.e. SGV/GAC) then the Grubbs test is used to identify upper outliers (same test as the maximum value test described in CLR7) to assess whether the highest value belongs to the general population of the dataset or is representative of an outlier.

2.4.1 Averaging Zones

CLEA methodology requires the definition of averaging zones based on previous / current / future spatial land use, soil type, proposed site end uses or other distinguishing features. Where there is similar historic and/or contemporary land use across the site and the redevelopment plans indicate that the site is to be under a single end-use then horizontally the whole site is taken as one averaging area.

2.4.2 Sample Depths

It is intended that the CLEA statistical analysis is applied to soils from <1.0mbgl. This is due to the greatest likelihood that site end users would be exposed to these soils. Samples tested from below this depth during this assessment have been subjected to a similar analysis to assess the chemical characteristics of natural soils and deeper areas of fill. Where samples are included within the dataset(s) that are >1mbgl, it is assumed, with regards to human health, that excavation associated with the development may result in soils from these greater depths being within 1m of final levels in areas of sensitive end-use at the site. This could be considered as an additional layer of conservatism within the approach adopted.

In addition, it should be noted that the methodology makes depth-based assumptions regarding risks to human health from soils, which can be summarised as follows:-

* For direct ingestion of soil and dust, dermal contact with soil outdoors and soil-derived dust indoors, and inhalation of soil-derived dust outdoors and indoors contamination is assumed to be present in the top 0.5m of the soil profile.
* For consumption of vegetables and ingestion of soil attached to them it is assumed that the contamination is present in the top 0.5m of the soil profile.
* For inhalation of soil vapours outdoors, the contamination is assumed to be at a depth of 1.0m.
* For inhalation of soil vapours indoors, the contamination is assumed to be directly below the building.

© Terragen Environmental Consultants 2011

www.neoviaplan.com

ARUN DISTRICT COUNCIL LU/363/14/PL

Where necessary (and feasible), TGEN take account of the different depths of the potential risks to human health in designing and/or assessing site investigations.

3.0 CONTROLLED WATERS RISK ASSESSMENT

3.1 Control of Residual Contamination

Part 2A of the Environmental Protection Act (1990) introduced the regime for the identification and remediation of contaminated land. Land may be classified as contaminated land under the regime by virtue of actual or likely pollution of controlled waters caused by substances in, on or under the land. The agency is a statutory consultee in relation to controlled waters issues. In situations where there is no existing pollutant linkage, Section 161 of the Water Resources Act (1991) (as amended 2003) and the Anti-Pollution Works Regulations (1999) can be used to address contamination which could represent a potential risk.

3.2 Control of Contamination from Ongoing Activities

The existing Groundwater Directive (80/68/EEC) aims to protect groundwater from pollution by controlling discharges and disposals of certain dangerous substances to groundwater. In the UK, the directive is implemented through the Groundwater Regulations (DETR, 1998b). Groundwater pollution is prevented under these regulations by preventing or limiting the inputs of listed substances into groundwater. Substances controlled under the regulations fall into two lists:

List 1	List 2
* Organohalogen compounds and substances which may form such compounds in the aquatic environment; * Organophosphorus compounds; * Organotin compounds; * Substances which possess carcinogenic, mutagenic or teratogenic properties in or via the aquatic environment (excluding substances which include these properties which is held otherwise be in List 2); * Mercury and its compounds; * Cadmium and its compounds; * Mineral oil and hydrocarbons; and * Cyanides.	* The following metals and metalloids and their compounds: Zinc, Copper, Nickel, Chromium, Lead, Selenium, Arsenic, Antimony, Molybdenum, Titanium, Tin, Barium, Beryllium, Boron, Uranium, Cobalt, Thallium, Tellurium, Silver; * Biocides and their derivatives not appearing in List 1; * Substances which have a deleterious effect on the taste or odour of groundwater and compounds liable to cause the formation of such substances in such water and to render it unfit for human consumption; * Toxic or persistent compounds of silicon and substances which may cause the formation of such compounds in water, excluding those which are biologically harmless or are rapidly converted in water into harmless substances; * Inorganic compounds of phosphorus and elemental phosphorus; * Fluorides; and * Ammonia and nitrites.

Notes
List 1 substances are the most toxic and must be prevented from entering groundwater. Substances in this list may be disposed of to the ground, under a permit, but must not reach groundwater.
List 2 substances are less dangerous, and can be discharged to groundwater under a permit, but must not cause pollution.

Listed dangerous substances have assessment criteria in the form of environmental quality standards (EQS). The dangerous substance is not believed to be detrimental to aquatic life at a concentration below its EQS limit (see EU 2008a).

The existing Groundwater Directive is to be repealed by the Water Framework Directive (WFD) in 2013. DEFRA (2010a) has been used to enact both the WFD and its daughter directive on the protection of groundwater in E&W. This new Groundwater Directive (2006/118/EC) is commonly referred to as the Groundwater Daughter Directive (EU 2006).

© Tetragon Environmental Consultants 2011

www.neviaDI.com

UN DISTRICT COUNCIL LU/363/14/PL

The existing principle of preventing or limiting the inputs of List 1 or List 2 substances respectively into groundwater under the original Groundwater Regulations (DETR 1998b) remains but have been expanded and will continue to expand to encompass any substance liable to cause pollution. In addition, the WFD provides a risk-based framework for regulation.

3.3 Water Framework Directive

The WFD (EU 2000) came into force in England & Wales (E&W) on 02/04/04 through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (SI 2003:3242 dated 10/12/03). The WFD establishes the legal framework to protect and restore clean water across the EU and ensure its long-term, sustainable use. It sets specific deadlines for member states to protect aquatic ecosystems and sets the goal of achieving a good (chemical and ecological) status for all surface water (rivers, estuaries and coastal water) and groundwater (aquifers) in the EU by 2015.

Good status is considered to be a function of concentrations of pollutants which:-

- Do not exceed the quality standards under relevant EU legislation.
- Would not result in a failure of associated surface water bodies to achieve environmental objectives.
- Would not result in a significant diminution of the ecological or chemical quality of associated surface water bodies.
- Would not result in any significant damage to groundwater dependent terrestrial ecosystems.

The WFD is designed to:-

- Enhance the status and prevent further deterioration of aquatic ecosystems and associated wetlands, which depend on the aquatic ecosystems.
- Promote the sustainable use of water.
- Reduce pollution of water, especially by priority and priority hazardous substances.
- Ensure the progressive reduction of groundwater pollution.

The measures to achieve the objectives are set out in River Basin Management Plans (RBMP), of which there are 11 in E&W. The RBMP must be operational by 22/12/12. In E&W, the RBMP were submitted to DEFRA by the agency on 22/12/09 for approval and publication by the deadline. They were enacted by DEFRA (2009).

The WFD requires, as a matter of priority, the causes of pollution to be identified and emissions to be dealt with at source in the most economically and environmentally effective manner. In accordance with Article 4, all member states should implement necessary measures with the aim of progressively reducing pollution from priority substances and ceasing or phasing out emissions, discharges and losses of priority hazardous substances.

The Environmental Quality Standards Directive (2008/105/EC dated 16/12/08) (EQSD) has replaced the List of Priority Substances (2455/2001/EC) since its implementation on 13/01/09. Similarly, the EQSD (EU 2008a) has repealed the limit values contained in a number of specific daughter directives to the old Dangerous Substances Directive (see below) such as those for mercury (82/176/EEC and 84/156/EEC), cadmium (83/513/EEC), HCCH (84/491/EEC) and the List 1 Daughter Directive (86/280/EEC), as amended by 88/347/EEC and 90/415/EEC, although the directives themselves remain in force until fully repealed on 22/12/12. The EQSD is a daughter directive to the WFD and has been enacted in E&W by DEFRA (2010b).

www.neaviaPDF.com

© Terrogen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

The WFD repealed the Drinking Water Abstraction Directive (75/440/EEC dated 16/06/75) (DWAD) on 22/12/07 and will repeal on 22/12/13 the following directives:-

* The Groundwater Directive (2006/118/EC dated 12/12/06) (GWD) repealed 80/68/EEC dated 17/12/79, which was implemented in E&W by The Groundwater Regulations 1998 (SI 1998:2746 dated 02/12/98). The GWD is a daughter directive of the WFD and came into force in the EU on 16/01/09 but will itself be repealed by the WFD. The main aim of the GWD is to protect groundwater against pollution and deterioration. The new GWD has been implemented in E&W by DEFRA (2010a).
* The Shellfish Waters Directive (2006/113/EEC dated 12/12/06) (SWD) is a codified version, which repealed 79/923/EEC dated 30/11/79 and came into force on 16/01/07. The values set by the SWD must be conformed to by 16/01/13, when the WFD repeals the SWD.
* The Fresh Waters Fish Directive (2006/44/EC dated 06/09/06) (FWFD) is a codified version, which repealed 78/659/EEC dated 18/07/78. It was brought into force in E&W by the Surface Waters (Fishlife) (Classification) Regulations 1997 (SI 1997:1331 dated 12/05/97), as amended by SI 2003:1053 on 12/05/03.
* The Dangerous Substances Directive (2006/11/EC dated 15/02/06) (DSD) is a codified version, which repealed 76/464/EEC dated 04/05/76. The DSD has been integrated into the WFD and will be used to implement the EU wide good status of all water bodies by 2015. The current regulations used to implement the DSD into E&W legislation, such as the Surface Waters (Dangerous Substances) (Classification) Regulations 1997 (SI 1997:2560 dated 24/10/97) as amended by SI 1998:389 on 25/03/98, are still in force until repealed by the WFD.

Although the WFD has/will repeal the Directives listed above, and of course all relevant regulations used to introduce the directives into E&W law, the EQS values selected for the WFD must be at least as stringent as those that they replace.

The RBMP must contain measures to implement a number of directives (as listed below), which will remain in force and are not superseded by the WFD:-

* The IPPC Directive (2008/1/EC dated 15/01/08) (IPPCD) is a codified version, which repealed 96/61/EC dated 24/09/96.
* The Bathing Water Directive (2006/7/EEC dated 15/02/06) (BWD), which will repeal 76/160/EEC dated 08/12/75 on 31/12/14.
* The Drinking Water Directive (98/83/EC dated 03/11/98) (DWD) is a codified version, which repealed 80/778/EEC dated 15/07/80. It was brought into force in E&W on 25/12/03 by the Water Supply (Water Quality) Regulations 2000 (SI 2000:3184 made on 04/12/00) and amended by SI 2007:2734 dated 13/09/07, which came into force on 22/12/07.
* The Urban Waste Water Treatment Directive (98/15/EC dated 27/02/98) (UWWTD) amended 91/271/EEC dated 21/05/91 on 27/03/98.
* The Nitrates Directive – an EU wide standard (91/676/EEC dated 12/12/91) (ND).
* The Sewage Sludge Directive (86/278/EEC dated 12/06/86) (SSD).

Similarly, other directives to be taken into account include:-

* The Marine Strategy Framework Directive (2008/56/EC dated 17/06/08) (MSFD) is the equivalent of the WFD for marine waters. The MSFD must be transposed by member states by July 2010 with the aim of achieving good status across the EU by 2020.
* The Biocidal Products Directive (98/8/EC dated 16/02/98) (BPD).
* The Plant Protection Products Directive (91/414/EEC dated 26/07/93) (PPPD).

www.neevia.com

© Terragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

3.4 Assessment Approach

At the GQRA level, assessment typically comprises the following:

* Consideration of soil concentrations of organic substances in the context of soil saturation to determine the potential for migration under gravity.
* Comparison of soil leachate concentrations against appropriate GAC.
* Comparison of groundwater concentrations against appropriate GAC.

This approach is equivalent to Tier 1/Level 1 Assessment as undertaken using ConSim v2.5 (2003) and/or Environment Agency (2006).

The ideal remediation standard from the regulatory perspective is natural background quality, namely, there should be no significant deterioration in the water quality at the receptor (that is, it should not be detectable against natural background variations). This data may be obtained from up hydraulic gradient locations or regional datasets. The agency has published information on the baseline condition of several aquifers. It is recognised, however, that such data is rarely available and remediation to such a standard is often not technically achievable or cost effective. For this reason target concentrations utilised as GAC may be based on water quality standards that are appropriate for the intended use or to ensure that objectives for a groundwater or associated water body are met. The sources of the standards selected are listed in Section 7. In E&W, priority is given to UK standards, then EU standards, with those that are statutory taking precedence over those that are non-statutory. Where data is not available for a specific substance, additional standards such as those published by WHO or USEPA are used if appropriate.

www.neevia.com

© Terragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

4.0 ASSESSMENT OF RISKS FROM GROUND GASES

Where risks from ground gases are identified as a potential SPL then an appropriate programme of gas monitoring and risk assessment is undertaken.

During the site investigation the design of any gas monitoring is based upon the CSM derived as part of the Tier 1 QRA. An appropriate number of boreholes excavated during the site investigation and sited to target the SPL would be installed with standpipes (e.g. 19 to 50mm diameter HDPE monitoring standpipe, protected by an end cap and gravel pack, completed with a bung, valve and metal cover). The response zone (slotted section of pipe) would be confined to the strata identified as the potential pathway for the migration of ground gases. Typically the first one metre from ground level comprises plain standpipe with a bentonite seal to prevent the ingress of atmospheric gases.

In accordance with CIRIA (2007a,b) based on the gas hazard and site sensitivity and appropriate density/spacing for the boreholes would be chosen. Subsequently in accordance with CIRIA (2007a,b) based on the generation potential and site sensitivity for the development an appropriate programme of monitoring over an appropriate period of time would be designed and implemented, ideally during which time at least 2 sets of monitoring would be undertaken during low and/or falling atmospheric pressure.

The results of the gas monitoring assessment are then used to generate a gas screening value (GSV) for the worst case concentration of the gas at the worst case steady state flow (reported in litres per hour), which would then be compared with relevant guidance (see section 6).

* NHBC (2007).
* BSI (2007b).
* CIRIA (2007a,b).

It should be noted that the NHBC traffic light system is specifically for low rise housing developments with a clear, ventilated sub-floor void, whereas CIRIA is for residential (not low rise) developments and/or office/commercial/industrial developments.

Where appropriate the local environmental health department and/or building control are consulted on the scope of any proposed measures to be adopted at the earliest opportunity.

www.neoviaPDF.com

© Terrogen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

5.0 OTHER RISK ASSESSMENT

5.1 Ecological Risk Assessment

Where a statutory ecological receptor is identified on, or in proximity to the site, an assessment in accordance with the current agency Ecological Risk Assessment (ERA) Framework will be undertaken. The framework is currently in development (http://www.environment-agency.gov.uk/research/planning/40375.aspx).

Where soils are to be used for landscape planting, an assessment is made in accordance with BSI (2007a).

5.2 Building Materials Risk Assessment

Where required an assessment of potential risks to typical construction materials is included within the GQRA, with concentrations of contaminants compared against the threshold values given in BRE (2005) for concrete and WRAS (2002) for potable water supply pipes.

www.neeviaPDF.com

© Terrogen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

6.0 REFERENCES & BIBLIOGRAPHY

Alloway (1995). Heavy Metals in Soils (2nd Edition).
BRE (1994). Performance of Building Materials in Contaminated Land (BRE Report 255).
BRE (2001). Protective Measures for Housing on Gas Contaminated Land (BRE Digest 414).
BRE (2004). Cover Systems for Land Regeneration (March 2004).
BRE (2005). Concrete in Aggressive Ground (BRE Special Digest 1, 3rd Edition, 2005).
BRE (2007). Soakaway Design (BRE Digest 365, March 2007).
BSI (1999). Code of Practice for Site Investigations (BS 5930:1999).
BSI (2001). Investigation of Potentially Contaminated Sites Code of Practice (BS 10175:2001).
BSI (2007a). Specification for Topsoil and Recommendations for Use (BS 3882:2007).
BSI (2007b). Code of Practice for the Characterisation and Remediation From Ground Gas in Affected Developments (BS 8485:2007, October 2007).
BSI (2010). Investigation of Potentially Contaminated Sites Code of Practice (BS 10175:2010, Consultation Draft).
CIEH (2009). Generic Assessment Criteria for Human Health Risk Assessment (Land Quality Press, 2nd Edition, 2009).
CIRIA (2001). Contaminated Land Risk Assessment: A Guide to Good Practice (C552, January 2001).
CIRIA (2007a). Assessing Risks Posed by Hazardous Ground Gases to Buildings (Report C658).
CIRIA (2007b). Assessing Risks Posed by Hazardous Ground Gases to Buildings (Report C668).
CIRIA (2009). Unexploded Ordnance (UXO) A Construction Industry Guide (Report C681).
CL:AIRE (2008). Guidance on Comparing Soil Contamination Data with a Critical Concentration (May 2008).
CL:AIRE (2009). Generic Assessment Criteria for Human Health Risk Assessment (December 2009).
CL:AIRE (2010). A Framework for Assessing the Sustainability of Soil and Groundwater Remediation (March 2010).
DEFRA (2007). The Environmental Permitting (England and Wales) Regulations 2007 (SI 2007 3538) (as amended).
DEFRA (2009). River Basin Districts Surface Water and Groundwater Classification (Water Framework Directive) (England and Wales) Direction (December 2009).
DEFRA (2010a). The Environmental Permitting (England and Wales) Regulations 2010 (SI 2010 675) (as amended).
DEFRA (2010b). River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions (August 2010).
DETR (1998a). The Surface Waters (Dangerous Substances) (Classification) Regulations (SI 1998 389).
DETR (1998b). The Groundwater Regulations 1998 (SI 1998 2746).
DETR (2000). The Water Supply (Water Quality) Regulations 2000 (SI 2000 3184) (as amended).
Dickinson et al. (2000). Planting Trees on Contaminated Soils: Issues & Guidelines. (Land Contamination & Reclamation, 8 (2), 2000).
Dobson and Moffat (1993). The Potential for Woodland Establishment on Landfill Sites. HMSO London.
DoE (1991). Landfill Gas. (WMP27, 2nd Edition).
DoE (1994a). Guidance on Preliminary Site Inspection of Contaminated Land (R&D Publication CLR2).
DoE (1994b). The Surface Waters (River Ecosystem) (Classification) Regulations (SI 1994 1057).
DoE (1995a). Industry Profiles (1995).
DoE (1995b). Landfill Design, Construction and Operational Practice (WMP26B).
DoE (1996). The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations (SI 1996 3001).
DoE (1997). The Surface Waters (Fishlife) (Classification) Regulations (SI 1997 1331) (as amended 2003).
ECHA (2011). Introductory Guidance on the CLP Regulations & on the Application of the CLP Criteria.
Eckhardt & Leake (1991). Taken from Land Contamination and Reclamation, 6 (4) (1998).
Environment Agency (2000). Technical Aspects of Site Investigation: Volume 1 (Overview) & Volume 2 (Text Supplements) (R&D Technical Report P5-065/TR).
Environment Agency (2001). Secondary Model Procedures for the Development of Appropriate Soil Sampling Strategies for Land Contamination (R&D Technical Report P5-066/TR).
Environment Agency (2002). Priority Contaminants for the Assessment of Land (R&D Publication CLR8).

© Terragen Environmental Consultants, 2011

www.nevi aPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

Environment Agency (2003). Review of Fate & Transport of Selected Contaminants in the Environment (Report P5-079-TR1).

Environment Agency (2004). Model Procedures for the Management of Land Contamination (R&D Publication CLR11).

Environment Agency (2005). The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soil (Report P5-080/TR3).

Environment Agency (2006). Methodology for the Derivation of Remedial Targets for Soil & Groundwater to Protect Water Resources (R&D Technical Report P20, Version 3.1).

Environment Agency (2007a). How to Find Out if Waste Oil and Wastes That Contain Oil are Hazardous. A Guide to the Hazardous Waste Regulations (HWR06, Version 3.1, June 2007).

Environment Agency (2007b). Information About Your Groundwater Quality Analysis Results (ea/br/ei/std/v1 September 2007).

Environment Agency (2008a). Compilation of Data for Priority Organic Pollutants (Report SC050021/SR7, November 2008).

Environment Agency (2008b). Interpretation of the Definition and Classification of Hazardous Waste (Technical Guidance WM2, 2nd Edition, v2.2 May 2008).

Environment Agency (2009a). Human Health Toxicological Assessment of Contaminants in Soil (Report SC050021/SR2, January 2009).

Environment Agency (2009b). CLEA Software (Version 1.06) and Handbook (Report SC050021/SR4, September 2009).

Environment Agency (2009c). Updated Technical Background to the CLEA Model (Report SC050021/SR3, May 2009).

Environment Agency (2009d). A Review of Body Weight and Height Data Used in the CLEA Model (Report SC050021/Final Technical Review 1, January 2009).

Environment Agency (2009e). Using Soil Guidance Values (SC050021/SGV Introduction, March 2009).

Environment Agency (2009f). Getting the Basics Right - How to Comply With Your Environmental Permit (V23, June 2009).

Environment Agency (2009g). Standards and Measures for the Disposal of Inert Waste on Land (June 2009).

Environment Agency (2010a). H1 Environmental Risk Assessment for Permits (Consultation Draft, Version 2.0, April 2010).

Environment Agency (2010b). Guiding Principles for Land Contamination (GPLC1, March 2010).

Environment Agency (2010c). FAQs, Technical Information, Detailed Advice and References (GPLC2, March 2010).

Environment Agency (2010d). Reporting Checklists (GPLC3, March 2010).

EU (1998). The Quality of Water Intended for Human Consumption, Council Directive (98/83/EC).

EU (2000). The Water Framework Directive (2000/60/EC).

EU (2006). The Groundwater Directive (2006/118/EC).

EU (2008a). The Environmental Quality Standards Directive (2008/105/EC).

EU (2008b). The Waste Framework Directive (2008/98/EC).

EU (2009). Classification, Labelling & Packaging of Substances & Mixtures (1272/2008/EC).

HSE (1991). Protection of Workers & the General Public During the Development of Contaminated Land.

HSE (2005). Approved Supply List (6th Edition, September 2005).

HSE (2007). EH40/2005 Occupational Exposure Limits 2005 (as amended October 2007).

HSE (2009). The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 716).

HSE (2010). Asbestos: The Survey Guide (HSG 264, February 2010).

ICRCL (1990). Notes on the Restoration and Aftercare of Metalliferous Mining Sites for Pasture and Grazing (Guidance Note 70/90).

MADEP (20[illegible]). Characterising Risks Posed by Petroleum Contaminated Sites.

MAFF (1998). The Soil Code.

NEPC (1999). Guidelines on Investigation Levels for Soil and Groundwater. (Schedule B1).

NHBC (20[illegible]). Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present (RSK, March 2007).

NHBC (2008). Guidance for the Safe Development of Housing on Land Affected by Contamination (R&D Publication 66, Volume 1).

NIPHE (2001). Technical Evaluation of the Intervention Values for Soil, Sediment and Groundwater (RIVM Report 711701 023).

RCEH (1993). Lead in Soil: Recommended Guidelines.

SNIFFER (2003). Method for Deriving Site Specific Human Health Assessment Criteria for Contaminants in Soil (LQM,

© Terragen Environmental Consultancy 2011

www.mydocpdf.com

ARUN DISTRICT COUNCIL LU/363/14/PL

April 2003).

USEPA (1996). Soil Screening Guidance: Technical Background Document (EPA/540/R95/128).

USEPA (2005) Partition Coefficients for Metals in Surface Water, Soil and Waste, EPA/600/R-05/074.

World Health Organisation (WHO) (1984) Guidelines for Drinking Water Quality.

World Health Organisation (WHO) (2005) Petroleum Products in Drinking-water, Background document for development of WHO Guidelines for Drinking-water Quality, WHO (WHO/SDE/WSH/05.08/123).

WRAS (2002). The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land (IGN 9-04-03, issue 1, October 2002).

www.neeviaPDF.com

© Terragen Environmental Consultants 2011

ARUN DISTRICT COUNCIL LU/363/14/PL

Appendix 8 GroundSure Report.

www.neeviaPDF.com

© Terragen Environmental Consultants 2011

GroundSure Data

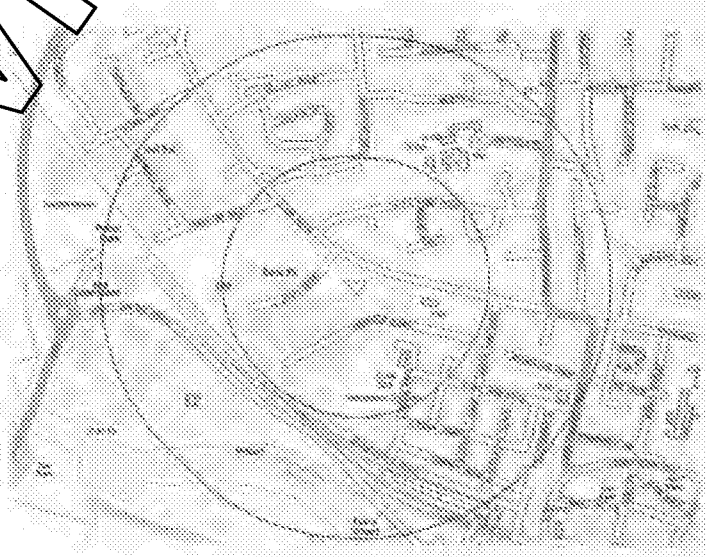
Address: Fort Road Garage,Fort Road East,Littlehampton,BN17 7QZ

Date: May 20, 2011

GroundSure Reference: S EMS-128096_175802

Your Reference: EMS_128096_175802

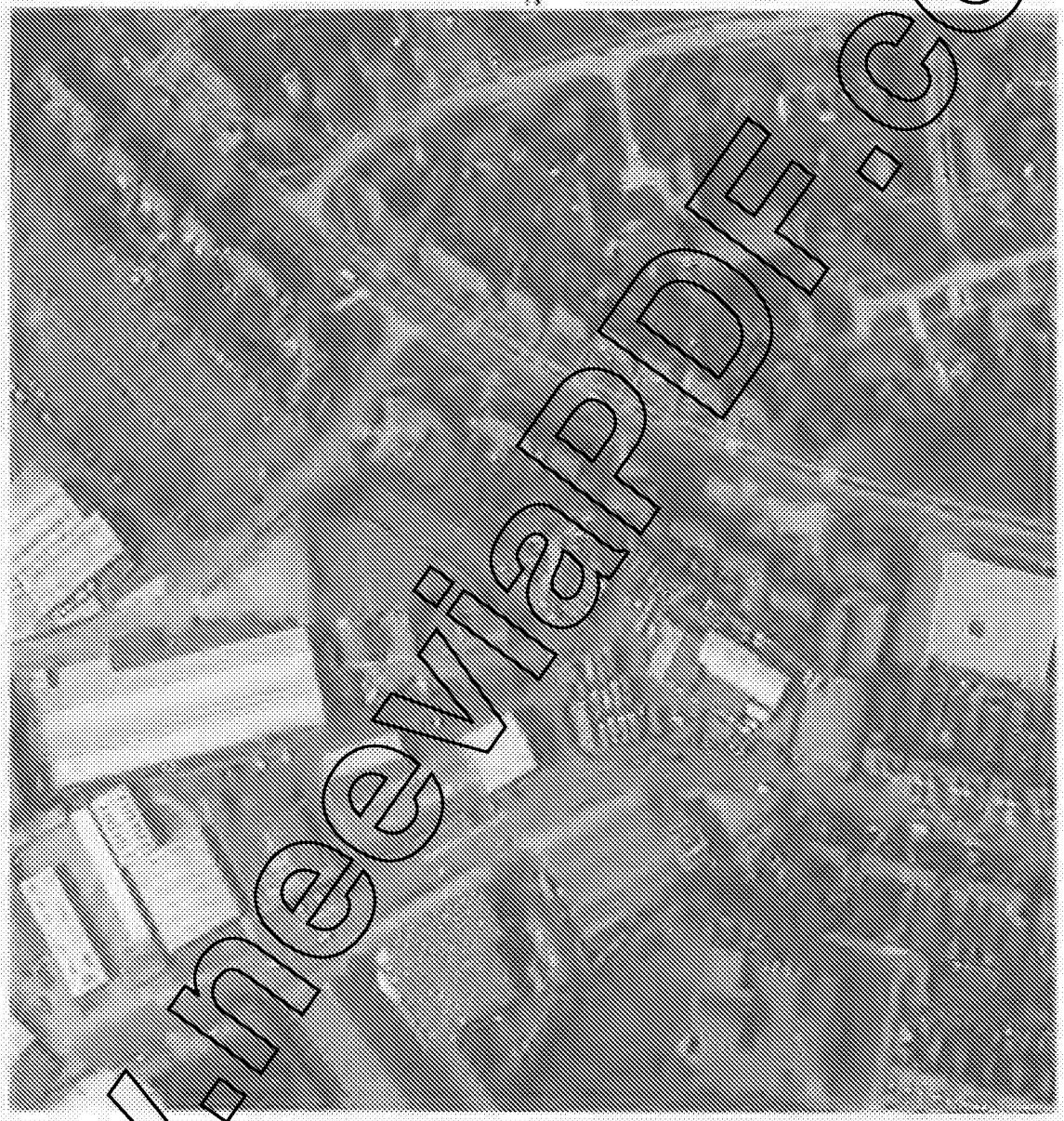
Client: EmapSite



www.neeviaPDF.com

Aerial Photograph of Study Site

NW N NE



W E

SW S SE

Aerial Photography supplied by Getmapping PLC.
© Getmapping PLC 2003. All rights Reserved.

Site Name: Fort Road Garage,Fort Road East,Littlehampton,BN17 7QZ
Grid Reference: 502253,102655

www.landmapper.com

ARUN DISTRICT COUNCIL LU/363/14/PL

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) of the study site boundary					
1. Historical Industrial Sites	on-site	0-30	31-250	251-500	501-1000	1000-1500
1.1 Potentially Contaminative Past Land Use						
Records of potentially contaminative past land use (1:10,000 scale mapping)	3	3	6*	-	-	-
1.2 Additional Information – Historical Tanks (1:2,500,1:1,250 scale mapping)	0	0	0*	-	-	-
1.3 Additional Information – Historical Energy Features (1:2,500,1:1,250 scale mapping)	0	3	3*	-	-	-
1.4 Additional Information – Historical Petrol and Fuel Site Database (1:2,500,1:1,250 scale mapping)	0	0	0*	-	-	-
1.5 Additional Information – Historical Vehicle Repair and Garages (1:2,500,1:1,250 scale mapping)	0	0	0*	-	-	-
1.6 Potentially Infilled Land						
Records of potentially infilled land (1:10,000 scale mapping)	1	0	0*	-	-	-
*51-100m						

2. Environmental Permits, Incidents and Registers	on-site	0-30	31-250	251-500	501-1000	1000-1500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
Records of historic IPC authorisations	0	0	0	0	-	-
Records of Part A(1) and IPPC Authorised Sites	0	0	0	0	-	-
Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0	-	-
Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0	-	-
Records of List 1 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of Part A(2) and Part B Activities and Enforcements	0	0	0	5	-	-
Records of Category 1 or 2 Radioactive Substances Authorisations	0	0	1	1	-	-
Records of Licensed Discharge Consents	0	0	0	15	-	-
Records of Pollutant Hazardous Substance Consents and Enforcements	0	0	2	0		
2.2 Records of COMAH and NIHHS sites	0	0	1	0	-	-
2.3 Environmental Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	0	1	0	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
2.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

3. Landfill and Other Waste Sites

	on-site	0-50	51-250	251-500	501-1000	1001-1500
3.1 Landfill Sites						
Environment Agency Registered landfill Sites	0	0	0	0	0	-
Landfill Data - Operational Landfill Sites	0	0	0	0	0	-
Environment Agency Historic Landfill Sites	0	0	0	1	0	1
Landfill Data - Non-Operational Landfill Sites	0	0	0	0	0	-
BGS/DoE Landfill Site Survey	0	0	0	0	1	0
GroundSure Local Authority Landfill Sites Data	0	0	0	1	3	0
3.2 Landfill and Other Waste Sites Findings						
Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	1	-	-
Environment Agency licensed Waste Sites	0	0	-	1	0	0

4. Current Land Uses

	on-site	0-50	51-250	251-500	501-1000	1001-1500
4.1 Current Industrial Sites Data	0	5	51	-	-	-
4.2 Records of Petrol and Fuel Sites	0	0	0	0	-	-
4.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0	-	-

5. Geology

	Discretion
5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? *	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site? *	Yes
5.3 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
Source: Scale: 1:50,000 BGS Sheet 318	

* This includes an automatically generated 500m buffer zone around the site.

6. Hydrogeology and Hydrology

	on-site	0-50	51-250	251-500	501-1000	1001-2000
6.1 Are there any records of Permeable Strata in the Superficial Geology within 500m of the study site?				Yes		
6.2 Are there any records of Productive Strata in the Bedrock Geology within 500m of the study site?				Yes		
6.3 Groundwater Abstraction Licences within 1000m of the study site).	0	0	0	1	0	-
6.4 Surface Water Abstraction Licences (within 1000m of the study site).	0	0	0	0	2	-
6.5 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	0
6.6 Are there any Source Protection Zones within 500m of the study site?					No	

6.7 River Quality	on-site	0-50	51-250	251-500	501-1000	1001-1500
Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	No
Detailed River Network entries within 500m of the site	0	0	0	0	-	-
Surface Water Features within 250m of the study site	No	No	No	-	-	-

7. Flooding

www.neoviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

7.1 Are there any Environment Agency Indicative Zone 2 floodplains within 250m of the study site?	Yes
7.2 Are there any Environment Agency Indicative Zone 3 floodplains within 250m of the study site?	No
7.3 Are there any Flood Defences within 250m of the study site?	No
7.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.5 Are there any areas used for Flood Storage within 250m of the study site?	No
7.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Very High
7.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	High

8. Designated Environmentally Sensitive Sites

	on-site	0-50	51-250	251-500	501-1000	1001-1500
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	-	-
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	-	-
8.3 Records of Local Nature Reserves (LNR)	0	0	0	0	-	-
8.4 Records of Special Areas of Conservation (SAC)	0	0	0	0	-	-
8.5 Records of Special Protection Areas (SPA)	0	0	0	0	-	-
8.6 Records of Ramsar sites	0	0	0	0	-	-
8.7 Records of World Heritage Sites	0	0	0	0	-	-
8.8 Records of Environmentally Sensitive Areas	0	0	0	0	-	-
8.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	-	-
8.10 Records of National Parks	0	0	0	0	-	-
8.11 Records of Nitrate Sensitive Areas	0	0	0	0	-	-

9. Additional Information

	on-site	0-50	51-250
9.1 Records of mobile phone transmitters	0	0	0
9.2 Records of potential sites of 0f0m telecommunications masts	0	0	0

9.3 Have any overhead transmission lines been identified in proximity to the study site in this search?	No

10. Natural Hazards

10.1 What is the maximum risk of natural ground subsidence?	Very Low
10.2 Is the property in a radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level
Is the property in an area where radon protection measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

11. Mining

11.1 Are there any coal mining areas within 75m of the study site?	No
11.2 What is the risk of subsidence relating to shallow mining within 150m of the study site?	Low
11.3 Are there any brine affected areas within 75m of the study site?	No

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

Using this Report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 250m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure underground oil and gas pipelines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on groundwater vulnerability, soil leaching potential, abstraction licenses, Source Protection Zones (SPZ) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on surface water flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas and Special Heritage Sites. These searches are conducted using radii of up to 500m.

9. Additional Information

Provides information on records of mobile phone transmitters, potential sites of OfCom telecommunication masts and overhead transmission lines up to 500m.

www.neaviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

10. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon.

11. Mining

Provides information on areas of coal and shallow mining.

12. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, GroundSure provide a free Technical Helpline (08444 159000) for further information and guidance.

Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the search site boundary.

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

1.Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from High Detail (1:10,000 scale) Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 250m of the search boundary: 33

The following records are not represented on Mapping:

Distance (m)	Direction	Use	Date
0.0	On Site	Depot and Destructor Works	1932
0.0	On Site	Depot and Destructor Works	1938
0.0	On Site	Unspecified Works	1957
3.0	SW	Unspecified Works	1992
3.0	SW	Unspecified Works	1981
3.0	SW	Unspecified Works	1974
70.0	S	Unspecified Works	1974
89.0	W	Unspecified Works	1992
89.0	W	Unspecified Works	1981
89.0	W	Unspecified Works	1974
89.0	W	Unspecified Works	1957
97.0	SE	Unspecified Works	1957
139.0	SW	Unspecified Commercial/Industrial	1992
142.0	SE	Ambulance Station	1992
144.0	SW	Unspecified Commercial/Industrial	1938
144.0	SW	Sewage Works	1910
153.0	SW	Gas Works	1896
167.0	SW	Gasometers	1910
167.0	SW	Unspecified Tanks	1974
167.0	SW	Gasometers	1896
167.0	SW	Unspecified Tank	1932
196.0	S	Gasometer	1974
196.0	SW	Unspecified Tank	1932
198.0	SW	Unspecified Tank	1992
198.0	SW	Unspecified Tank	1981
198.0	SW	Gasometer	1974
201.0	S	Gasometer	1910
201.0	S	Unspecified Tank	1938
202.0	S	Unspecified Tank	1932
230.0	S	Unspecified Works	1974
230.0	S	Unspecified Works	1981
230.0	S	Unspecified Works	1992
247.0	SW	Railway Sidings	1910

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 100m of the search boundary: 0

Database searched and no data found.

www.neevia.PDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

1.3 Additional Information - Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 100m of the search boundary: 6

The following records are not represented on Mapping:

Distance (m)	Direction	Use	Date
23.0	S	Electricity Sub Station	1967
23.0	SE	Electricity Sub Station	1984
23.0	SE	Electricity Sub Station	1993
82.0	W	Electricity Sub Station	1984
82.0	W	Electricity Sub Station	1993
83.0	W	Electricity Sub Station	1967

1.4 Additional Information - Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 100m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information - Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 100m of the search boundary: 0

Database searched and no data found.

1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 100m of the study site: 1

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

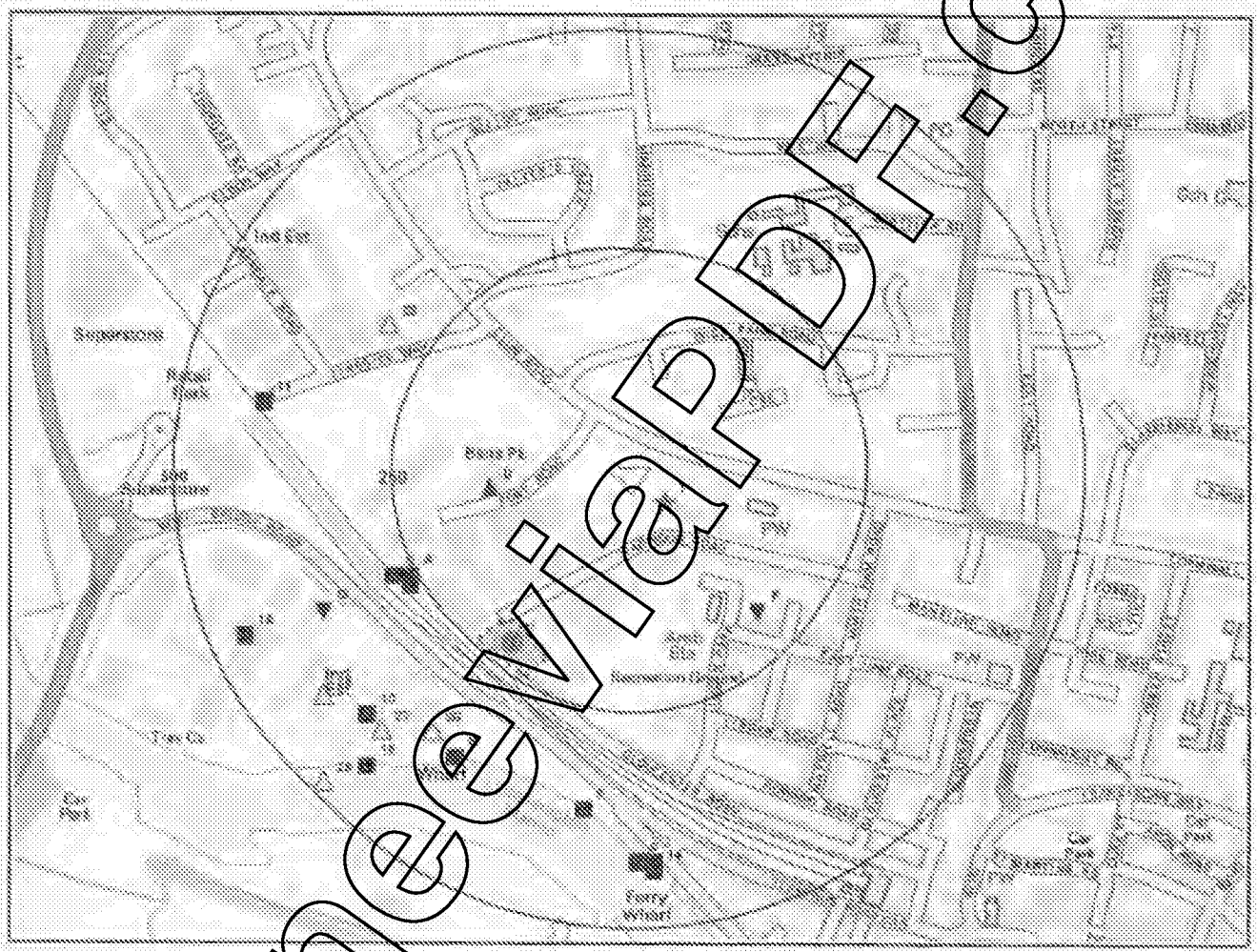
Distance (m)	Direction	Use	Date

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

www.neeviaPDF.com

2. Environmental Permits, Incidents and Registers Map



Authorisations, Incidents and Registers Legend

Ordnance Survey
Crown Copyright. All rights Reserved
Licence Number: 100035207

- Site Outline
- Search Buffers (m)
- Recorded Pollution Incident
- Dangerous Substances (List 1)
- Dangerous Substances (List 2)
- Water Industry Referrals
- Licensed Discharge Consents
- Red List Discharge Consents
- RAS 3 & 4 Authorisations
- Part A(1) Authorised Processes and Historic IPC Authorisations
- Part A(2) and Part B Authorised Processes
- COMAH / NIHHS Sites
- Sites Determined as Contaminated Land
- Hazardous Substance Consents and Enforcements

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

2.Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and local authorities reveal the following information:

Records of historic IPC Authorisations within 500m of the study site: 0

Database searched and no data found.

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: 8

The following Part A(1) and IPPC Authorised Activities are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance (m)	Direction	NGR	Details
350	139.0	W	SQ2090, 102640	Operator: Ethos Recycling Ltd Installation Name: Ethos Recycling Ltd Process: ASSOCIATED PROCESS Permit Number: GP3631GH Original Permit Number: GP3631GH EPR Reference: EA/EPR/GP3631GH/T001 Issue Date: 6/4/2009 Effective Date: 6/4/2009 Last date noted as effective: 2010-02-08 Status: Superceded
350	139.0	W	SQ2090, 102640	Operator: Ethos Recycling Ltd Installation Name: Ethos Recycling Ltd Process: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE Permit Number: GP3631GH Original Permit Number: GP3631GH EPR Reference: EA/EPR/GP3631GH/T001 Issue Date: 6/4/2009 Effective Date: 6/4/2009 Last date noted as effective: 2010-02-08 Status: Superceded
370	139.0	W	SQ2090, 102640	Operator: Medisort Ltd Installation Name: Littlehampton Waste Treatment Plant Process: ASSOCIATED PROCESS Permit Number: GP3536TW Original Permit Number: GP3536TW EPR Reference: - Issue Date: 1/7/2010 Effective Date: 1/7/2010 Last date noted as effective: 2010-02-08 Status: Transfer Effective
380	139.0	W	SQ2090, 102640	Operator: Medisort Ltd Installation Name: Littlehampton Waste Treatment Plant Process: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE Permit Number: GP3536TW Original Permit Number: GP3536TW EPR Reference: - Issue Date: 1/7/2010 Effective Date: 1/7/2010 Last date noted as effective: 2010-02-08 Status: Transfer Effective
390	139.0	W	SQ2090, 102640	Operator: Cliniserve Ltd Installation Name: Cliniserve Ltd Waste Treatment Plant Process: ASSOCIATED PROCESS Permit Number: TP3235XV Original Permit Number: TP3235XV EPR Reference: - Issue Date: 19/12/2008 Effective Date: 19/12/2008 Last date noted as effective: 2010-02-08 Status: Superceded

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

40D	139.0	W	502890, 102940	Operator: Cleanserve Ltd Installation Name: Cleanserve Ltd Waste Treatment Plant Process: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE	Permit Number: [illegible] Original Permit Number: [illegible] EPR Reference: - Issue Date: 19/12/2008 Effective Date: 19/12/2008 Last date noted as effective: 2010-02-08 Status: Superseded
41D	139.0	W	502890, 102940	Operator: Ethos Medical & Special Waste Ltd Installation Name: Ethos Recycling Ltd Process: ASSOCIATED PROCESS	Permit Number: WP3233TF Original Permit Number: WP3233TF EPR Reference: - Issue Date: 5/3/2010 Effective Date: 5/3/2010 Last date noted as effective: 2010-02-08 Status: Superseded
42D	139.0	W	502890, 102940	Operator: Ethos Medical & Special Waste Ltd Installation Name: Ethos Recycling Ltd Process: WASTE LANDFILLING; >10 T/D WITH CAPACITY >25,000T EXCLUDING INERT WASTE	Permit Number: WP3233TF Original Permit Number: WP3233TF EPR Reference: - Issue Date: 5/3/2010 Effective Date: 5/3/2010 Last date noted as effective: 2010-02-08 Status: Superseded

Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 0

Database searched and no data found.

Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 0

Database searched and no data found.

Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: 5

The following Part A(2) and Part B Activities are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance [m]	Direction	NGR	Details
37	[illegible]	NW	501974, 102829	Address: Fine Cast Foundry Ltd, Unit 1, Lineside Way,Rotherham,Sm17 9ej Process: Foundry Status: Current Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.
38	358.0	SW	503025, 102359	Address: Arc(southern)ltd, Storage Land Etc,quayside,sm17 5dn Process: Not Given Status: Revoked Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.

www.neeviaPDF.com

27	397.0	SW	501965, 102360	Address: Redland Aggregates Ltd., Asphalt Plant Offices, Quayside,bn17 5dh Process: Not Given Status: Current	Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.
28	419.0	SW	501950, 102400	Address: Lafarge Redland Quayside, Bn17 5dd Process: Roadstone Process Status: Unknown	Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.
29	487.0	SW	501900, 102300	Address: Hanson(prev Arc) Quayside, Bn17 5dd Process: Concrete & Crushing Process Status: Unknown	Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: 2

The following RAS Licence (3 or 4) records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance (m)	Direction	Address	Operator	Type	Permission Number	Dates	Status
4.3	197.0	SE	C.m. Wood Body Repair Centre, Lindel Park, Littlehampton, West Sussex, BN1	C.m. Wood Body Repair Centre	Keeping And Use Of Radioactive Materials (was Res60 Section 1).	AS1878	Date of Approval:- Effective from:- Last date of update:2001-05-01	-
4.4	365.0	SW	R.w Masters Coachworks, Unit 4 riverside Industrial Estate, Toll Road, Littlehampton, West Sussex, BN17 5DF	R.w Masters Coachworks	Keeping And Use Of Radioactive Materials (was Res60 Section 1).	AS1924	Date of Approval:- Effective from:- Last date of update:2001-05-01	-

Records of Licensed Discharge Consents within 500m of the study site: 15

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance (m)	Direction	NGR	Details
2A	258.0	SW	502000, 102540	Address: Water Lane Littlehampton Wps, Water Lane Wps, Water Lane, Littlehampton, West Sussex, BN17 7DH Effluent Type: Sewage Discharges - Pumping Station - Water Company Permit Number: AE1262 Permit Version: 2	Receiving Water: Ditch To River Arun Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 21/9/2007 Effective Date: 1/4/2008 Revocation Date: -
3A	258.0	SW	502000, 102540	Address: Water Lane Littlehampton Wps, Water Lane Wps, Water Lane, Littlehampton, West Sussex, BN17 7DH Effluent Type: Sewage Discharges - Pumping Station - Water Company Permit Number: AE1262 Permit Version: 1	Receiving Water: Ditch To River Arun Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 21/9/2007 Effective Date: 21/9/2007 Revocation Date: 31/3/2009
4A	262.0	SW	502000, 102530	Address: Water Lane/arundel Road, Water Lane/arundel Road, Littlehampton, West Sussex Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: AE0862 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 23/7/2001 Effective Date: 23/7/2001 Revocation Date: 30/8/2001

www.neviaPDF.com

5A	382.0	SW	SO2080, 102530	Address: Water Lane/arundel Road, Water Lane/arundel Road, Littlehampton, West Sussex Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: AB0863 Permit Version: 2	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 30/7/2001 Effective Date: 28/7/2001 Revocation Date: -
6	278.0	SW	SO1980, 102540	Address: Ditch West Boundary @ Railway, Ditch West Boundary @ Railway, Harwood Industrial Est, Littlehampton, West Sussex Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: SO1430 Permit Version: 1	Receiving Water: Controlled Sea Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: - Effective Date: - Revocation Date: 30/9/1997
7B	386.0	SW	SO2050, 102330	Address: Arc Premix, Littlehampton Plant, Arc Premix, Littlehampton Plant, Quayside, Littlehampton, West Sussex Effluent Type: Trade Discharges - Site Drainage Permit Number: PB3770 Permit Version: 1	Receiving Water: Saline Estuary Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 31/3/1993 Effective Date: 31/3/1993 Revocation Date: -
8B	366.0	SW	SO2050, 102320	Address: Arc Premix, Littlehampton Plant, Arc Premix, Littlehampton Plant, Quayside, Littlehampton, West Sussex Effluent Type: Trade Discharges - Site Drainage Permit Number: PB3770 Permit Version: 1	Receiving Water: Saline Estuary Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 31/3/1993 Effective Date: 31/3/1993 Revocation Date: -
9	367.0	S	SO3200, 102270	Address: Old Customs House, Wharf Road, Old Customs House, Wharf Road, Littlehampton Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: NB1368 Permit Version: 1	Receiving Water: Freshwater River Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 9/5/1967 Effective Date: 9/5/1967 Revocation Date: 31/3/1997
10	355.0	SW	SO1950, 102360	Address: Littlehampton Wharf, Littlehampton Wharf, River Arun, Littlehampton, West Sussex Effluent Type: Trade Discharges - Process Consent - Not Water Company Permit Number: NB1456 Permit Version: 1	Receiving Water: Saline Estuary Status: Revoked (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 5/3/1984 Effective Date: 5/3/1984 Revocation Date: 15/5/2008
11	406.0	W	SO1830, 102760	Address: Lineside Industrial Estate, Lineside Industrial Estate, Fort Road, Littlehampton, West Sussex Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: SO2085 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 10/6/1971 Effective Date: 10/6/1971 Revocation Date: 11/5/1995
12C	423.0	S	SO2280, 102300	Address: The Arun View Inn, The Arun View Inn, Wharf Road, Littlehampton West Sussex Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: SO1453 Permit Version: 1	Receiving Water: Controlled Sea Status: Lapsed Under Schedule 23 Environment Act 1995 Issue date: 12/4/1966 Effective Date: 12/4/1966 Revocation Date: 31/3/1997
13C	434.0	S	SO2280, 102310	Address: Maxwell Rd/east Ham Rd, Maxwell Rd/east Ham Rd, Littlehampton, Sussex Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: AB0866 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 13/7/2001 Effective Date: 13/7/2001 Revocation Date: -
14	434.0	S	SO2280, 102200	Address: Talbot Road Littlehampton Cso, Talbot Road Littlehampton Cso, Talbot Road, Littlehampton, West Sussex, BN17 7BP Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: AB1361 Permit Version: 1	Receiving Water: River Arun (tidal) Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 7/2/2008 Effective Date: 7/2/2008 Revocation Date: -
15	437.0	SW	SO1950, 102320	Address: The Quayside, The Quayside, Littlehampton, West Sussex Effluent Type: Miscellaneous Discharges - Surface Water Permit Number: NB2812 Permit Version: 1	Receiving Water: Freshwater River Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: 26/6/1975 Effective Date: 26/6/1975 Revocation Date: 1/7/1981

www.neeviaPDF.com

16	459.0	SW	501810, 102470	Address: River Side Works, Littlehampton, River Side Works, Littlehampton Effluent Type: Unspecified Permit Number: SO3642 Permit Version: 1	Receiving Water: Pa[illegible] Status: Pre Nra Legislation Consent Issue Date < 01/04/1996 Effective Date: [illegible] Issue Date: 30/11/1973 Effective Date: 30/11/1973 Revocation Date: 01/04/1996

Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: 2

The following records are represented as polygons on the Industrial Sites and Processes map:

ID	Distance [m]	Direction	Application Reference Number	Application Status	Application Date	Address	Details	Details of Enforcement
45H	318.0	SW	LU/381/93/HS	Approved	No details	Littlehampton Gasholder Station, Gloucester Road, Littlehampton	Application under the Hazardous Substance Act 1992 for the continuance of use of existing gasholder.	Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.
46H	318.0	SW	LU/49/91/HS	Approved	No details	Littlehampton Gasholder Station, Gloucester Road, Littlehampton	Application under the Hazardous Substance Act 1992 for the continued storage of liquified petroleum gas.	Enforcement: Data requested, not received. Date of Enforcement: Data requested, not received. Comment: Data requested, not received.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 1

The following COMAH & NIHHS Authorisation records provided by the Health and Safety Executive are represented as polygons or buffered points on the Authorisations, Incidents and Registers map:

ID	Distance [m]	Direction	NGR	Address	Type	Update
32 E	197.0	SW	502100, 102400	british gas,gloucester road,little hampton,bn17 7ab	NIHHS	2001

2.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: 1

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance [m]	Direction	NGR	Details
1	35.0	SE	502392, 102623	Incident Date: 16/2/2002 Incident Identification: 60543 Pollutant: Atmospheric Pollutants and Effects Pollutant Description: Effects on Humans Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

www.neaviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

Records of National Incidents Recording System, List 1 within 250m of the study site: 0

Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part IIA EPA 1990[1]

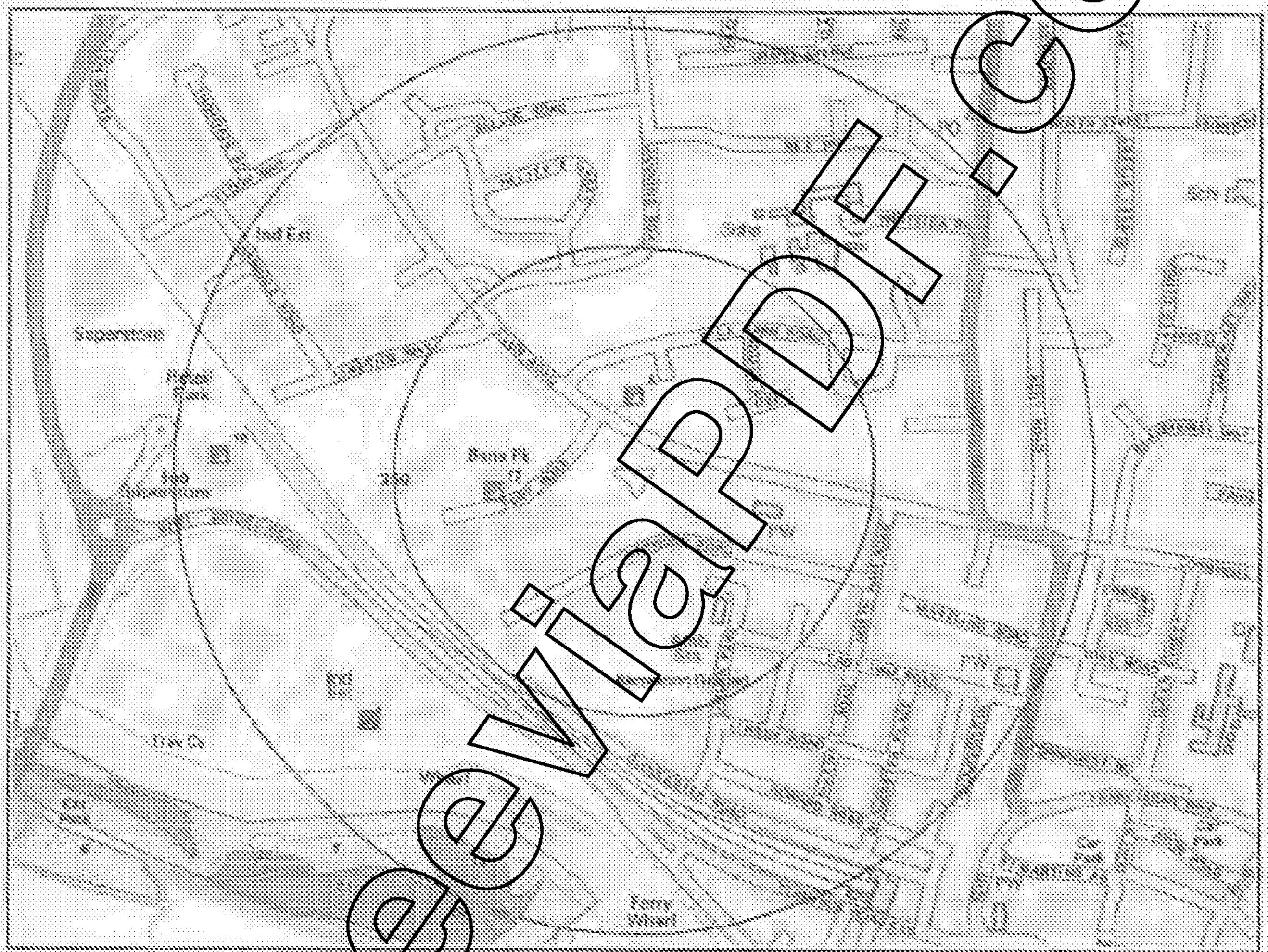
How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

[1] Further information on sites that have been determined under the Contaminated Land Regime is maintained by Local Authorities under Section 78R of the Environmental Protection Act 1990. Information should be available on both sites currently determined as Contaminated Land and Special Sites.

www.neeviaPDF.com

3. Landfill and Other Waste Sites Map



Landfill & Other Waste Sites Legend

Ordnance Survey
Crown Copyright. All Rights Reserved
Licence Number: [illegible]

- Site Outline
- Search Buffers (m)
- E.A. Active Landfill
- E.A. Historic Landfill (Area Data)
- E.A. Historic Landfill (Point Data)
- BGS / DoE Survey Landfill
- Local Authority Landfill (Area Data)
- Local Authority Landfill (Point Data)
- Operational Waste Treatment Licence
- Closed Waste Treatment Licence
- REGIS Waste Licence
- Operational Landfill
- Closed Landfill

Report Reference: S EMS-128096_175802

www.neviaPDF.com

3. Landfill and Other Waste Sites

3.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site: 0

Database searched and no data found.

Records of operational landfill sites sourced from Landmark within 1000m of the study site: 0

Database searched and no data found.

Records of Environment Agency historic landfill sites within 1500m of the study site: 9

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	NGR	Details	
5	407.0	S	501900, 103200	Site Address: Littlehampton Ferry Road South, Littlehampton, Sussex Waste Licence: - Site Reference: WD27/148b Waste Type: Inert, Commercial, Household Regis Reference: -	Licence Issue: - Licence Surrendered: - Licence Hold Address: - Operator: -
6	694.0	SW	501800, 102900	Site Address: Littlehampton Marina Extension, Littlehampton, Sussex Waste Licence: Yes Site Reference: WD27/148, WD13/47 Waste Type: , Industrial Regis Reference: -	Licence Issue: 30/03/1981 Licence Surrendered: 07/01/1983 Licence Hold Address: - Operator: -
7	736.0	SW	501900, 102800	Site Address: Ferry Road North, Littlehampton, Sussex Waste Licence: Yes Site Reference: WD27/48a, WD27/148a Waste Type: Inert, Industrial, Commercial, Household Regis Reference: -	Licence Issue: 01/01/1976 Licence Surrendered: - Licence Hold Address: - Operator: Littlehampton Urban District Council
Not shown	773.0	SW	501500, 103000	Site Address: Wick Farm, Littlehampton, Sussex Waste Licence: - Site Reference: WD27/152 Waste Type: - Regis Reference: -	Licence Issue: - Licence Surrendered: - Licence Hold Address: - Operator: -
Not shown	1133.0	SW	501200, 103000	Site Address: Climping, Climping, Sussex Waste Licence: Yes Site Reference: WD27/064, WD13/5/19 Waste Type: Inert Regis Reference: -	Licence Issue: 22/05/1978 Licence Surrendered: 18/11/1978 Licence Hold Address: - Operator: -
Not shown	1166.0	NE	501300, 103200	Site Address: Cornfield Close Caravan Site, Worthing Road, Littlehampton, Sussex Waste Licence: Yes Site Reference: WD27/153 Waste Type: Inert, Commercial, Household Regis Reference: -	Licence Issue: 01/01/1976 Licence Surrendered: - Licence Hold Address: - Operator: -
Not shown	1284.0	N	501700, 103900	Site Address: Brook Barn Farm, Littlehampton, Sussex Waste Licence: Yes Site Reference: WD27/218 Waste Type: Inert, Industrial Regis Reference: -	Licence Issue: 01/01/1976 Licence Surrendered: - Licence Hold Address: - Operator: -

www.neevia.PDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

Not shown	1423.0	W	500600, 102800	Site Address: Ford Prison, Climping, Sussex Waste Licence: Yes Site Reference: WD13/5/8, WD27/114 Waste Type: Inert, Industrial Regis Reference: -	Licence Issue: 01/01/1976 Licence Surrender: - Licence Hold Address: - Operator: -
Not shown	1498.0	N	501500, 104290	Site Address: Old Mead Road Tip, Littlehampton, Sussex Waste Licence: Yes Site Reference: 27-329, WD27/151, WD13/12, WD13/79 Waste Type: Inert, Industrial, Commercial, Household, Special, Liquid Sludge Regis Reference: -	Licence Issue: 13/05/1977 Licence Surrender: 13/10/1984 Licence Hold Address: - Operator: -

Records of non-operational landfill sites sourced from Landmark within 2000m of the study site: 0

Database searched and no data found.

Records of BGS/DoE non-operational landfill sites within 1500m of the study site: 1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	NGR	Details
Not shown	861.0	SW	501500, 102300	Site Address: Wick, Littlehampton, West Sussex BGS Number: 23.0 Risk: Risk not recorded Waste Type: N/A

Records of Local Authority landfill sites within 1500m of the study site: 5

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	Site Address	Source	Data Type
19	436.0	SW	Refuse Tip	1967 mapping	Polygon
20	505.0	S	Refuse Tip	1967 mapping	Polygon
21	567.0	SW	Refuse Tip	1969 mapping	Polygon
22	582.0	SW	Refuse Tip	1969 mapping	Polygon
23	622.0	SW	Refuse Tip	1969 mapping	Polygon

3.2 Other Waste Sites

Records of operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Database searched and no data found.

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: 1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	NGR	Details

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

4	358.0	SW	501950, 103375	Site Address: Quayside, Bridge Road, LITTLEHAMPTON, West Sussex, Landfill Licence: 448AEHAL, EA Reference: -, Waste Type: Difficult, Waste Description: Difficult, Known Restrictions: No known restriction on source of waste	Record Date: [illegible] 987, Transfer Date: -, Modification Date: [illegible] 2[illegible]1[illegible]8, Status: Licence lapsed/cancelled/otherwise not applicable/surrendered, Category: [illegible]/[illegible], Regulator: [illegible] Southern Region - Sussex Area (West), Site: Undefined

Records of Environment Agency licensed waste sites within 1500m of the study site: S

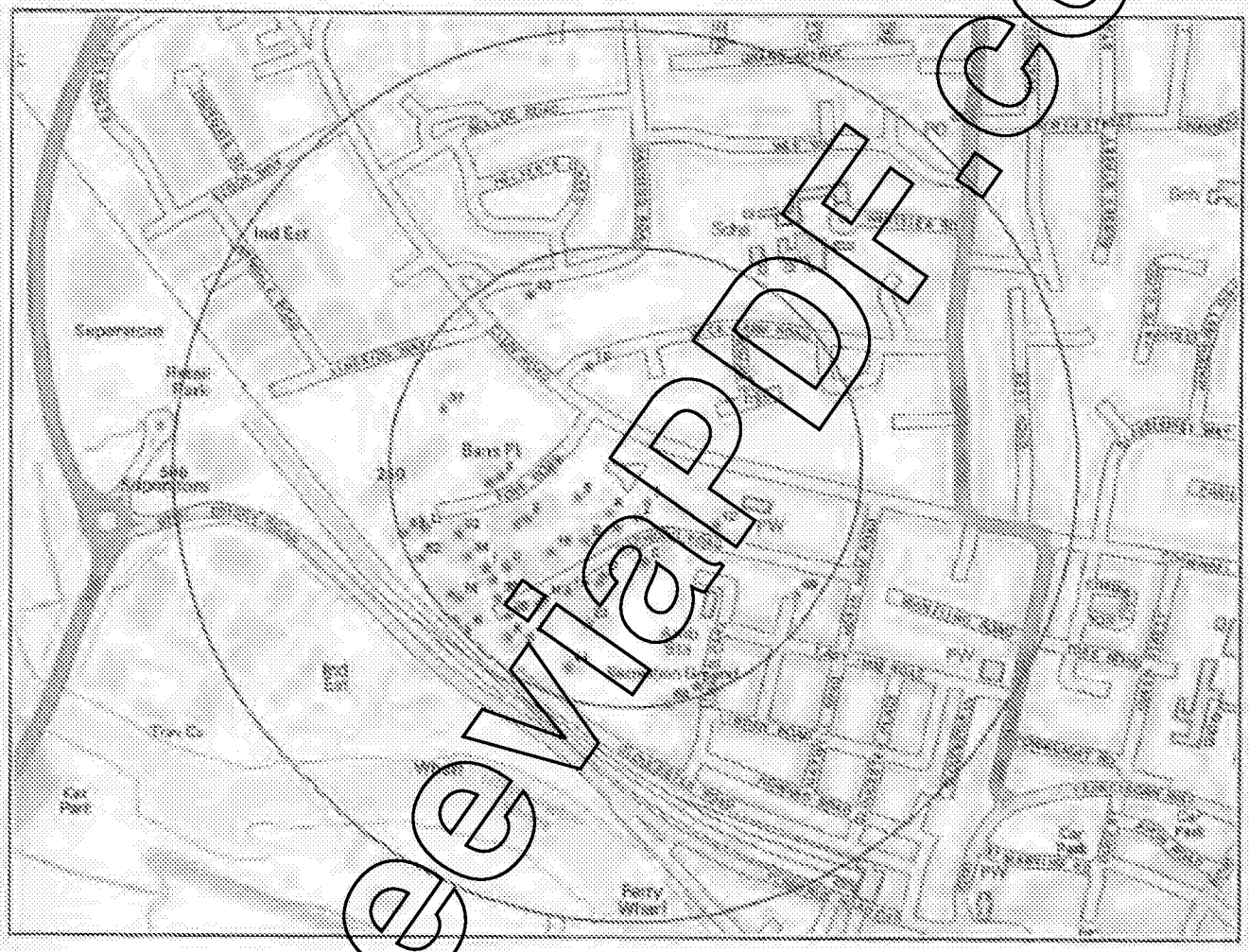
The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details
14A	84.0	N	502350, 102750	Site Address: Unit A, Fort Road Industrial Estate, Littlehampton, West Sussex, BN17 7QU, Type: Clinical Waste Transfer Station, Size: < 25000 tonnes, Regis Licence Number: ETH001, Operator: Ethos Recycling Ltd, Surrendered Date: -, Waste Management Licence No: 10147, Annual Tonnage: 0.0 / Issue Date: 05/07/2006, Expiry Date: -, Effective Date: -, Status: Issued, Modified: -, Site Name: Fort Road Industrial Estate Clinical Waste Transfer Station, Cancelled Date: -, Correspondence Address: -, 35, Bishops Cleeve, Austrey, Atherstone, Warwickshire, CV9 3EU
15A	84.0	N	502350, 102750	Site Address: Unit A, Fort Road Industrial Estate, Littlehampton, West Sussex, BN17 7QU, Type: Clinical Waste Transfer Station, Size: < 25000 tonnes, Regis Licence Number: ETH010, Operator: Ethos Recycling Ltd, Surrendered Date: -, Waste Management Licence No: 10147, Annual Tonnage: 5000.0 / Issue Date: 05/07/2006, Expiry Date: -, Effective Date: 06/04/2009, Status: Transferred, Modified: -, Site Name: Fort Road Industrial Estate Clinical Waste Transfer Station, Cancelled Date: -, Correspondence Address: -, -
16A	84.0	N	502350, 102750	Site Address: Unit A, Fort Road Industrial Estate, Littlehampton, West Sussex, BN17 7QU, Type: Clinical Waste Transfer Station, Size: < 25000 tonnes, Regis Licence Number: ETH013, Operator: Ethos Medical & Special Waste Ltd, Surrendered Date: -, Waste Management Licence No: 10147, Annual Tonnage: 5000.0 / Issue Date: 05/07/2006, Expiry Date: -, Effective Date: 05/03/2010, Status: Transferred, Modified: -, Site Name: Fort Road Industrial Estate Clinical Waste Transfer Station, Cancelled Date: -, Correspondence Address: -, -
17	139.0	[illegible]	502390, 102840	Site Address: Unit A, Fort Road Industrial Estate, Littlehampton, West Sussex, BN17 7QU, Type: Clinical Waste Transfer Station, Size: < 25000 tonnes, Regis Licence Number: ME0048, Operator: Medisort Ltd, Surrendered Date: -, Waste Management Licence No: 10147, Annual Tonnage: 5000.0 / Issue Date: 05/07/2006, Expiry Date: -, Effective Date: 01/07/2010, Status: Transferred, Modified: -, Site Name: Unit A Fort Road Industrial Estate, Cancelled Date: -, Correspondence Address: -, -
18	449.0	W	501770, 102680	Site Address: Units 15/16, Arndale Road, Lineside Ind Est, Littlehampton, West Sussex, BN17 7HD, Type: Clinical Waste Transfer Station, Size: < 25000 tonnes, Regis Licence Number: SRC001, Operator: S R C L Ltd, Surrendered Date: -, Waste Management Licence No: 101116, Annual Tonnage: 0.0 / Issue Date: 23/12/2003, Expiry Date: -, Effective Date: -, Status: Issued, Modified: -, Site Name: Littlehampton Waste Facility, Cancelled Date: -, Correspondence Address: -, -

www.neevia.com

ARUN DISTRICT COUNCIL LU/363/14/PL

4. Current Land Use Map



Current Land Use Legend





Crown Copyright. All rights Reserved.
Licence Number: 100035207

Site Address

Search Buffers (m)

Current Industrial Sites

Petrol & Fuel Sites

Underground High Pressure Oil & Fuel Pipelines

www.neevia.com

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 56

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	Address	Activity	Category
3	24.0	SE	Depot	BN17	Container and Storage	Transport, Storage and Delivery
2	32.0	S	Electricity Sub Station	BN17	Electrical Features	Infrastructure and Facilities
3A	33.0	SW	The Coffee Compass	Fort Road, Wick, Littlehampton, BN17 7QZ	General Manufacturing	Industrial Products
4A	43.0	S	Infinity Print & Embroidery Ltd	Unit 1 Wickham Business Centre, Harwood Road, Littlehampton, BN17 7QU	Plate Makers, Print Finishers and Type Setters	IT, Advertising, Marketing and Media Services
5	46.0	SW	Fort Road Garage	Repair Shop, Fort Road East, Wick, Littlehampton, BN17 7QZ	Vehicle Repair, Testing and Servicing	Repair and Servicing
6	63.0	W	Electricity Sub Station	BN17	Electrical Features	Infrastructure and Facilities
7B	74.0	SW	E M S	Wickham Business Centre, Harwood Road, Littlehampton, West Sussex, BN17 7AU	Vehicle Repair, Testing and Servicing	Repair and Servicing
8B	75.0	SW	Data 3 Patterns & Moulds	Unit 5 Wickham Business Centre, Harwood Road, Littlehampton, BN17 7AU	Special Purpose Machinery and Equipment	Industrial Products
9C	83.0	S	Inpress Plastics Ltd	Factory 1, Harwood Road, Littlehampton, BN17 7AU	Rubber, Silicones and Plastics	Industrial Products
10C	86.0	S	Factory	BN17	Unspecified Works Or Factories	Industrial Features
11D	101.0	S	Metpost Ltd	Harwood Road, Littlehampton, BN17 7SB	General Construction Supplies	Industrial Products
12	106.0	SE	Roofing & Renovation Services Ltd	Enterprise Unit 2, Harwood Road, Littlehampton, BN17 7AT	Metalworkers Including Blacksmiths	Construction Services
13E	107.0	SW	Works	BN17	Unspecified Works Or Factories	Industrial Features
14D	110.0	S	Works	BN17	Unspecified Works Or Factories	Industrial Features
15	112.0	SW	Acorn Print Finishers Ltd	Unit 9-10 Wickham Business Centre, Harwood Road, Littlehampton, BN17 7AU	Plate Makers, Print Finishers and Type Setters	IT, Advertising, Marketing and Media Services
16	114.0	S	Electricity Sub Station	BN17	Electrical Features	Infrastructure and Facilities
17E	117.0	SW	Ferrabyrne Ltd	Fort Road, Wick, Littlehampton, BN17 7QU	Rubber, Silicones and Plastics	Industrial Products
18F	122.0	W	Works	BN17	Unspecified Works Or Factories	Industrial Features
19	131.0	SW	Design Packaging Group Ltd	Harwood House, Harwood Road, Littlehampton, BN17 7AU	Packaging	Industrial Products
20	135.0	W	Medisort Ltd	Unit A, Fort Road, Wick, Littlehampton, BN17 7QU	Medical Waste Disposal Services	Health Support Services
21	135.0	W	Medisort Ltd	Unit A, Fort Road, Wick, Littlehampton, BN17 7QU	Waste Storage, Processing and Disposal	Infrastructure and Facilities
22	158.0	SW	Lorlin Electronics Ltd	Unit A, Harwood Road, Littlehampton, BN17 7AU	Electrical Components	Industrial Products

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

23	159.0	S	Works	BN17	Unspecified Works Or Factories	Industrial Features
24 G	161.0	SW	Arun Embroiderers	Unit C/6 Modern Mould Business Centre, Harwood Road, Littlehampton, BN17 7AU	Textiles, Fabrics, Sewing Machines	Consumer Products
25 G	161.0	SW	Z T F Power	Unit C/1 Modern Moulds Business Centre, Harwood Road, Littlehampton, BN17 7AU	Electronic Equipment	Industrial Products
26 G	161.0	SW	Shanes Printers & Finishers Ltd	Unit C2 Modern Moulds Business Centre, Harwood Road, Wick, Littlehampton, BN17 7AU	Published Goods	Industrial Products
27 G	161.0	SW	R K Electrical Contractors Ltd	Unit C3 Modern Moulds Business Centre Harwood Road, Littlehampton, West Sussex, BN17 7AU	Electrical Contractors	Construction Services
28 H	165.0	SW	Works	BN17	Unspecified Works Or Factories	Industrial Features
29 I	180.0	SW	Sign City	Unit B/2 Modern Moulds Business Centre, Harwood Road, Littlehampton, BN17 7AU	Published Goods	Industrial Products
30 I	180.0	SW	Rainmaker Irrigation Co Ltd	Unit B/3 Modern Moulds Business Centre, Harwood Road, Littlehampton, BN17 7AU	Horticultural Equipment	Industrial Products
31 I	180.0	SW	G S R Motors	Unit B/1 Modern Moulds Business Centre, Harwood Road, Littlehampton, BN17 7AU	Vehicle Repair, Testing and Servicing	Repair and Servicing
32 G	183.0	SW	Motorglass	Modern Moulds Business Centre Harwood Road, Littlehampton, West Sussex, BN17 7AU	Vehicle Repair, Testing and Servicing	Repair and Servicing
33	186.0	SW	Warehouse	BN17	Container and Storage	Transport, Storage and Delivery
34	189.0	SW	Noble Autos	Modern Moulds Business Centre, Harwood Road, Littlehampton, BN17 7AU	Vehicle Breakdown and Recovery Services	Personal, Consumer and Other Services
35	195.0	SW	Modern Moulds Business Centre	BN17	Business Parks and Industrial Estates	Industrial Features
36	200.0	SW	Electricity Sub Station	BN17	Electrical Features	Infrastructure and Facilities
37	202.0	W	Electricity Sub Station	BN17	Electrical Features	Infrastructure and Facilities
38 J	202.0	SW	Gas Holder	BN17	Gas Features	Infrastructure and Facilities
39 J	204.0	SW	Gas Holder Station	BN17	Gas Features	Infrastructure and Facilities
40	214.0	NW	[illegible]	8, Manning Road, Wick, Littlehampton, BN17 7NT	Electrical Contractors	Construction Services
41	214.0	S	Works	BN17	Unspecified Works Or Factories	Industrial Features
42 K	219.0	SW	Gas Holder Station	BN17	Gas Features	Infrastructure and Facilities
43 K	220.0	SW	Gas Holder	BN17	Gas Features	Infrastructure and Facilities
44 L	220.0	W	[illegible] Tech Sheet Metal Ltd	Unit 1, Fort Road, Wick, Littlehampton, BN17 7QU	Metalworkers Including Blacksmiths	Construction Services
45 L	223.0	W	K S G	Unit 8, Fort Road, Wick, Littlehampton, BN17 7QU	Vehicle Repair, Testing and Servicing	Repair and Servicing
46 L	223.0	W	Roundstone Garages Ltd	Unit 5, Fort Road, Wick, Littlehampton, BN17 7QU	Vehicle Repair, Testing and Servicing	Repair and Servicing
47 L	223.0	W	G W - Rag	Unit 6, Arundale Industrial Estate, Wick, Littlehampton, West Sussex, BN17 7QU	Vehicle Repair, Testing and Servicing	Repair and Servicing
48	227.0	SW	Becker Underwood Biological Ltd	Unit A1-A3 Modern Moulds Business Centre, Harwood Road, Littlehampton, BN17 7AU	Pest and Vermin Control	Contract Services
49	227.0	SE	Electricity Sub Station	BN17	Electrical Features	Infrastructure and Facilities
50 M	231.0	SW	Works	BN17	Unspecified Works Or Factories	Industrial Features
51	238.0	S	Electricity Sub Station	BN17	Electrical Features	Infrastructure and Facilities

Report Reference: S EMS-128096_175802

www.neviaPDF.com

S2	239.0	SW	K S Fabrications Ltd	Unit 12, Fort Road, Wick, Littlehampton, BN17 7QU	Cutting, Drilling and Welding Services	Engineering Services
S3	244.0	W	Valley Coachworks	Unit 3, Fort Road, Wick, Littlehampton, BN17 7QU	Vehicle Repair, Testing and Servicing	Manufacturing Services
S4	246.0	SW	Electricity Sub Station	BN17	Electrical Equipment	Infrastructure and Facilities
S5	247.0	SW	Tanks	BN17	Tanks (Storage)	Industrial Features
S6	250.0	S	Rkcars Ltd	Unit 3-5, Gloucester Road, Littlehampton, BN17 7RS	Clothing	Clothing and Accessories

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 0

Database searched and no data found.

4.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site: 0

Database searched and no data found.

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.
The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
RBD1-SAGR	RAISED BEACH DEPOSITS, 1	SAND AND GRAVEL
RMD-CSSG	RAISED MARINE DEPOSITS	CLAY, SILT, SAND AND GRAVEL

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

5.3 Bedrock and Solid Geology

The database has been searched on site, including a 50m buffer.

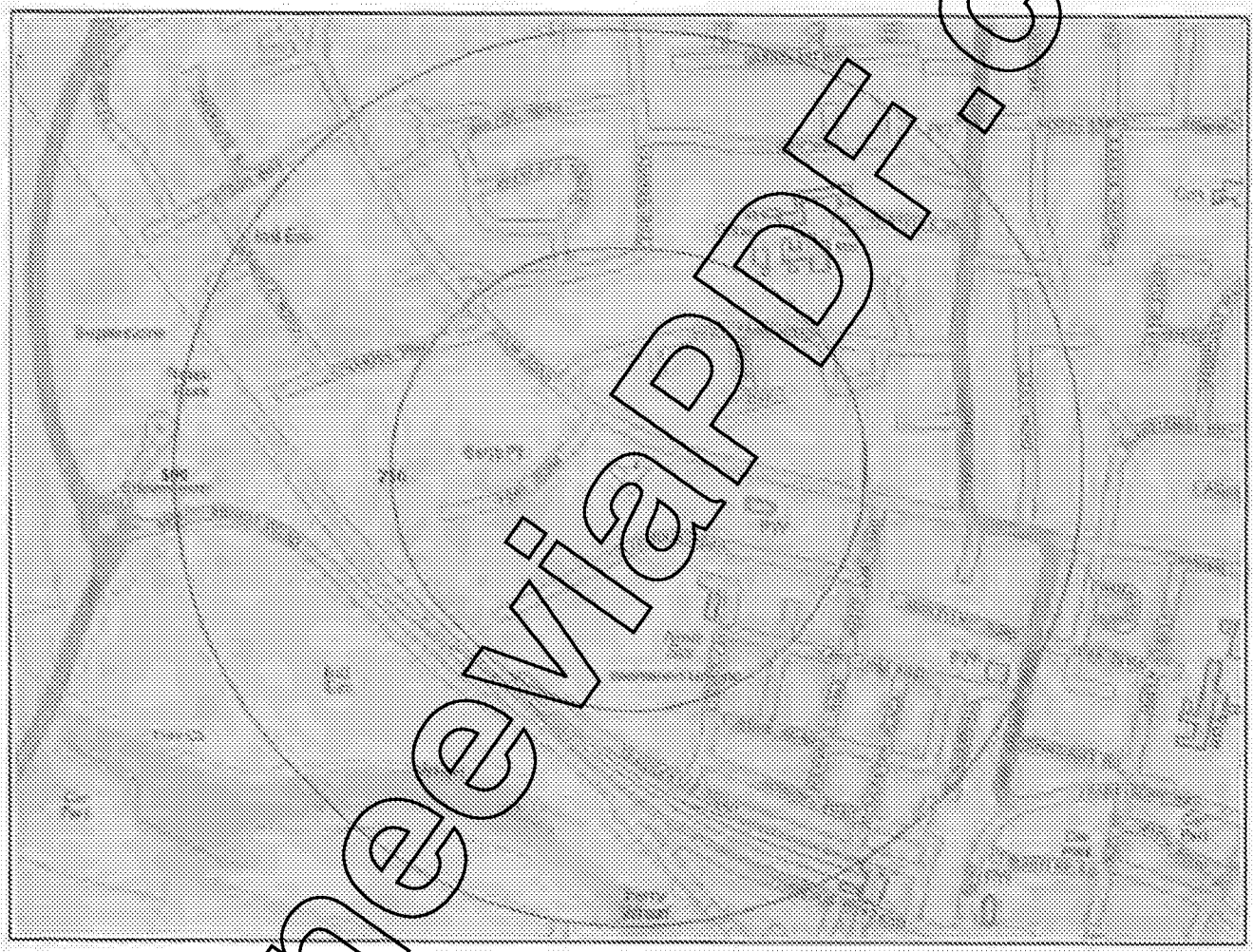
LEx Code	Description	Rock Type
LPOK-CHLK	LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED)	CHALK

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

For more detailed geological and ground stability information please refer to the "GroundSure Geology and Ground Stability Report", available from our website.

www.neaviaPDF.com

6a. Hydrogeology - Aquifer Within Superficial Geology



Aquifer Within Superficial Geology Legend

Crown Copyright, all rights reserved
Licence Number: 100035207

Site Location

Search Buffer (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

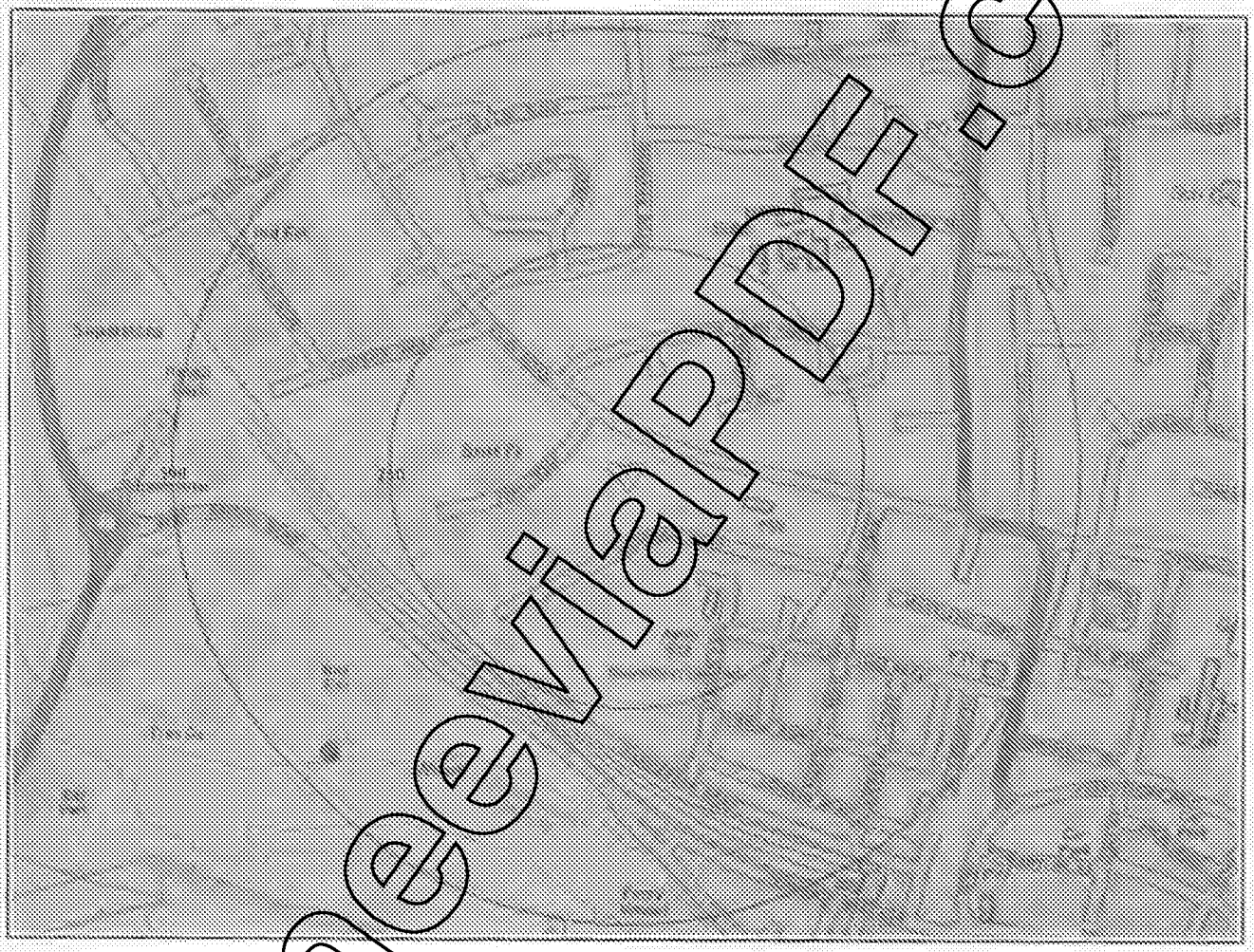
Unproductive

Unknown (data unavailable)

www.neviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

6b. Hydrogeology - Aquifer Within Bedrock Geology and Abstraction Licenses



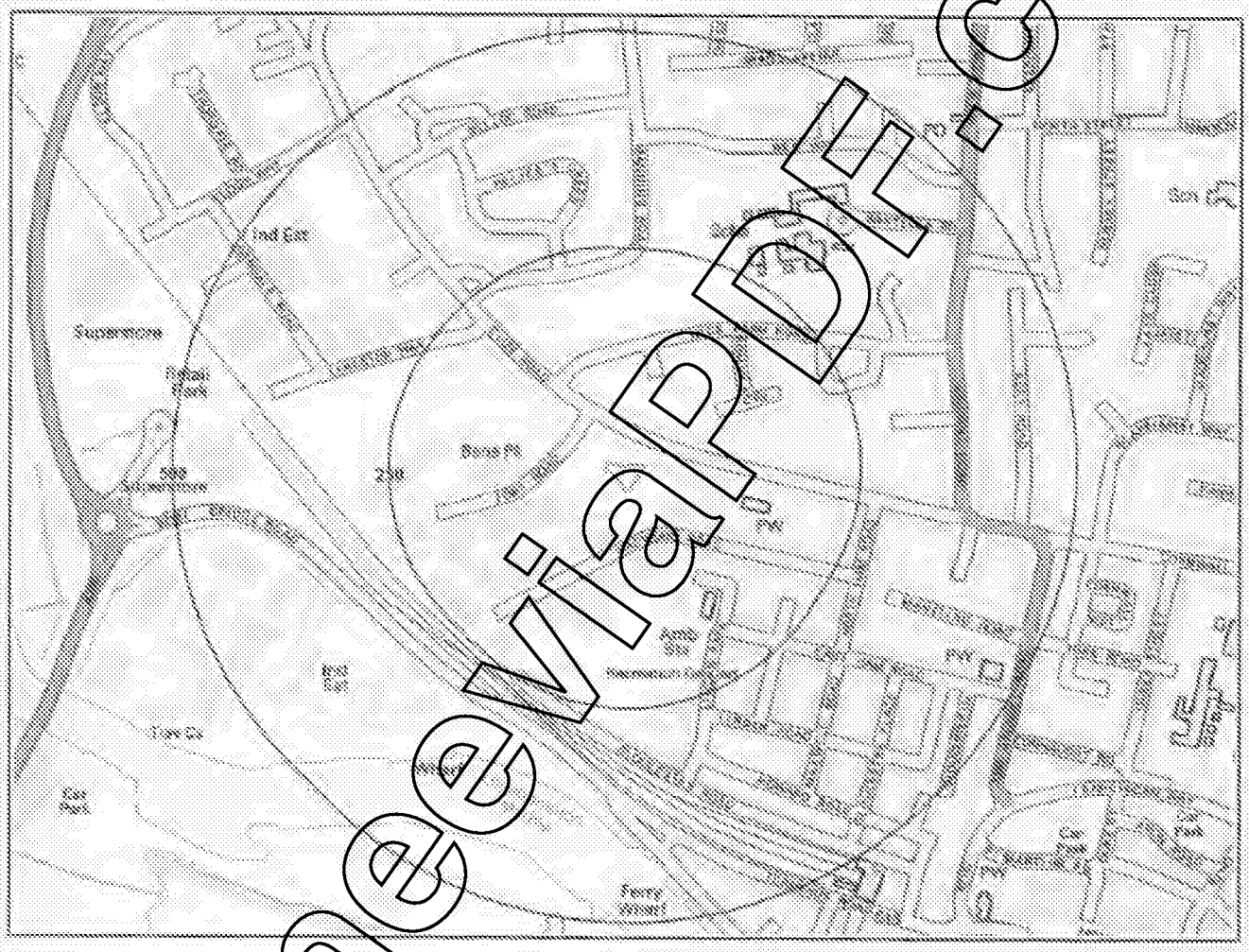
Aquifer Within Bedrock Geology Legend

Ordnance Survey
Crown Copyright. All Rights Reserved
Licence Number: 100035207

- Site Outline
- 250m, 500m, 1000m, 2000m Search Buffers (m)
- Principal Aquifer
- Secondary (A) Aquifer - Permeable Layers
- Secondary (B) Aquifer - Lower Permeability Layers
- Groundwater Abstraction Licence
- Secondary Aquifer - Undifferentiated Layers
- Unproductive
- Unknown (faults and fanning)
- Surface Water Abstraction Licence

www.neviaPDF.com

6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



SPZ and Potable Water Abstraction Licenses
Legend

Ordnance Survey
Crown Copyright. All rights reserved.
Licence number: 100031673

Site Centre

Search Buffers (m)

Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2 - Outer Catchment

Source Protection Zone 3 - Total Catchment

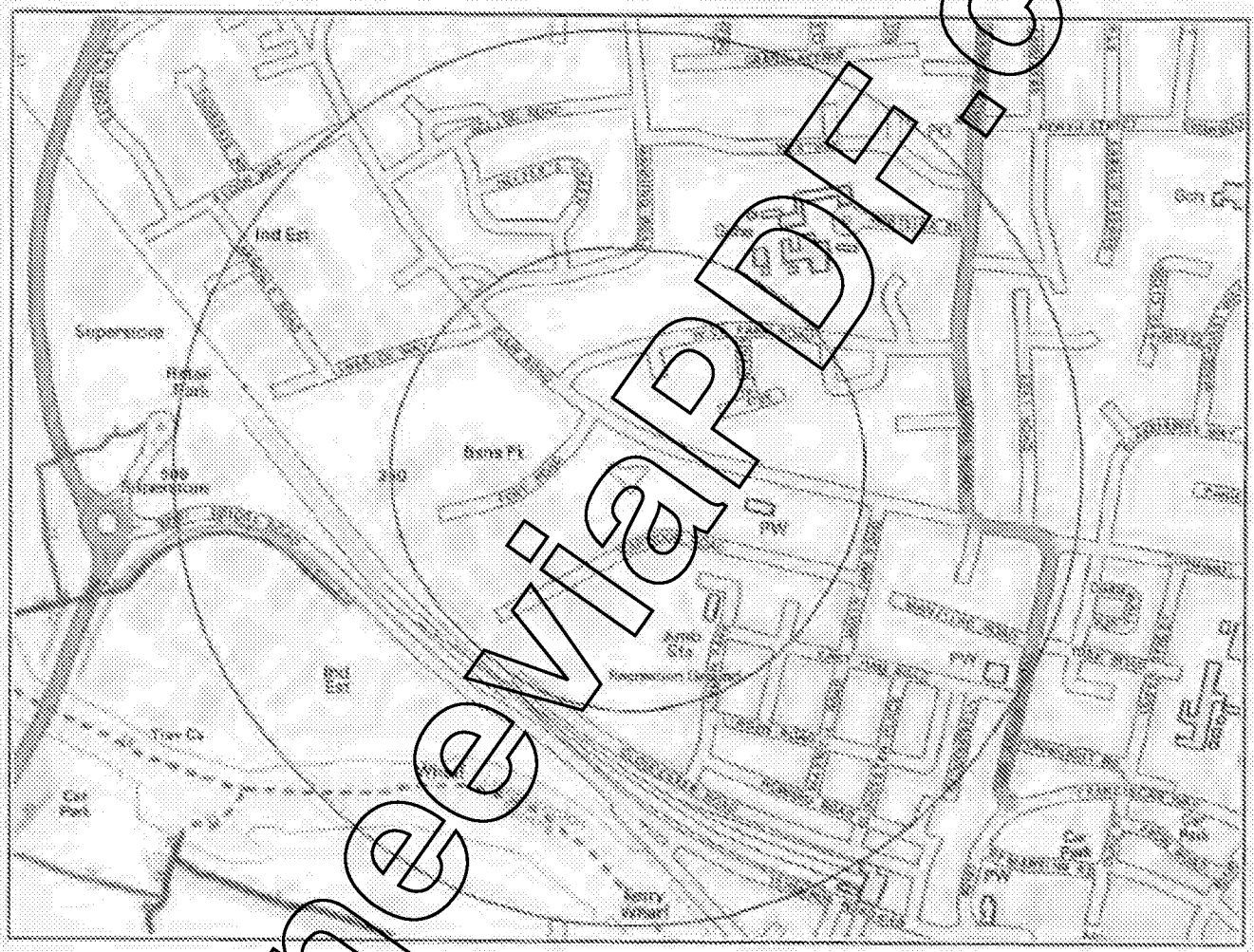
Source Protection Zone 4 - Zone of Special Interest

Potable Water Abstraction Licence

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

6d. Hydrology – Detailed River Network and River Quality



Hydrology Legend

Crown Copyright. All Rights Reserved. Licence Number: 100035207

- Primary River
- Secondary River
- Tertiary River
- Lake/Reservoir
- Underground River (Inferred)
- General Quality Assessment: Chemistry
- Canal
- Canal Tunnel
- Estimated Culvert (passes from 50m)
- OS 10 High (Water Mask)
- OS Inferred Direction
- General Quality Assessment: Biology

www.neviaPDF.com

6. Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Are there records of productive strata within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure EnviroInsight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (5a):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Secondary A	Permeable layers capable of supporting water supplies at local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	379.0	SW	Unknown	Unknown

6.2 Aquifer within Bedrock Deposits

Are there records of productive strata within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the GroundSure EnviroInsight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (5b):

ID	Distance (m)	Direction	Designation	Description
1	0.0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 1000m of the study site? Yes

The following abstraction licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance	Direction	NGR	Details	
2	448.0	SW	501910, 103330	Licence No: 10/41/41102I Details: General Washing/Process Washing Direct Source: Southern Region Groundwater Point: River Arun Estuary Data Type: Point	Annual Volume (m³): 39277.4 Max Daily Volume (m³): 163.65 Original Application No: 189/0538 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 29/10/1997 Version End Date

6.4 Surface Water Abstraction Licences

Report Reference: S EMS-128096_175803

ARUN DISTRICT COUNCIL LU/363/14/PL

www.neeviaPDF.com

Are there any Surface Water Abstraction Licences within 1000m of the study site? **Yes**

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (5b):

ID	Distance	Direction	NGR	Details	
3	666.0	SW	501910, 102210	Licence No: 10/41/411016 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Eyebank Rife And Elmer Rife Data Type: Line	Annual Volume (m³): 27272 Max Daily Volume (m³): 1091 Application No: WR.0809 Original Start Date: - Expiry Date: - Issue No: 100 Version Start Date: 8/12/2005 Version End Date:
4	713.0	SW	501720, 102160	Licence No: 10/41/411016 Details: Spray Irrigation - Direct Direct Source: Southern Region Surface Waters Point: Eyebank Rife Data Type: Line	Annual Volume (m³): 54544 Max Daily Volume (m³): 2182 Application No: - Original Start Date: - Expiry Date: - Issue No: 101 Version Start Date: 8/8/2009 Version End Date:

6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 1000m of the study site? **No**

Database searched and no data found.

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? **No**

Database searched and no data found.

6.7 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site? **No**

Biological Quality:

Database searched and no data found.

Chemical Quality:

Database searched and no data found.

6.8 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? **Yes**

Report Reference: S EMS-128096_175802

ARUN DISTRICT COUNCIL LU/363/14/PL

www.neeviaPDF.com

The following Detailed River Network records are represented on the Hydrology Map (5d):

ID	Distance	Direction	Details
1	331.0	SW	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: - River Type: Secondary River Catchment: - Drain: NO Main River Status: Currently Undefined
2	343.0	SW	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: - River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
3	344.0	W	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: - River Type: Tertiary River Catchment: Drain: YES Main River Status: Currently Undefined
4	348.0	SW	River Name: Drain Water Course Name: Wick Farm Ditch Welsh River Name: - Alternative Name: Lower Arun River Type: Primary River Catchment: Drain: NA Main River Status: Currently Undefined
5	370.0	W	River Name: Drain Water Course Name: Wick Farm Ditch Welsh River Name: - Alternative Name: Lower Arun River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NA Main River Status: Currently Undefined
6	381.0	S	River Name: - Water Course Name: River Arun Welsh River Name: - Alternative Name: River Arun River Type: D/S of High Water Mark Catchment: - Drain: NO Main River Status: Currently Undefined

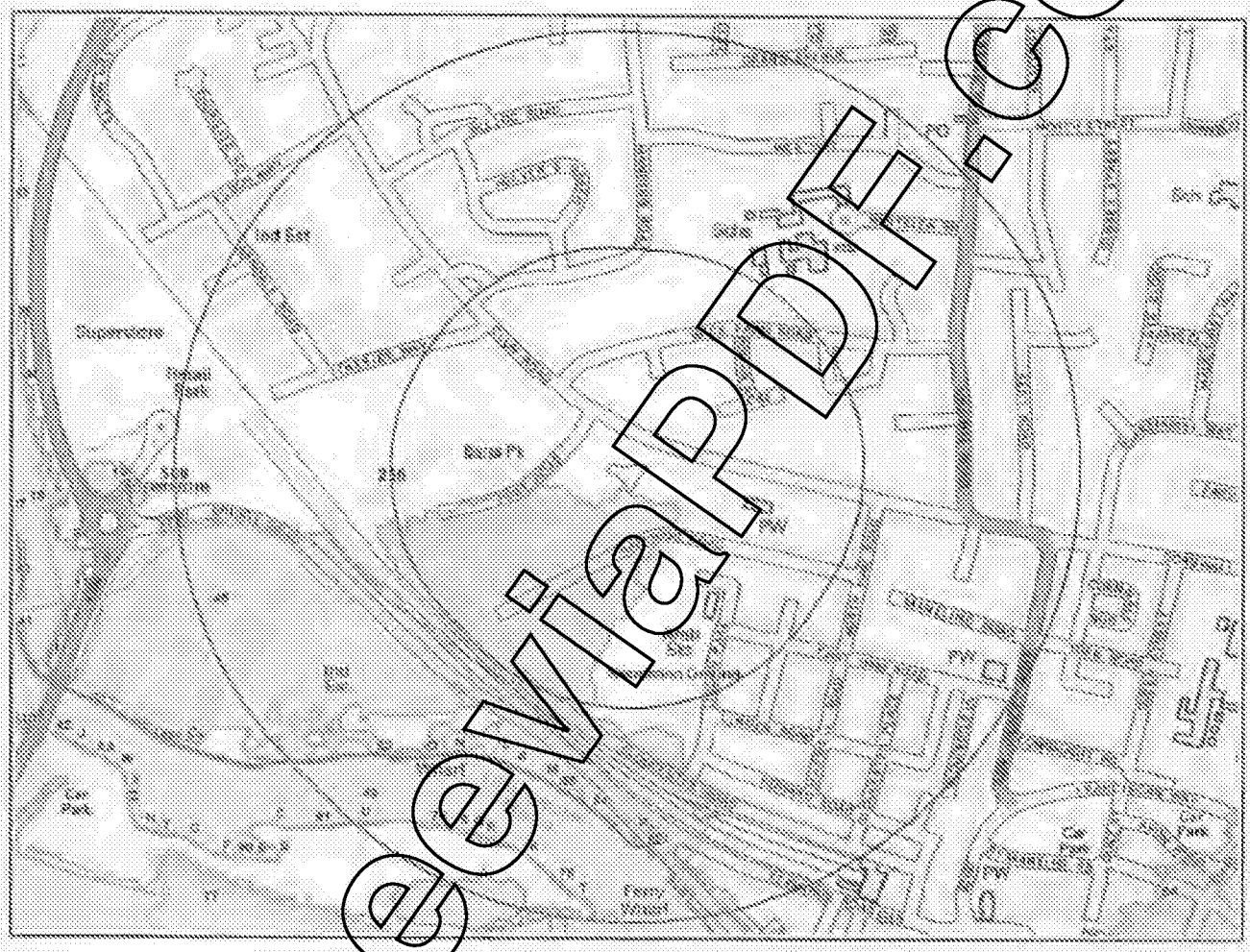
6.9 Surface Water Features

Are there any surface water features within 250m of the study site? **No**

Database searched and no data found.

www.neeviaPDF.com

7. Surface Water Flood Map



www.neoviaPDF.com

7. Flooding

7.1 Zone 2 Flooding

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain? **Yes**

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance (m)	Direction	Update	Type
1	0.0	On Site	04-Apr-2011	Zone 2 (Final Models)

7.2 Zone 3 Flooding

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 3 floodplain? **No**

Database searched and no data found.

7.3 Flood Defences

Are there any Flood Defences within 250m of the study site ? **No**

7.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? **No**

7.5 Areas used for Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? **No**

7.6 Groundwater Flooding Susceptibility Areas

Are there any British Geological Survey groundwater flooding susceptibility flood areas within 50m of the boundary of the study site? **Yes**

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions? **Very High**

Guidance:
Where very high susceptibility is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property types and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

7.7 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? **High**

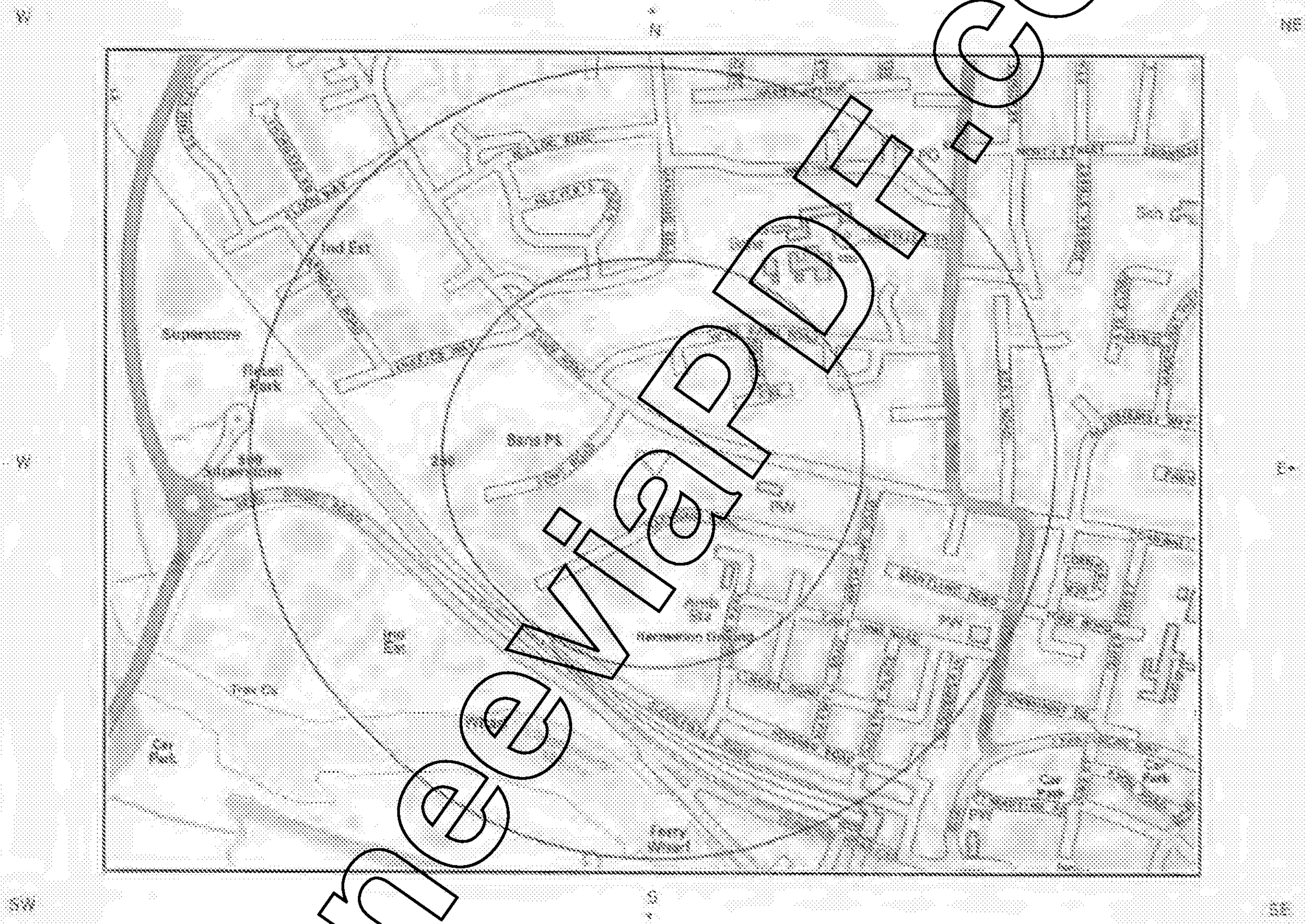
Notes:

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The **confidence rating** is on a threefold scale - Low, Moderate and High. It provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

www.neeviaPDF.com

8.Designated Environmentally Sensitive Sites Map



Designated Environmentally Sensitive Sites Legend

Crown Copyright. All Rights Reserved Licence Number: 100035207

Site Outline

Search Buffers (m)

SAC

SSSI

NNR

World Heritage Sites

SPA

Ramsar

LNR

Environmentally Sensitive Areas

Areas of Outstanding Natural Beauty

Nitrate Sensitive Areas

National Parks

Report Reference: S EMS-128096_175802

www.neeviaPDF.com

8.Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 500m of the study site? No

Records of Sites of Special Scientific Interest (SSSI) within 500m of the study site: 0

Database searched and no data found.

Records of National Nature Reserves (NNR) within 500m of the study site: 0

Database searched and no data found.

Records of Special Areas of Conservation (SAC) within 500m of the study site: 0

Database searched and no data found.

Records of Special Protection Areas (SPA) within 500m of the study site: 0

Database searched and no data found.

Records of Ramsar sites within 500m of the study site: 0

Database searched and no data found.

Records of Local Nature Reserves (LNR) within 500m of the study site: 0

Database searched and no data found.

Records of World Heritage Sites within 500m of the study site: 0

Database searched and no data found.

Records of Environmentally Sensitive Areas within 500m of the study site: 0

Database searched and no data found.

Records of Areas of Outstanding Natural Beauty (AONB) within 500m of the study site: 0

Database searched and no data found.

Records of National Parks (NP) within 500m of the study site: 0

Database searched and no data found.

www.neaviaPDF.com

Records of Nitrate Sensitive Areas within 500m of the study site:

Database searched and no data found.

www.neeviaPDF.com

9. Additional Information

9.1 Mobile Phone Transmitter Locations

GroundSure's unique mobile phone transmitter database.

Have any mobile phone transmitters been identified within 250m of the study site? **No**

Database searched and no data found.

9.2 Existing and potential OfCom Telecommunication Mast Locations

OfCom telecommunication base station and mast data, which details the height and proposed location of masts over 30 metres in height or with a power level exceeding 17dBW.

Have any OfCom telecommunication masts been identified within 250m of the study site? **Yes**

The following records within 250m have been found within this search:

Distance (m)	Direction	OfCom Reference	Address	Approx. Mast Height (m)
35.0	N	U(P)3774	West Sussex, Littlehampton, Fort Rd 1nd Est	31

9.3 Pylons and Electricity Transmission Lines

Have any overhead transmission lines or pylons been identified in proximity to the study site? **No**

Guidance:Please be aware that the findings contained within overhead power transmission lines and pylons dataset relates to Ordnance Survey Point X data, which identifies points along the transmission network. Therefore sometimes certain features may not appear in the report. The database is searched up to 500m.

www.neeviaPDF.com

10. Natural Hazards Findings

10.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information, please obtain a GroundSure Geology and Ground Stability Report, Available from our website. The following information has been found:

10.1.1 Shrink Swell

What is the maximum Shrink-Swell® hazard rating identified on the study site? **Negligible**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs and increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

10.1.2 Landslides

What is the maximum Landslide® hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

10.1.3 Soluble Rocks

What is the maximum Soluble Rocks® hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Significant soluble rocks are present, but with few dissolution features and no recorded subsidence. Problems unlikely except with considerable change to surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.

10.1.4 Compressible Ground

What is the maximum Compressible Ground® hazard rating identified on the study site? **Negligible**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits, no special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

10.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

10.1.6 Running Sand

What is the maximum Running Sand* hazard rating identified on the study site? **Very Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Very low potential for running sand problems if [illegible] or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand, no special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

* This indicates an automatically generated 50m buffer around site.

10.2 Radon

What is the maximum radon potential at the study site?
The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level

---

Is the property in an area where radon protection measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?

No radon protective measures are necessary

Guidance: The responses given on the level of radon protective measures required are based on a joint radon potential dataset from the Health Protection Agency (HPA) and the British Geological Survey (BGS). No radon protection measures are required.

---

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

11. Mining

11.1 Coal Mining

Are there any coal mining areas within 75m of the study site? **No**

Database searched and no data found.

11.2 Shallow Mining

What is the hazard of subsidence relating to shallow mining on site (including a 150m buffer)? **Low**

Guidance: Where low potential is indicated, this means that the rocks underlying the area are of a type known to have been mined at shallow depth in some parts of the UK, but that it is unlikely to be of significant concern in this area. However, it is recommended that you do obtain a Coal Authority mining search in this area, which will provide a comprehensive search of former mining activity, including coal mining at deeper levels.

11.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? **No**

Database searched and no data found.

www.neeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

12.Contacts

GroundSure Helpline
Telephone: [redacted]

British Geological Survey (England & Wales)
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: [redacted] Email: [redacted]
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general geological enquiries

Environment Agency
Tel: [redacted]
Sussex
Saxon House - Little High Street, Worthing, West Sussex, BN11 1DH
Web: www.environment-agency.gov.uk
Email: [redacted]

Health Protection Agency
Chilton, Didcot, Oxon, OX11 0RQ
Tel: [redacted]
Radon measures and general radon information and guidance

The Coal Authority
200 Lichfield Lane, Mansfield, Notts NG18 4RG
[redacted]
www.coal-authority.co.uk
Coal mining reports and related enquiries

Ordnance Survey
Romsey Road
Southampton SO16 4GU
[redacted]

Local Authority
Authority: Arun District Council
[redacted]
Web: www.arun.gov.uk
Address: The Arun Civic Centre, Maltravers Road, Littlehampton, West Sussex, BN17 5LF

Get Mapping Plc
Virginia Villas, High Street, Hartley Wintney, Hampshire RG27 8NW
[redacted]

CoPSO
24 Market Street, London W1G 9QR
[redacted]
(www.copso.org.uk)

Ordnance Survey
This product includes map data licensed from Landmark Information Group Limited®
© Crown Copyright 2003 and Landmark Information Group Limited® 2003. All Rights Reserved.

Natural England holds information, National Nature Reserves, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, English Nature who retain the Copyright and Intellectual Property Rights for the data.

Contains © Database Rights/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [0342100].

This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for use of this report.

Report Reference: S EMS-128096_175802

www.neeviaPDF.com

Search Code

Important Consumer Protection Information
This report is produced by GroundSure Ltd, of Lees House, 21 Dyke Road, Brighton, BN1 3FE. [redacted]
Fax: [redacted] GroundSure are committed to providing high quality leading environmental reports. GroundSure is registered with the Property Codes Compliance Board (PCCB) as a subscriber to the Search Code. The PCCB independently monitors how registered firms maintain compliance with the Code.

The Search Code provides protection for homebuyers, sellers, conveyancers and mortgage lenders who rely on property search reports carried out on residential property within the United Kingdom. It sets out minimum standards which firms compiling and/or selling search reports have to meet. By giving you this information, your search provider is confirming that they keep to the principles of the Code. This provides important protection for you.

The Code's core principles
Search providers which subscribe to the Code will:

- Display the Code logo prominently on their search report.
- Act with integrity and carry out work with due skill, care and diligence.
- At all times maintain adequate and appropriate insurance to protect consumers.
- Conduct business in an honest, fair and professional manner.
- Handle complaints speedily and fairly.
- Ensure that all search services comply with the law, registration rules and standards.
- Monitor their compliance with the Code.

Complaints

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure. If you remain dissatisfied with the firm's final response after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award compensation of up to £5,000 to you if he finds that you have suffered actual loss as a result of your search provider failing to keep to the Code.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs or to the PCCB.

TPOs Contact Details:
The Property Ombudsman scheme
Beckett House
4 Bridge Street
Salisbury
Wiltshire SP1 2LX
[redacted]

You can get more information about the PCCB from www.propertycodes.org.uk.

PLEASE ASK YOUR SEARCH PROVIDER IF YOU WOULD LIKE A COPY OF THE SEARCH CODE

www.neaviaPDF.com

Report Reference: S EMS-128096_172802

Ground Standard Terms and Conditions

www.neviaPDF.com

www.neaviaPDF.com

Appendix C Arun District Council Search Records.

www.neeviaPDF.com

© Terrapin Environmental Consultants 2011

ARUN
DISTRICT COUNCIL

Arun District Council
Civic Centre
Maltravers Road
Littlehampton
West Sussex, BN17 5LF
[redacted]
Web: www.arun.gov.uk/eh
[redacted]

Paul Brewer
Terragen
The Ridings,
4 Village Close,
Sherington,
Bucks,
MK16 9PZ

26th May 2011
Please ask for:
Matthew Kennett
Environmental Health
[redacted]

Your Ref:

Our Ref: EH/MRK/C186900

Dear Paul Brewer

Environmental Information Regulations 2004
Fort Road Garage, Fort Road East, Littlehampton, BN17 5QZ

Thank you for your request for information.

- Historical maps from 1876 to 1932 indicate the site was not developed until after 1911. The 1932 map shows a depot and destructor works within approximately 5 metres of the south western boundary of the site.
- Please find attached a print out of the planning history from 1947 of the vicinity.
- The land is considered as potentially contaminated land due to the historical industrial use. It is currently lower on the priority list as the site is in a commercial use. Our GIS system has the property named as the Old Mower Workshop.
- The site geology is Raised Beach Deposits over the Lewes Nodular Chalk. The Chalk is a principle aquifer but not in a source protection zone.
- There is one relevant Environment Agency pollution incident on the adjacent site to the east (Verdant Depot). It was classified as a minor pollution incident to air and land involving a fire in 2002. The Verdant Depot also has fuel storage in the form of underground diesel tanks located west of the centre of the depot.
- There are no waste management sites with 250m of the site.
- There is a permitted facility approximately 350m to the southwest; EPR - Section 3.5, Part B(e) Production of Coated Road stone at Tarmac Southern Ltd., Quaysides, Littlehampton, West Sussex, BN17 5DD.
- There is a permitted facility approximately 540m to the northwest; EPR - Section 2.2 Part B(d) Melting Aluminium at Freecast Foundry Ltd, Unit 1, Lineside Way, Lineside Industrial Estate, Littlehampton, West Sussex, BN17 5EH.
- We do not hold any details of Private Water Supplies within 500m of the site or any discharge consents within 250m.

Arun District Council makes every effort to ensure that the Environmental Information it holds is accurate. However, it cannot be held responsible for the accuracy and interpretation of any Environmental Information provided.

Yours sincerely

[redacted]

Matthew Kennett
Pollution Officer

ARUN DISTRICT COUNCIL DS/WP/PL

www.ineedaPDF.com

www.neeviaPDF.com

ARUN DISTRICT COUNCIL
South Downs National Park Authority

PUBLIC

SITE HISTORY

The enclosed information is a complete record of the planning applications and Building Regulation submissions received against this property/site since 1948 compiled from our available records.

It is, as far as we are aware, a true and accurate record, however this Authority accepts no liability for any errors or omissions.

Arun District Council
Arun Civic Centre
Maltravers Road
Littlehampton
West Sussex
BN17 5LF

Any queries please refer to:

[redacted]

Report run on: 26-MAY-2011

www.neeVia PDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Location: Fort Road Community Park (MS) Fort Road Fort Road Littlehampton BN17 6DU

Grid Ref: East 2260 North 2625

OS Sheet No.s: G16NW TQ0202

Classifications:
ADOPTED LOC PLN
NO PUBLIC SEWER

Related Sites

Site No	Location	Relationship
200002708478	Old Workshop (Fort Road)	PS
LU-372-06	Enterprise Units 1-6 (CS) Harwood Roa	SS
LU-665-81	Pepperville House (Arun East Communit	PS
LU-665-82	Pepperville House (Travelling Day Hospi	PS
LU-665-83	The Studio - United Response (Fort Roa	PS
LU-665-84	Units (SS) Coffee Compass Static Graph	SS

Application: LU/384/87/B
Description: Development of second floor vacant area into office accommodation
Address: Architects Studio Fort Road Offices Fort Road Littlehampton West Sussex
Decision: Passed **Date:** 02-11-1987
Appeal Dec: **Date:**

Application: LU/411/87
Description: Application under Regulation 4(5) for change of use of vacant area to office accommodation
Address: Architects Studio Fort Road Depot Fort Road Littlehampton West Sussex
Decision: Approve **Date:** 21-10-1987
Appeal Dec: **Date:**

www.neevia PDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Application: LU/166/88/B
Description: Single storey rear extension and general alterations
Address: The Cottages Fort Road Littlehampton West Sussex
Decision: Passed **Date:** 10-03-1988
Appeal Dec: **Date:**

Application: LU/200/88
Description: Application under Regulation 4 of the Town & Country Planning General Regulations 1976 for proposed extension to 'The Cottages'
Address: Fort Road Depot Fort Road Littlehampton West Sussex
Decision: Deemed Perm Cnd **Date:** 18-05-1988
Appeal Dec: **Date:**

Application: LU/330/89
Description: Application under Regulation 4 of the Town & Country Planning General Regulations 1976 for extension to existing vehicle workshop
Address: Fort Road Depot Fort Road Littlehampton
Decision: Deemed Perm Cnd **Date:** 30-08-1989
Appeal Dec: **Date:**

Application: LU/411/89/B
Description: Construction of new vehicle workshop and various alterations to existing buildings
Address: Harwood Road Depot Harwood Road Littlehampton West Sussex
Decision: Rejected **Date:** 30-10-1989
Appeal Dec: **Date:**

Application: LU/545/89/B
Description: Construction of new vehicle workshop & various alterations to existing buildings
Address: Harwood Road Depot Harwood Road Littlehampton West Sussex
Decision: Passed **Date:** 02-01-1990
Appeal Dec: **Date:**

www.nevlaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Application: LU/305/91
Description: Application under Regulation 5 of the Town & Country Planning General Regulations 1976 for change of use from Council Depot to Part B1, B2, B8, D1 and other uses of the various buildings as identified on the list attached to the application form.
Address: Fort Road Depot Fort Road Littlehampton West Sussex
Decision: Deemed Perm Cnd **Date:** 11-12-1991
Appeal Dec: **Date:**

Application: LU/306/91/BN
Description: Building Notice to strengthen mezzanine floor, provide 1/2hr fire protection, guard rails to mezzanine and staircase
Address: ADC Enterprise Unit 3 Harwood Road Littlehampton West Sussex
Decision: Accepted **Date:** 12-11-1991
Appeal Dec: **Date:**

Application: LU/116/92/BN
Description: Building Notice - alter doorways, build ramps to entrances, new toilets, new opening through main wall.
Address: Architects Studio Fort Road Depot Fort Road Littlehampton West Sussex
Decision: Accepted **Date:** 07-05-1992
Appeal Dec: **Date:**

Application: LU/156/92
Description: Use of premises for garaging of vehicles prior to hiring with alterations to elevations
Address: Old Arun District Council Depot Fort Road Littlehampton
Decision: Approve Cond **Date:** 06-08-1992
Appeal Dec: **Date:**

Application: LU/246/92
Description: Siting of portakabin adjacent to former mower workshop for office use - Class B1
Address: Fort Road Depot Fort Road Littlehampton West Sussex
Decision: Approve Cond **Date:** 27-11-1992
Appeal Dec: **Date:**

www.neoViaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Application: LU/46/95/B
Description: Alterations to existing building to offices
Address: Peppervill House Fort Road Industrial Estate Littlehampton
Decision: Passed Condit'n **Date:** 21-04-1995
Appeal Dec: **Date:**

Application: LU/63/95
Description: Change of use of existing store to offices
Address: Pepperville House Fort Road Industrial Estate Fort Road Littlehampton
Decision: Approve Cond **Date:** 09-05-1995
Appeal Dec: **Date:**

Application: LU/165/95/A
Description: 1no.non-illuminated semi-circular double pole sign with up to 8 panels below giving names of the various occupiers.
Address: Grass verge at front entrance to Fort Road Community Park (Former Fire Brigade Depot) Fort Road Littlehampton
Decision: Approve Cond **Date:** 14-08-1995
Appeal Dec: **Date:**

Application: LU/70/96/BN
Description: Building Notice for re-roofing
Address: Old Architects Studio Fort Road Littlehampton
Decision: Accepted **Date:** 28-03-1996
Appeal Dec: **Date:**

Application: LU/[illegible]/96
Description: Erection of moveable telecommunications mast and associated ancillary development
Address: Land at Fort Road Industrial Estate Littlehampton
Decision: Approve Cond **Date:** 09-10-1996
Appeal Dec: **Date:**

Application: LU/226/96
Description: Replacement portacabin within depot for staff changing, toilet, washing & rest room facilities
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Approve **Date:** 26-11-1996
Appeal Dec: **Date:**

www.neeviaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Application: LU/208/98/BN
Description: Alterations to garage 2
Address: Arun DC Depot Harwood Road Littlehampton
Decision: Accepted **Date:** 24-06-1998
Appeal Dec: **Date:**

Application: LU/290/98/BR
Description: Formation of toilets, canteen and offices.
Address: Onyx (UK) Limited Harwood Industrial Estate Harwood Road Littlehampton
Decision: Passed Condit'n **Date:** 15-01-1999
Appeal Dec: **Date:**

Application: LU/152/01/BR
Description: Mezzanine
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Rejected **Date:** 22-07-2001
Appeal Dec: **Date:**

Application: LU/144/02/BR
Description: Installation of new windows to north elevation
Address: The Studio Fort Road Community Park Wick, Littlehampton
Decision: Passed Condit'n **Date:** 05-07-2002
Appeal Dec: **Date:**

Application: LU/167/02/
Description: Installation of 4 no. new windows to the northern elevation
Address: The Studio Fort Road Community Park Littlehampton
Decision: Approve Cond **Date:** 30-07-2002
Appeal Dec: **Date:**

Application: LU/204/02/BR
Description: Fire Damage Reinstatement
Address: Harwood Road Depot Harwood Road Littlehampton BN17 7AT
Decision: Passed Condit'n **Date:** 14-11-2002
Appeal Dec: **Date:**

www.freeviaPDF.com

ARUN DISTRICT COUNCIL LU/363/14/PL

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Application: LU/158/04/
Description: Application under Regulation 3 of the Town and Country Planning General Regulations 1992 for a new link access road & footway between Harwood Rd & Fort Rd and the creation of turning area/cul de sac in Harwood Road.
Address: Land between Harwood Road & Fort Road (Part of Fort Road Community Park) Littlehampton
Decision: Approve Cond **Date:** 28-07-2004
Appeal Dec: **Date:**

Application: LU/325/05/
Description: Change of use from LPG storage yard to car valeting, vehicle leasing and sale of ex lease vehicles.
Address: Old Mower Workshop Fort Road Depot Fort Road Littlehampton
Decision: Refused **Date:** 15-03-2006
Appeal Dec: **Date:**

Reference: LU/101/84
Description: Prefabricated office accommodation
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Approve Cond **Date:** 25-04-1984
Appeal Dec: **Date:**

Reference: LU/107/82/S
Description: Raised floor with new workshop
Address: A D C Depot Harwood Road Littlehampton
Decision: Permitted **Date:** 24-06-1982
Appeal Dec: **Date:**

Reference: LU/11/56
Description: Use of triangular plot of land as a car park
Address: Land on east side of Fort Road Littlehampton
Decision: Approved **Date:** 04-02-1956
Appeal Dec: **Date:**

Reference: LU/110/80/B
Description: Extension to existing garages
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Permitted **Date:** 21-04-1980
Appeal Dec: **Date:**

www.neeviaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Reference: LU/129/70
Description: Extension to mechanics workshop and two additional garages
Address: Council Depot Harwood Road Littlehampton
Decision: Approved **Date:** 15-05-1970
Appeal Dec: **Date:**

Reference: LU/13/55
Description: Erection of building for civil defence purposes
Address: Land adjacent 36 Harwood Road Littlehampton
Decision: Approved **Date:** 25-02-1955
Appeal Dec: **Date:**

Reference: LU/15/65
Description: Renewal of temporary consent for the erection of a RSPCA hut
Address: East side of Fort Road between 75 Clun Road and R W Scott Works Littlehampton
Decision: Approve Cond **Date:** 11-02-1965
Appeal Dec: **Date:**

Reference: LU/18/65
Description: Erection of an entrance gate offices and toilets
Address: Harwood Road Depot Adjoining Industrial Estate Littlehampton
Decision: Approved **Date:**
Appeal Dec: **Date:**

Reference: LU/191/84/B
Description: Prefabricated temporary office accommodation
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Permitted **Date:** 08-08-1984
Appeal Dec: **Date:**

Reference: LU/194/72
Description: Use of land for residential purposes
Address: Land on south east side of Fort Road between 65-75 Clun Road/Perrymatics Littlehampton
Decision: Approved **Date:** 03-07-1972
Appeal Sec: **Date:**

www.neeviaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Reference: LU/20/56
Description: Outline application use of plot of land for erection of a social centre
Address: East Side of Fort Road Littlehampton
Decision: Approved — **Date:** 19-07-1956
Appeal Dec: **Date:**

Reference: LU/217/63
Description: Renewal of temp consent
Address: Land south of Fort Road Littlehampton
Decision: Approve Cond — **Date:** 13-09-1963
Appeal Dec: **Date:**

Reference: LU/219/82/R
Description: Relax of E5 for raised storage area
Address: A D C Depot Harwood Road Littlehampton
Decision: — **Date:** 24-06-1982
Appeal Dec: **Date:**

Reference: LU/220/61
Description: Portable shed
Address: Fort Road Littlehampton
Decision: Temp Permission — **Date:** 13-10-1961
Appeal Dec: **Date:**

Reference: LU/253/79
Description: Proposed substation
Address: Fort Road Arundel Industrial Estate Littlehampton
Decision: No Objection — **Date:** 20-06-1979
Appeal Dec: **Date:**

Reference: LU/258/66/R
Description: Lean to roofing to existing wash down to form garage and salt store
Address: Harwood Road Industrial Estate Littlehampton
Decision: Permitted — **Date:** 30-08-1966
Appeal Dec: **Date:**

Reference: LU/261/61
Description: Garage for three cars
Address: Harwood Road Littlehampton
Decision: Approved — **Date:** 19-12-1961
Appeal Dec: **Date:**

www.neviaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Reference: LU/278/86
Description: Conversion of storage building to Architects drawing office
Address: Council Depot Ford Road Littlehampton
Decision: Approved **Date:** 03-09-1986
Appeal Dec: **Date:**

Reference: LU/278/86/B
Description: Conversion of storage building to Architects drawing office
Address: Council Depot Ford Road Littlehampton
Decision: Permitted **Date:** 21-10-1986
Appeal Dec: **Date:**

Reference: LU/287/63
Description: Construction of mechanics shop and garages and erection of concrete post and panel fence
Address: Harwood Road Part of Council Depot Littlehampton
Decision: Approved **Date:** 10-01-1964
Appeal Dec: **Date:**

Reference: LU/31/84/B
Description: Sub division to form stores and ancillary offices
Address: Carpenters Workshop Harwood Road Depot Harwood Road Littlehampton
Decision: Permitted **Date:** 08-02-1984
Appeal Dec: **Date:**

Reference: LU/344/67
Description: Use as car park to serve adjoining factory premises
Address: Land south east of Fort Road between 65-75 Fort Road Littlehampton
Decision: Approve Cond **Date:** 05-01-1968
Appeal Dec: **Date:**

Reference: LU/35/77/B
Description: Conversion of garage to drying room & two workshops
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Permitted **Date:** 11-02-1977
Appeal Dec: **Date:**

www.neoviaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Reference: LU/352/66
Description: Field to be used for grazing one horse and shelter to be erected
Address: RSPCA field in Fort Road Littlehampton
Decision: Approve Cond **Date:** 20-01-1967
Appeal Dec: **Date:**

Reference: LU/36/84/B
Description: 2 No concrete garages
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Permitted **Date:** 02-02-1984
Appeal Dec: **Date:**

Reference: LU/37/83/B
Description: Removal of section of firebreast at first floor level and the provision of new fire-resisting door
Address: Harwood Road Cottages Harwood Road Littlehampton
Decision: Permitted **Date:** 31-01-1983
Appeal Dec: **Date:**

Reference: LU/370/76
Description: Erection of 80 ft high pole for radio telephone aerial on roof of workshop
Address: Council Depot Harwood Road Littlehampton
Decision: Approve Cond **Date:** 09-12-1976
Appeal Dec: **Date:**

Reference: LU/374/68
Description: Renewal of LU/6/68
Address: Land south of Fort Road Littlehampton
Decision: Temp Permission **Date:** 24-01-1969
Appeal Dec: **Date:**

Reference: LU/407/72
Description: Change of use to car park
Address: Fort Road Littlehampton
Decision: Approved **Date:** 12-10-1972
Appeal Dec: **Date:**

www.neoviaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Reference: LU/44/85
Description: Provision of five industrial starter units with hard standing for parking and deliveries
Address: Land Forming part of Arun District Council Harwood Road Depot Harwood Road Littlehampton
Decision: Approve Cond — **Date:** 20-02-1985
Appeal Dec: — **Date:**

Reference: LU/45/66
Description: Renewal of temporary consent for precast concrete building for the manufacture and storage of torches
Address: Land south of Fort Road Littlehampton
Decision: Approve Cond — **Date:** 24-03-1966
Appeal Dec: — **Date:**

Reference: LU/455/72
Description: Two storey office block garage and car park
Address: Fort Road Littlehampton
Decision: Withdrawn — **Date:** 07-12-1972
Appeal Dec: — **Date:**

Reference: LU/470/78/B
Description: Install 2 new windows 1 new doorway 2 access ways through internal walls
Address: A D C Depot Harwood Road Littlehampton
Decision: Permitted — **Date:** 11-10-1978
Appeal Dec: — **Date:**

Reference: LU/58/66
Description: Outline application for the erection of a youth club
Address: Land on south side of Fort Road Littlehampton
Decision: No Objection — **Date:** 06-05-1966
Appeal Dec: — **Date:**

Reference: LU/59/85/B
Description: Provision of five industrial starter units with hard standing for parking and deliveries
Address: Land Forming Part of Arun District Council Harwood Road Depot Harwood Road Littlehampton
Decision: Permitted — **Date:** 04-03-1985
Appeal Dec: — **Date:**

www.neoViaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-666-80

Reference: LU/6/68
Description: Proposed renewal for precast concrete building
Address: Land south of Fort Road Littlehampton
Decision: Temp Permission **Date:** 16-02-1968
Appeal Dec: **Date:**

Reference: LU/62/57
Description: Erection of concrete building for torch making and storage
Address: Fort Road Littlehampton
Decision: Temp Permission **Date:** 12-07-1957
Appeal Dec: **Date:**

Reference: LU/620/78
Description: Replacement of existing fence with new fence with gates to match at accesses
Address: Arun District Council Depot and land adj to north fronting onto Fort Road Harwood Road Littlehampton
Decision: Approve Cond **Date:** 31-01-1979
Appeal Dec: **Date:**

Reference: LU/621/78
Description: Change of use of land from existing casual grazing to a vehicle park as an extension of ADC depot on to Fort Road
Address: Land north of A.D.C. Depot Fort Road Littlehampton
Decision: Approve Cond **Date:** 31-01-1979
Appeal Dec: **Date:**

Reference: LU/665/80
Description: Extension to existing stores to form carpenters workshop
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Approve Cond **Date:** 21-01-1981
Appeal Dec: **Date:**

Reference: LU/665/80/B
Description: Extension to stores to form carpenters workshop
Address: Harwood Road Depot Harwood Road Littlehampton
Decision: Permitted **Date:** 02-02-1981
Appeal Dec: **Date:**

www.neaviaPDF.com

SITE HISTORY

APPLICATIONS FOR SITE REFERENCE LU-665-80

Reference: LU/70/85
Description: Fencing of land and hardening approx 180 sq metres for depot vehicle parking due to lost area by other development
Address: Land in Harwood Road Forming Part of Arun District Works Depot Harwood Road Littlehampton
Decision: Approve Cond **Date:** 13-03-1985
Appeal Dec: **Date:**

Reference: LU/78/85/BR
Description: Relaxation of Building Regulation E9(3) Compartment w walls and compartment floors
Address: Land Forming Part of Harwood Road Works Depot Littlehampton
Decision: **Date:** 04-03-1985
Appeal Dec: **Date:**

www.neeviaPDF.com

Appendix D BGS Borehole Logs.

www.neeViaPDF.com

© Terragen Environmental Consultants 2011

GROUND EXPLORATIONS LTD.

BOREHOLE NO. 18

Contract Name LITTLEHAMPTON. Report No. 4412/SJK.

Client West Sussex County Council. Site Address

Address County Surveyor's Department, Littlehampton,

County Hall, West Sussex.

Chichester, Sussex.

Standing Water Level 7' 0" Method of Boring Shell/auger.

Water Struck 13' 0" Diameter 6 ins.

Ground Level 9·09 Start 18.6.68. Finish 18.6.68.

Remarks

JARS		CORES		BULK	
2543	1' 6"	2544	3' 6"		
2545	7' 0"				
2546	10' 0"				
2547	12' 0"				
2548	15' 0"				
2549	18' 0"				
2550	20' 0"				
2551	Water				

Description	Thickness	Dep
Topsoil	1' 0"	1' 0
Firm brown sandy clay and flints	2' 0"	3' 0
Firm brown chalky clay with flints	8' 0"	11' 0
Chalk	9' 0"	20' 0

www.neeviaPDF.com

TQ 0253 0220

332/35 Electricity Works, Oake Street, Littlehampton. (Disused)

B.S.Sr. III, p. 147. Surface +15. Lining tubes. 40 ft. from surface.
S.W.L. +6. P.W.L. -11. Yield 3,000 g.p.h. Date, 1932.

Drift	...	...	...	21	21
SC	...	...	...	79	100

Dpl { Clay & gravel 12 12
Marl 5 17
Gravel 4 21

Upper chalk 79 100

www.neeviaPDF.com

ALL BORING at Littlehampton Town

Geol. map ? 1/2 in. map New Series 352 1/4 in. map

Made by D. & E. Operations Date 1959

Sunk Feet Bored 2/160 Feet

Communicated by D. & E. Operations

Height above Ordnance Datum Rest level of water 15' O.D.

Yield

Quality (with analytical analysis on separate sheet)

TQ 0285 0220

GEOLOGICAL FORMATION.	NATURE OF STRATA.	THICKNESS. Feet.	Inches.	DEPTH. Feet.	Ins.
Drift	Gravel - Yellow sandy	2	—	2'	
	Gravel — grey	8	—	10'	
Upper Chalk	Chalk white	19	—	170.	

Now Enclosure 3 Plan & Sections

Geological Notes

See "Geological Notes."

Published in

'Wells & Springs of Sussex,'

page 147.

303. Elementary Works, ½ mile N. of lighthouse. 1922. Ht. above O.D. 15 ft. (Mr. [illegible])

		Thickness	Depth
		Ft.	Ft.
Drift	Sand and gravel	18	18 (Pleistocene)
Upper Chalk	Chalk and flints	3	21 (Upper Chalk)
	Gravel	4	25 (Upper Chalk)
	Chalk and flints	29	100 (Upper Chalk)

Dug; W. 12 ft. down. Depressed to 30 ft. when pumping 3,000 g.p. hour.
Bored; W. 100 ft. taken to 60 ft. Information from Messrs. Dicker and Operations, Ltd.

Closed & capped 1958

Pump removed 1/12/58 20 H.P. Super Ajax type CUG, 2 stage Driving unit petrol Ruston 10 H.P. Type 2VEA

Will possible for R.W.C. mains. Visited 19.10

DATA Book

* Geological Survey and Museum.

www.neviaPDF.com

BGS

BORETHOLE RECORDS

ADJUSTMENT FORM

QUARTER SHEET TQ00SW

BH REGISTRATION NUMBER 209 - 225

RECORDS ENTERED AND HELD BY WALLINGFORD

BH REGISTRATION NUMBER(S)

www.neviaPDF.com

332/92 South Eastern Gas Board, Gas Works, Clengers Rd, Littlehampton

TQ 0219 0246

Surface 22. Lining (shaft): 12 × 6 in from surface; 18½ × 9 in from 10ft down (perforated). S.E.G.B. 3. Route, 1937.

Enquiry. Oct. 1937.

Drift	...	...	...	9"	7½
Ex	...	...	...	22½	20

Drift 9½ Clay + flints 9½

Ex 22½ Chalk + " 20

www.neeviaPDF.com

RECORD OF WELL (SHAFT OR BORE)

At On Wide Strip Land

Town or Village Littlehampton

County Sussex Six-inch quarter sheet 63 SW 10

For Mr. Rufus Isaac Walker & Co

Exact site of well On Strip Land by Canal

TQ 021 (?) 031 (?)

(Attach a tracing, a map, or a sketch map, if possible)

Level of ground surface above sea-level (O.D.) ..... feet.

Is well-top at ground level? ..... If not, state how far above (or below) ..... feet.

Shaft ..... ft., diameter ..... ft. Details of lining .....

Bore 32 ft.; diameter of bore: at top ..... ins.; at bottom ..... ins.

Lengths, diameters, perforations, etc., of lining of bore 12" dia. for upper 15'

6" dia. for 17' 0" below

Water struck at depths, below well-top, of (feet) .....

TEST DETAILS — Month ..... Year .....

Rest-level of water ..... ft. above/below well-top. Suction at ..... ft. Yield on ..... hours' pumping ..... gallons per ..... (max. capacity of pump ..... g.) with depression of ..... feet. Recovery to ..... in ..... mins./hours.

WORKING CONDITIONS

Rest-level of water in ..... (month) ..... (year) ..... ft. above/below well-top

Working level in ..... in ..... (month) ..... (year) ..... ft. above/below ...

Working level in ..... in ..... (month) ..... (year) ..... ft. above/below ...

Suction at ..... ft. Rate of pumping ..... gals. per ..... for ..... hours per ...

with average depression of ..... ft. Recovery to ..... in ..... mins./hours

Quality of water (attach copy of analysis if available) .....

Well made by Dove Date of well 1933

Information from Owner (Mr. Walker, per Mr. W.)

ADDITIONAL NOTES.

Hand pump.
Dug 1911.
Lined with 6" dia. Stoneware pipes 63SW-W.
W 18-10-57.

www.neeviaPDF.com

Geological Classification	NATURE OF STRATA If measurements start below ground surface, state how far...	Thickness Feet	Inches	Depth Feet	Inches
Topsoil	Clay + flints				
Upper Chalk	Chalk + flints				

DATA Bank

www.neeviaPDF.com

Appendix E Photographic Record.

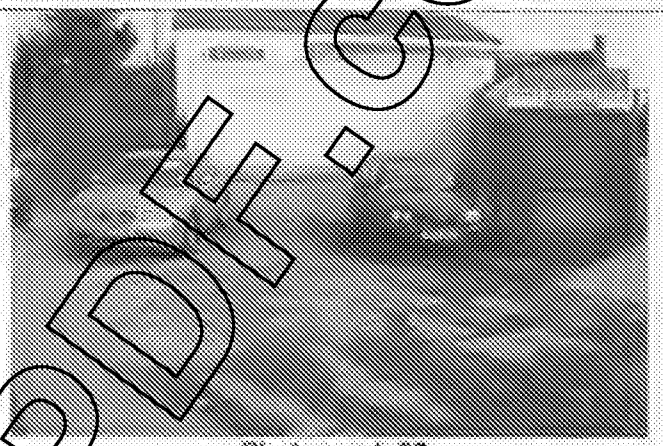
www.neeviaPDF.com

© Terrapin Environmental Consultants 2011

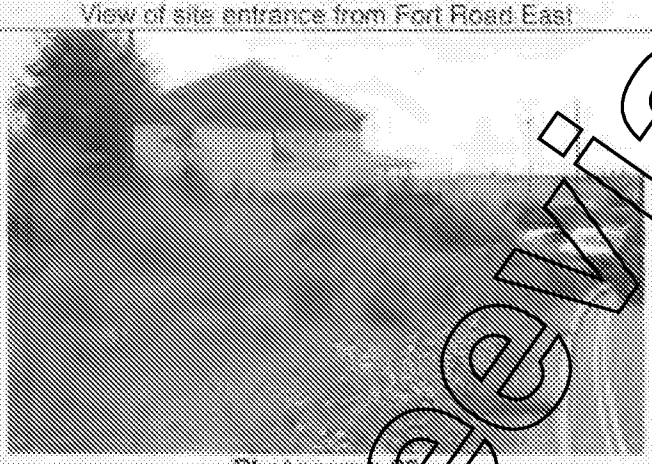
Fort Road Garage, Fort Road East, Littlehampton, West Sussex, BN17 7QZ – Photographic Record



Photograph 01
View of site entrance from Fort Road East



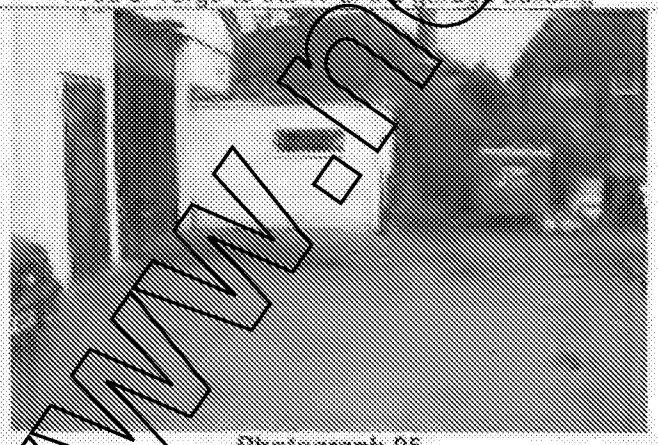
Photograph 02
Car parking to the W of site entrance



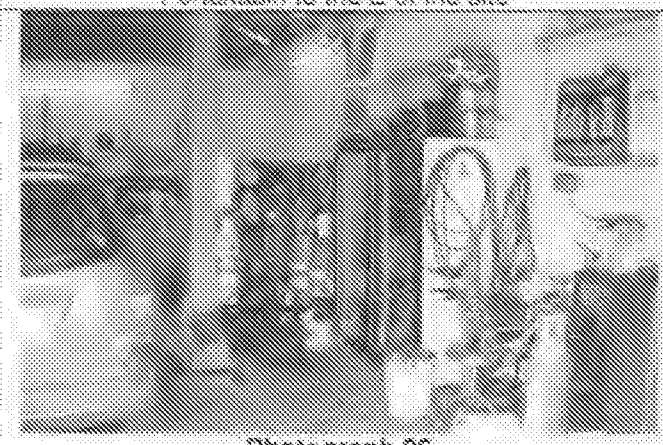
Photograph 03
Area of verge to the W of the garage building



Photograph 04
Portakabin to the E of the site



Photograph 05
View of the entrance and office



Photograph 06
General internal view of the mechanics building

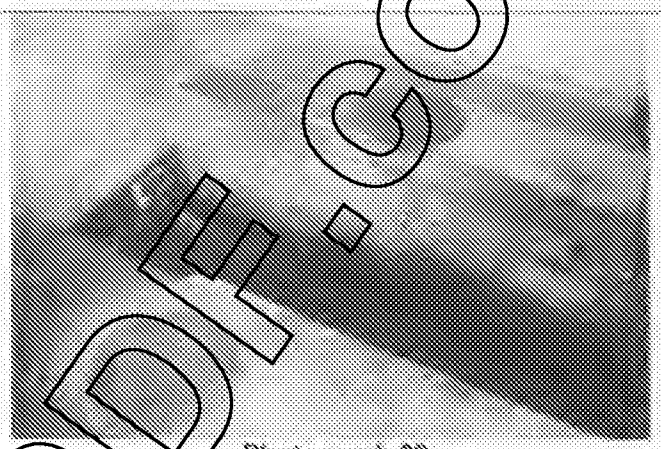
www.ePlan.com

© Terrapin Environmental Consultants 2011

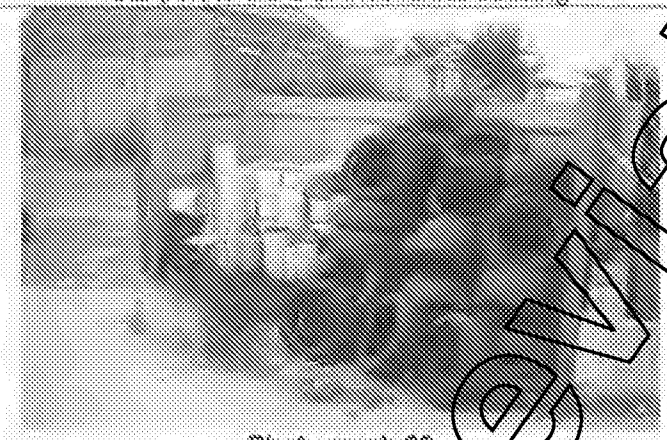
ARUN DISTRICT COUNCIL LU/303/14/PL



Photograph 07
Car port to the S of mechanics building



Photograph 08
Vehicle inspection pit.



Photograph 09
Tyres stored on raised concrete platform



Photograph 10
Hard-standing to NE of site used for vehicle parking



Photograph 11
Vehicle parking to the NE of the site



Photograph 12
Lower groundfloor/basement room used for tyre storage

www.neetaDL.com

© Terragen Environmental Consultants 2011

N DISTRICT COUNCIL LU/363/14/PL